[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live" \t "psplayer)

[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live)

[This is Glenn Berry with SQLskills. com.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=0) [I'm recording this course for Pluralsight,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=2.88235294117647) [and this is SQL Server: Scaling SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=5.352941176470589) [2012 and 2014: Part 2, and this is the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=8.866666666666667) [introductory module. Well this course as a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=13.066666666666668) [whole is instance-level scalability with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=15.875) [SQL Server, and there are several](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=17.75) [components to this scalability that we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=20) [need to think about as we go through the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=21.5) [course. First, you really want to know](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=23.75) [your workload that you're using with SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=26.142857142857146)[Server. Is it more of an OLTP workload, or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=28.64285714285715) [more of a reporting workload, or some sort](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=31) [of a mix workload. You also need to think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=33) [about and understand, are you using any](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=35.57894736842106) [kind of DR or HA technologies that can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=37.78947368421055) [affect your workload. The next part is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=40.375) [knowing your infrastructure, knowing what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=43) [kind of hardware you have, what kind of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=44.875) [storage subsystem you have, are you using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=47.764705882352935) [virtualization or not, and understanding](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=50.235294117647044) [how that affects SQL Server and how it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=52) [going to scale at the instance level.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=54.666666666666686) [Next, you need to understand how SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=57) [Server uses your infrastructure. So you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=59.54545454545457)[going to have your regular workload, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=61.55555555555556) [example, that, again, could be an OLTP](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=63.50000000000001) [workload or a reporting workload, plus you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=65.44444444444441) [might have HA/DR workload on top of that,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=67.57894736842103) [plus you're going to have things like](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=70.10526315789467) [maintenance workload, so running DBCC](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=72.46666666666667) [CHECKDB, doing index maintenance, things](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=74.80000000000001)[of that nature are also going to have an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=77.13333333333335) [effect on your infrastructure, on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=80.66666666666664) [VMs, for example, on your physical hardware, and on your storage subsystem.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=0&mode=live&start=82.66666666666661)

[What This Course Covers](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live)

[So what is this course actually going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=0) [cover? Well, we're going to build on the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=2.7855999999999996) [knowledge from part 1. Part 1 of this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=5.5712) [series focused more on application-level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=8.375764705882354) [issues that affected SQL Server, and what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=10.140470588235297) [you could do to detect and alleviate those](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=12.611058823529419) [issues. This is going to focus much more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=15.434588235294122)[intently on instance-level performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=18.25811764705882) [considerations, things that affect your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=19.873090909090905) [instance-level performance and your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=22.14581818181817) [machine-level performance. We're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=23.964) [look at operating system and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=26.047333333333338) [instance-level configuration settings in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=28.130666666666677) [great detail to make sure that's set up](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=29.691272727272725) [correctly. We're also going to look at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=32.60036363636364) [hardware and storage considerations, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=34.54294736842105) [make sure you've got the right kind of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=35.858736842105266) [hardware for your workload, and that your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=37.964)[storage is configured properly and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=40.589) [performing as it should. We're also going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=42.464) [to introduce some troubleshooting](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=45.163999999999994) [techniques you can use to detect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=46.76399999999999)[performance issues and hopefully start to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=49.16399999999998) [alleviate them at the instance level. I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=51.22715789473685) [expect you to have a basic knowledge of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=53.437684210526335) [database server terminology as you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=55.964) [going through this course. Also, this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=58.18622222222221) [course really applies to all editions of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=60.63066666666667) [SQL Server from 2005 onward, but it's most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=62.96400000000002)[relevant for 2012 and 2014. Other things](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=65.63066666666667) [that can influence performance at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=69.1404705882353) [instance level include things such as your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=72.3169411764706) [database server hardware and your overall](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=75.55223529411765) [storage infrastructure, so we'll spend](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=77.3169411764706) [quite a bit of time talking about both of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=78.78752941176474) [those subject areas, things such as](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=82.464) [incorrect operating-system-level settings,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=85.464) [instance-level settings, and even](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=86.964) [database-level configuration settings can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=88.39257142857144) [have a big effect on your performance and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=89.82114285714289) [scalability, so we'll talk about all of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=92.66988235294119) [those. Also, having the hardware just set](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=95.14047058823535) [up incorrectly with incorrect BIOS](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=97.6110588235295) [settings, for example, and things that are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=99.464) [wrong with your storage subsystem can have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=102.089) [a big effect on scalability at this level,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=104.55223529411765) [and so we'll be talking about that. Also,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=106.90517647058826) [we'll talk about determining when it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=109.33242105263157) [time to actually scale up or scale out,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=111.54294736842103) [and talk about some techniques to do that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=114.49031578947363) [once you've exhausted what you can do on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=117.29733333333331) [your current instance, on the current](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=119.96399999999994) [hardware that it's running on. Then some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=121.964) [other points to bear in mind as you go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=124.41399999999996) [through this, truly scalable database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=127.56399999999991) [servers don't just happen by accident.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=129.31694117647058) [Somebody, hopefully you, is going to go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=131.43458823529406) [through at every level, from your storage,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=133.90517647058812)[through your hardware, through your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=136.39257142857144) [operating system, through your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=138.17828571428575) [instance-level settings and your database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=139.6068571428572) [properties, and make sure that everything](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=141.29733333333337) [is set up correctly to get the best](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=143.29733333333343) [performance and scalability. So some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=145.964) [configuration settings are really, really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=148.10685714285708) [important, and we're going to spend a lot](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=150.24971428571416) [of time talking about them and showing you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=152.87309090909088) [how to set them correctly so you get the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=154.69127272727263) [best performance possible from your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=156.7367272727271)[hardware. It's also really important to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=158.83066666666667) [consider the entire database server as a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=161.63066666666668) [system with those different layers that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=164.69127272727275) [can affect scalability. It's really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=166.873090909091) [common, I think, for DBAs just to focus on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=168.664) [query tuning, for example, and not really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=171.81399999999994) [think about how their storage subsystem is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=174.2639999999999) [performing or how their hardware is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=176.35288888888886) [performing, and I think that's a mistake.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=178.01955555555548) [You're closer to the hardware as a DBA](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=179.964) [than, for example, developers are, so I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=182.49031578947375)[think it's your responsibility to think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=184.7008421052633) [about all the layers of the system. What](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=186.8528888888889) [we're not going to cover in this course,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=190.22715789473685) [it's not going to be a course on query](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=192.33242105263164) [tuning. It's also not going to be a course](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=194.7008421052633) [on how to write or rewrite your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=197.24971428571422) [application-level code, it's not going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=199.24971428571416) [show you how to rewrite your client or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=200.964) [middle-tier applications to get better](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=203.8211428571429) [performance. Part 1 covers some of that,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=205.6068571428572) [but this does not get into that at all.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=207.96400000000006) [Now it's also not going to be a course on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=210.964) [indexing or statistics. My colleague,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=213.27169230769226) [Kimberly Tripp, has several courses on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=214.714) [Pluralsight that go into those subjects](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=216.964) [very deeply, and I recommend that you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=219.214) [watch those. It's also not going to be a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=221.35288888888886) [course on application development, there's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=223.8528888888888) [lots of really good courses on Pluralsight](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=225.29733333333334) [that talk about that. This is focused on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=227.63066666666674) [SQL Server instance-level performance and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=230.964) [scalability. And then finally, it's not a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=233.464) [course on how to detect application-level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=236.5354285714285) [performance issues. A lot of that was covered in part 1 of this series.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=1&mode=live&start=239.106857142857)

[Course Structure](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live)

[So what order should you watch the courses](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=0) [that are related to this subject matter?](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=3.053866666666667) [Well I think you should try to watch them](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=5.726) [in this order. First you should watch SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=7.868857142857143) [Server: SQL Server 2012: Installation and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=9.773619047619043) [Configuration, because that's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=11.392666666666669) [show you how to properly install and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=13.059333333333338)[configure SQL Server 2012, and it's also](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=15.392666666666676) [applicable to SQL Server 2014 because](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=17.620736842105256) [there were very few changes in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=19.51547368421051) [installation between those two versions.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=21.726) [The next one I think you should watch is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=23.19658823529411) [SQL Server: Scaling SQL Server 2012-Part](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=25.843647058823514) [1, which is the introductory part of this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=28.125999999999994) [course that covers application-level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=31.859333333333314) [performance issues and how to detect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=33.726) [performance bottlenecks at that level. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=36.45327272727272) [then finally you should watch this course,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=38.96129411764706) [and it's going to cover database and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=40.60835294117646) [instance configuration issues along with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=42.25541176470587) [your storage and hardware issues and how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=44.0385) [to scale up and scale out. Then, how is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=47.101) [this course structured, and what's the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=50.97599999999999) [focus of it? Well, module 2 is going to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=53.47599999999998) [Database Configuration Settings, that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=56.72599999999999) [the next module. Module 3 is going to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=57.86885714285713) [Instance-level Configuration Settings,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=61.95676923076924) [then Storage Subsystem Issues. Module 5](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=63.57215384615386) [will be Hardware Issues, and module 6 will](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=66.36236363636363) [be about how to scale up SQL Server and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=68.90781818181813) [how to migrate from one version to another](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=71.77145454545445) [and from older hardware to newer, bigger](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=74.64907692307693)[hardware. Module 7 is going to show you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=77.34138461538464) [how to scale out SQL Server, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=79.55208695652173) [module 8 will cover some of the new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=81.63904347826086) [scalability features that were added in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=83.726) [SQL Server 2014, features in the product](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=85.84364705882356) [that actually help you scale out. Then you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=88.31423529411772) [should consider watching all of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=90.98915789473682) [components of this course in order to get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=92.88389473684205) [the most out of it, that's what I think at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=95.4102105263157) [least. Finally, what did we cover in this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=99.32600000000005) [module? Well, I talked about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=102.351) [instance-level performance tuning in SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=104.226) [Server and how important that is to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=106.0417894736842) [address all the different layers that you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=108.25231578947364) [have in a database server system. We did](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=110.46284210526308) [talk about what the course does and does](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=112.726) [not cover, and then we went over the course structure.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m1&clip=2&mode=live&start=114.726)

[Database Configuration Settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live)

[Database Configuration Settings. This](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=0) [module is going to cover key database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=5.294117647058823) [property settings that are really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=7.352941176470587) [important for performance and scalability.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=8.823529411764707) [We're also going to talk about things you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=10.3125) [need to do with database filegroup](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=12.8125) [considerations, as far as having](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=14.6875) [additional filegroups and additional data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=16.599999999999998) [files. We're also going to talk about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=18.59999999999999) [where to layout your files and how to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=20.5) [think about that from a performance and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=22.5) [scalability point of view. Then we'll talk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=24.352941176470587) [about database file property settings and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=26.823529411764696) [how they relate to performance and scalability.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=0&mode=live&start=28.941176470588218)

[Statistics-related Database Properties](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live)

[Statistics-related Database Properties.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=1.867) [There are certain properties that you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=3.0455714285714284) [at the database level that are related to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=5.79557142857143) [statistics that we need to think about for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=8.567) [performance and scalability. The first one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=10.967000000000006) [is auto create statistics. Now this one is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=12.767000000000003) [on by default, and in my opinion you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=15.167000000000009) [should leave it on in most cases. What](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=17.567000000000014) [this means is when you create a new table](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=19.967000000000006) [it's going to create the indexes as the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=22.667000000000012) [table is created, and as the data is added](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=24.91963157894737) [it's going to automatically create the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=27.288052631578953) [statistics that you need, and in most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=28.867) [cases I think you should leave this turned](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=30.617) [on, which is a default. The next one you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=32.617) [want to think about is auto create](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=35.13015789473685) [statistics incremental, and this is a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=37.340684210526334) [newer property, and this has to do with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=39.23542105263161) [when you have partition tables. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=41.53366666666667) [partition tables are an enterprise edition](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=43.20033333333334) [only feature, so if you have enterprise](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=44.867) [edition and you know you're going to have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=47.077526315789484)[large tables, and you end up going in and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=49.60384210526318) [actually partitioning those tables, then I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=52.117) [think it's a good idea to turn on this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=53.617) [setting also. Then the automatic creation](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=55.867) [of the statistics will be done at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=58.117) [partition level. That's why it's called](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=61.117) [auto create statistics incremental. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=62.97811111111111) [the next one you want to think about is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=64.36699999999999) [auto update statistics, and this is on by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=66.867) [default, and I think, again, in most cases](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=69.66699999999996) [you want to leave this on because this way](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=72.46699999999991)[as the data changes in the table your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=75.81144444444443) [statistics will be automatically updated](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=78.92255555555552) [once you get to a certain threshold of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=80.867) [changes in the table, and by default](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=83.15271428571434) [that's 20% of the rows in the entire table](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=85.15271428571438) [have to have been changed before auto](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=87.93842857142859) [update statistics kicks in. Now there's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=90.43842857142862) [actually a trace flag called 2371 that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=92.64477777777778) [lowers that threshold, and that can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=95.36699999999998) [actually be very helpful for many large](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=97.70033333333329) [tables, but by default it's the 20% and so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=100.25830434782607) [you want to have this turned on in most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=103.38873913043471) [cases. The edge case where you don't want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=106.51917391304336) [to have it turned on is maybe you've got a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=108.77609090909087) [table that is so volatile that auto update](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=111.50336363636353) [kicks in at inopportune times and you want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=113.86699999999999) [to do your own manual statistics updating](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=116.53366666666662) [with agent jobs, but not too many people](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=118.867) [are in that situation. Finally, the last](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=121.26699999999998) [one that I think you should turn on even](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=123.36699999999996) [though it's turned off by default, is auto](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=126.46700000000003) [update statistics asynchronously. And what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=129.66700000000006) [this does is normally when you have an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=131.6905294117647) [auto update statistics event it's done](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=134.98464705882347) [synchronously, and what that means is that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=137.45523529411756) [it waits for the new statistics to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=139.50336363636367) [created before it can use them, and so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=141.68518181818192) [query execution that uses those statistics](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=143.867) [can halt for a while, while it's building](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=146.117) [those statistics synchronously, while auto](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=149.117) [update statistics asynchronously creates](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=151.48238461538463) [new statistics in the background and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=153.63623076923082) [continues to use the old ones while the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=156.867) [new ones are being built, and so for most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=159.39331578947375) [workloads, especially OLTP workloads,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=162.23542105263172) [you're better off with auto update](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=163.867) [statistics asynchronously. Now one edge](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=166.867) [case where this might not be the best idea](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=168.72414285714282) [is if you had a workload with really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=171.29557142857132) [long-running reporting queries and these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=173.58128571428554) [queries might take much, much longer with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=175.73366666666666) [out-of-date statistics than they would if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=179.00033333333334) [you had up-to-date statistics, so in that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=181.53366666666668) [case you might be willing to pay the price](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=183.86700000000008) [to make sure that your statistics were up](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=186.86700000000016) [to date rather than using the out-of-date](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=189.25588888888885) [ones, but in that situation you might just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=191.20033333333325) [be better off to do more frequent manual](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=193.5812857142857) [updating of your statistics. So, anyways,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=196.4384285714286) [I still think auto update statistics](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=199.867) [asynchronously is a good idea for most workloads.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=1&mode=live&start=205.867)

[Recovery Model and Compatibility Level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live)

[Recovery Model and Compatibility Level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=2) [Settings. SQL Server has three different](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=4.358571428571428) [recovery models available. You have the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=7.188857142857141) [full recovery model, the bulk-logged](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=9.804) [recovery model, and the simple recovery](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=11.804000000000002) [model. Now in most cases what recovery](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=14.204000000000004) [model you use is going to be determined by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=16.81452631578947) [your HADR requirements, and specifically](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=20.13031578947368) [your RPO, Recovery Point Objective](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=22.003999999999998) [requirements. So if you've got a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=24.00399999999999) [production database with a 15-minute RPO,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=26.403999999999982) [you're probably going to want to use the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=28.504) [full recovery model so you can meet that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=30.904000000000007) [RPO requirement. But there are some other](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=33.303999999999995) [cases where you might want to use a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=35.368705882352955) [different recovery model, so for example,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=37.721647058823564) [if it's a development or test database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=39.654) [that you don't really care that much about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=42.10400000000001)[the data, and you don't have to worry](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=44.904000000000025) [about taking transaction log backups, you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=47.182947368421054) [want to use the simple recovery model. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=48.76189473684211) [then bulk-logged is actually not used that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=50.903999999999996) [often, but what it's meant to do is it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=53.00399999999998) [lets you switch from full to bulk-logged](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=55.70399999999995) [when you know you're going to do certain](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=58.15955555555554) [kinds of bulk insert operations that can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=61.27066666666663) [potentially be minimally logged, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=63.992888888888885) [that will let you minimize the size of how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=66.3262222222222) [much transaction log is used by those](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=69.82622222222217) [operations. Now there's not that many](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=72.36870588235297) [operations that can be minimally logged,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=74.48635294117653) [and then the other problem is, if you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=76.604) [using certain kinds of HA technologies](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=78.82622222222217) [such as database mirroring or \_\_\_\_\_](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=80.4928888888888) [availability groups, you can't switch from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=82.5130909090909) [full to bulk-logged. And so from a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=85.24036363636363)[performance point of view there's not that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=87.71511111111109) [much difference between these three except](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=89.65955555555549) [that bulk-logged can help in some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=91.32622222222211) [situations where you would normally run in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=93.27066666666664) [full, but outside of that you're still](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=95.60399999999994) [writing essentially the same amount of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=97.89811764705883) [information to the transaction log no](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=99.66282352941178) [matter what you're doing unless it's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=101.42752941176474) [minimally-logged operation. So the next](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=103.48635294117648) [thing you need to think about is your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=104.95694117647061) [compatibility level, and this is going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=107.30988235294122)[depend on what version of SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=109.60399999999997) [you're using. And in the past this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=111.93733333333327) [compatibility level, which you can change](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=114.44610526315788) [up and down anytime you want to basically,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=116.65663157894733) [it's different from the version level of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=119.604) [your files which get upgraded one time and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=121.81452631578944) [there's no going back, this is different,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=124.34084210526308) [and so in the past this is really meant to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=126.55854545454544) [turn on and off certain new features in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=129.74036363636358) [new versions of SQL Server. And the reason](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=132.2858181818181) [why people might leave it at an older](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=134.44610526315796) [compatibility level is that they didn't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=136.55136842105276) [have time to do enough testing on their](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=138.23557894736845) [application, and maybe there was a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=140.7618947368422) [breaking change in the newer version of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=142.65663157894753) [SQL Server, so using the old compatibility](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=144.6566315789474) [level helped them get around that on a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=146.49873684210536) [temporary basis. But now things are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=148.604) [different with SQL Server 2014. You've got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=151.93733333333338) [the 120 compatibility level, and not only](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=154.27066666666678) [does that turn on and off some features,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=156.604) [but more importantly what it can do is it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=159.0040000000001) [enables the new cardinality estimator that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=161.7040000000002) [was added in SQL Server 2014. Now that new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=163.729) [cardinality estimator in most cases gives](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=167.104) [you better performance, but there's a few](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=169.30988235294117) [cases where it gives you much, much worse](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=171.78047058823523) [performance, so you really need to do some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=174.604) [thorough testing of your applications](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=176.9569411764705) [before you decide to use this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=178.42752941176457) [compatibility level, and you can override](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=180.40400000000002) [this new cardinality estimator behavior](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=182.80400000000006) [with trace flags and with query \_\_\_\_\_ at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=184.8040000000001) [the individual query level, besides doing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=187.60400000000007) [it at the database level with this 120](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=189.60400000000013) [compatibility level setting. Then for SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=192.53733333333335)[Server 2012 you've got 110 compatibility](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=195.33733333333336) [level, and again, that acts like the older](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=198.13733333333337) [ones where really all it does is turns on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=200.7040000000001) [and off certain functionality. And then if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=203.4040000000002) [you've got older versions of SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=205.40400000000005) [you can use lower levels. So, again, the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=207.2706666666668) [important thing to remember here is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=209.47242105263157)[whether or not you're on 120 or higher](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=211.2092631578947) [because that turns on and off the new cardinality estimator.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=2&mode=live&start=213.52505263157886)

[Undesirable Database Properties](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live)

[Undesirable Database Properties. There are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=1.712) [certain database level properties that you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=3.676285714285714) [really should never mess with, you should](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=6.033428571428574) [leave them at their default values in most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=8.75046153846154) [cases. One good example is the AUTO\_CLOSE](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=11.82738461538462) [property. This is a database level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=14.106736842105263) [property that what it does is that when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=16.001473684210527)[there's no more connections to a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=18.587) [particular database it basically shuts](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=20.837) [down the databases and releases the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=22.712) [resources that that database was using.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=24.843578947368417) [And this might seem like a good idea at a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=26.73831578947367) [conceptual level, but the cost of spinning](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=29.89621052631576) [that database back up and having to load](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=32.012) [that data back into memory that it was](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=34.41199999999998) [using, and reopening connections and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=37.278666666666666) [recompiling query plans, far outweighs any](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=39.94533333333332) [benefits from releasing those resources.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=43.14533333333331)[And, again, this is turned off by default,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=45.337) [but occasionally people will go poking](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=48.337) [around and looking at database settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=50.48977777777778) [and turn this on because they think it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=52.15644444444445) [going to help performance, and it actually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=54.37866666666668) [hurts performance, so please never, never](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=57.05815384615384) [turn this on. Another one that you should](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=59.8273846153846) [never turn on in my opinion is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=62.750461538461536) [AUTO\_SHRINK. Now whenever you shrink a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=64.90430769230768) [data file in SQL Server it causes severe](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=67.31726315789473) [index fragmentation, plus it's a very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=70.68568421052629)[resource-intensive operation. And manually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=73.212) [shrinking data files might be justified in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=75.36584615384614) [certain cases, so if you delete a whole](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=79.13507692307687) [bunch of data from your database and you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=81.77721739130435) [know that data is not coming back for a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=83.86417391304347) [long time, if ever, then it might be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=86.212) [justified to manually shrink that data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=89.41200000000005) [file and then go in and reorganize all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=91.81200000000008) [your indexes because you know they're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=94.1564444444444) [going to get heavily fragmented from doing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=95.82311111111103) [that, so I can see doing that in that kind](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=97.812)[of a scenario, but having AUTO\_SHRINK](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=100.81199999999997) [turned on means that basically any time](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=102.61199999999995) [that SQL Server notices that there's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=104.52778947368418) [decent amount of free space in your data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=106.36989473684203) [files, it can just kick off a shrink](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=108.53018181818182) [operation any time it wants to, and that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=111.07563636363632) [could be at a very inopportune time, so it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=113.62109090909082) [can affect performance during the day,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=116.462) [plus you're causing all this index](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=118.337) [fragmentation, and you can get in this bad](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=120.212) [circle of AUTO\_GROW happens and then you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=123.32311111111109) [have an AUTO\_SHRINK happen and they're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=126.04533333333329) [fighting each other, so it's a really bad](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=128.0014736842105) [setting that I really wish that they would](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=130.1067368421053) [take out of the product, there's no reason](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=132.212) [whatsoever to ever use this. Now the next](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=134.67353846153856) [one is TARGET\_RECOVERY\_TIME, and that's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=137.47515789473687) [new database property that they added in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=140.00147368421062) [SQL Server 2012. And that lets you change](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=142.94884210526334) [to use what are called indirect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=145.8786666666667) [checkpoints for individual databases so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=147.87866666666676) [you can set a recovery time either in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=149.54533333333347) [seconds or minutes to try to alter how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=153.3884705882353) [checkpoints are occurring. And generally](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=157.62376470588237) [speaking, you really don't want to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=159.68819047619047) [this. Setting it to anything but 0 is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=161.35485714285716) [usually going to cause extra disk activity](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=163.25961904761908) [because the lazy writer is going to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=165.412) [doing more flushes to disk to try to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=168.61200000000005)[maintain that target recovery time goal,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=171.8120000000001) [and that can actually hurt performance for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=173.9977142857143) [most people. And then finally the next one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=176.49771428571432) [is PAGE\_VERIFY, and that's a setting that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=179.73831578947375) [you can have set to CHECKSUM, TORN\_PAGE or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=182.68568421052646) [NONE, and depending on what version of SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=185.87866666666667) [Server that your database was created in,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=188.54533333333342) [you'll either have it set to CHECKSUM by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=190.87866666666682) [default, or if it was an older version of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=193.03808695652182) [SQL Server it will be set to TORN\_PAGE,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=195.38591304347847) [and that's where you often get databases](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=197.56494117647057) [that are still set to TORN\_PAGE because](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=200.03552941176463) [they were created in an old version of SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=202.5061176470587) [Server and then the database got upgraded](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=205.21199999999993) [to a newer version of SQL Server and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=207.21199999999988) [nobody ever bothered to change the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=209.56494117647057) [PAGE\_VERIFY option. Now, that's where it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=211.68258823529405) [happens here when you have the upgrades to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=213.80023529411753) [newer versions so you're still using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=216.66654545454548) [TORN\_PAGE\_DETECTION. And it's also](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=218.84836363636373) [possible that someone might have gone in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=220.44729411764703) [and changed the PAGE\_VERIFY option from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=223.32964705882347) [CHECKSUM to NONE, thinking it would](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=225.80023529411756) [actually help performance, and there's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=227.8786666666667) [been some testing done on that, and the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=229.54533333333342) [amount of performance that is affected by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=232.212) [this option is really minuscule, and the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=235.5061176470588) [safety of having PAGE\_VERIFY in place,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=238.8002352941176) [which will help you detect corruption](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=241.712) [earlier, far, far outweighs the very tiny](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=244.712) [performance impact of having PAGE\_VERIFY](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=248.212) [set to CHECKSUM. So, again, make sure you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=250.087) [have all your databases set so their](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=253.087) [PAGE\_VERIFY option is set to CHECKSUM, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=255.47515789473687) [if it's set to another value like NONE or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=257.6856842105264) [TORN\_PAGE\_DETECTION, just changing to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=260.61199999999997) [CHECKSUM doesn't fix the problem by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=262.2119999999999) [itself, you actually have to go through](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=264.61199999999974) [and write all the data before all the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=267.4977142857143) [CHECKSUMs are generated. So an easy way to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=270.9262857142859) [try to do that is to do something like](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=273.4024761904762) [reorganize all your indexes or rebuild](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=275.54533333333336) [your indexes over time, or just wait for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=276.9739047619048) [enough data to change so that all the CHECKSUMs get generated.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=3&mode=live&start=284.212)

[Miscellaneous Settings to Consider](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live)

[Miscellaneous other settings to consider](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=2) [when it comes to database properties. The](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=3.7140909090909084) [first one I want to talk about here is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=6.048777777777778)[DATE\_CORRELATION\_OPTIMIZATION, and this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=8.548777777777778) [a setting that you can use, especially for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=9.659888888888892) [data warehouse workloads, but it's sort of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=12.521) [restrictive because what you actually have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=15.5835) [going on here is you need to have a lot of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=18.15195238095238) [date information being used in your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=22.342428571428556) [primary keys, and you have to have a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=24.628142857142834) [foreign key relationship between both](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=27.086789473684213) [tables that are going to be involved in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=28.402578947368426) [this. So, for example, if you've got an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=30.507842105263165) [orders table and an order details table](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=32.870999999999995) [and you want to do something where you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=34.970999999999975) [have a foreign key relationship between](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=37.54877777777777) [both tables, and both tables have a Date](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=39.88211111111109) [or Datetime column that you can use for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=42.99322222222217) [that and you're using that in a join, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=45.13463636363636) [also if you're using it as part of your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=47.1800909090909) [predicate for a query. If all those things](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=49.43766666666667) [are true, then if you turn on this setting](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=52.10433333333336) [at the database level you can get much](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=55.10433333333338) [better query performance for certain kinds](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=57.981526315789495) [of queries, but again, this is a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=60.19205263157899) [relatively unusual situation so not that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=62.771) [many people use this setting, but that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=64.871) [what it's about and how it works. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=67.32099999999996) [another one that might be more interesting](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=70.06511764705883) [to more people is the DELAYED\_DURABILITY](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=72.12394117647061) [setting that was added in SQL Server 2014,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=73.88864705882357) [and what this lets you do is basically](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=76.77100000000003) [trade the possibility of some data loss](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=79.97100000000007) [for increased performance, because instead](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=82.771) [of waiting for log flushes to occur before](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=85.271) [a transaction is considered fully](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=89.271) [committed, it writes it and acts as if it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=91.57100000000001) [had already happened, and so this can let](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=95.17100000000006) [you write transactions much more quickly,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=98.37100000000011) [and at the possibility of losing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=100.82982352941174) [everything since the last log flush. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=103.30041176470583) [this can be helpful if you're seeing lots](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=106.05671428571429) [of high write log waits and you can't do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=108.34242857142863) [anything else to increase the performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=110.91385714285725) [of where your transaction log is located,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=112.82982352941178) [but again, there is some possibility of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=115.30041176470594) [data loss here, so depending on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=117.771) [application you may just want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=119.98152631578944) [investigate doing other things such as](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=121.87626315789467) [moving your transaction log to a faster](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=123.771) [disk rather than playing with this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=126.77100000000002) [setting. The next one we want to talk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=129.34242857142854) [about is the PARAMETERIZATION setting for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=132.1043333333334) [the database. Now you've got two choices](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=134.10433333333344) [there, you've got simple parameterization,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=136.4376666666667) [which is the default, and you have forced](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=138.10433333333341) [parameterization. And there are some cases](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=141.0835) [where if you turn on forced](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=143.7085) [parameterization you can force more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=146.3335) [complex queries to have parameterization](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=149.021) [applied and have the query plans cached,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=151.8335) [and that can help, but you've got to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=155.771) [really go through and test your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=157.45521052631582) [applications because there's a lot of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=158.7183684210527) [cases where this will actually not help,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=160.15988888888887) [and for most people with most workloads,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=162.88211111111107) [the default simple parameterization works](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=165.60433333333327) [better than forced parameterization. The](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=167.521) [next one we want to talk about here is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=169.396) [REAC\_COMMITTED\_SNAPSHOT isolation, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=172.771) [this lets you use a non-locking based](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=175.12814285714282) [mechanism for tracking changes. So rather](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=180.62814285714276) [than having to take shared locks when you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=184.34242857142854) [do reads and having to worry about whether](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=186.62814285714276) [or not writers are blocking readers, which](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=188.91385714285698) [is the default with SQL Server when you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=191.10433333333336) [in READ\_COMMITTED isolation, you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=193.7710000000001) [switch over to this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=195.771) [READ\_COMMITTED\_SNAPSHOT isolation that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=197.771) [uses a version store in tempdb to track](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=199.271) [what's happening with the data as it goes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=203.0835) [through and is being changed by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=205.5835) [transactions. And so this is going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=207.4585) [eliminate or greatly reduce a lot of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=209.57100000000005) [locking and blocking issues that people](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=211.97100000000015) [often run into, but the cost of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=213.771) [READ\_COMMITTED\_SNAPSHOT isolation is that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=216.65335294117642) [it puts a much higher load on tempdb, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=218.3004117647058) [if you're going to use this you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=221.56047368421054) [make sure you're getting really good](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=223.92889473684218) [tempdb performance, and you might want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=225.50784210526328) [make sure you're using local flash storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=227.88864705882347) [instead of magnetic storage on a SAN, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=230.35923529411752) [example. Now the next thing we want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=232.8619090909091) [talk about here is, if you're going to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=235.04372727272735) [using Hekaton, which is in memory OLTP,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=237.49827272727288) [that's an enterprise-only edition feature](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=240.43766666666673) [that you can use to get much better](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=242.65988888888901) [performance for certain situations,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=246.23253846153844) [especially, again, with high insert rates](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=248.07869230769225) [where your transaction log is your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=250.84792307692297) [bottleneck. And if you're going to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=252.82363157894738) [that, you're going to have to make sure](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=254.66573684210533) [that you have a special filegroup in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=256.771) [database that's marked for use by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=261.0376666666669)[MEMORY\_OPTIMIZED\_DATA. And if you do that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=264.23766666666705) [you want to make sure that it's on a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=265.90736363636375) [dedicated LUN and dedicated spindles if at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=267.9528181818185) [all possible, and make sure that it can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=269.5437272727277) [really perform really well, because that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=272.1043333333332) [going to have a huge effect on how well](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=274.1043333333331) [Hekaton works, because you're going to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=277.1710000000001)[a lot more activity to the files that live](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=279.62100000000027) [in that filegroup, and that's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=282.771) [also come into play when you restart SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=284.98152631578955) [Server since all the data that's stored in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=287.5078421052633) [those files that's durable has to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=290.1043333333333) [loaded back off the disk into memory, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=292.4376666666665) [the sequential throughput that you get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=295.771) [there is going to have a big effect on your performance.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=4&mode=live&start=301.771)

[Demo: Checking Database Properties](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live)

[This is the query we're going to use to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=2) [check some key database properties for all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=4.038049999999998) [the databases on this instance. So when I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=5.623199999999997) [run this query that's going against sys.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=8.002684210526315) [databases, it comes back and shows me all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=10.581631578947366) [the databases on the instance, and then it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=13.529) [shows me Recovery Model,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=17.24328571428571)[containment\_description, Compatibility](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=19.100428571428573) [Level, and page\_verify\_option. And so if I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=20.029) [look at a more interesting database here,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=22.705470588235297) [we've got the AdventureWorksLT2008R2](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=25.381941176470594) [database, we see it's in the FULL recovery](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=26.99566666666667) [model, it's not a contained database, it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=30.729000000000017) [using the 110 compatibility level for SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=33.973444444444446) [Server 2012, so it's not using the new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=37.084555555555546) [cardinality estimator, we are in CHECKSUM](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=40.64011111111109) [for our page\_verify, which is what we want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=42.67185714285714) [to use. We've got auto\_create\_stats on and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=44.95757142857142) [auto\_update\_stats on, which are both good.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=47.34718181818184) [We've got auto\_update\_asyn turned on,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=49.529) [which is good in most cases. We don't have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=51.80172727272727) [auto\_create\_stats\_incremental on since we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=55.92900000000001) [don't have any partitioned tables in this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=57.79566666666668) [database. We're not using forced](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=61.06233333333336)[parameterization, and we are using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=63.682846153846164) [snapshot\_isolation, but not RCSI. Going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=66.37515384615384) [further over here, we don't have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=68.904) [auto\_close on or auto\_shrink on, which are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=71.154) [both good. The](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=73.779) [target\_recovery\_time\_in\_seconds is the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=74.88614285714286) [default value of 0, which is best in most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=75.95757142857144) [cases. We're not using change data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=79.17185714285719)[capture, this is not a publisher in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=81.58782352941174) [transactional replication, and we're not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=84.47017647058817) [using Hekaton here, and we're not using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=86.529) [delayed\_durability for this particular](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=90.029) [database. So this pretty simple query](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=92.029) [shows you a lot of very important database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=94.10794736842102) [properties for all of your databases, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=96.63426315789467) [you can quickly spot problems and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=98.779) [think about what you're going to do to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=100.529) [change some of these properties to more appropriate values.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=5&mode=live&start=102.529)

[Database Filegroup Considerations](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live)

[Database Filegroup Considerations. All SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=2) [Server databases have to have one data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=4.1140625) [file in the primary filegroup, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=7.07375) [you have to have a transaction log file.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=9.554473684210528) [And the problem is, most databases I see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=11.659736842105268) [out in the field, that's all they have,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=13.765) [they have one very large data file in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=16.291315789473686) [primary filegroup, and over time that file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=19.133421052631565) [gets larger and larger, and it becomes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=21.265000000000004) [harder to maintain, and you might run into](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=23.36500000000001) [some space issues on whatever LUN it lives](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=25.765) [in. And you also might run into](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=28.29131578947367) [performance issues if the LUN that that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=30.501842105263133) [data file lives on can't support your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=32.66499999999999) [workload. So what you can do to avoid that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=34.76499999999997) [issue when you first create your database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=37.46499999999995) [is get in the habit of creating a MAIN](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=39.265) [filegroup when you create the database and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=41.515) [make it the default filegroup. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=43.43166666666667) [what you want to do is create at least two](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=45.76500000000002) [data files in that main filegroup, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=49.09833333333338) [then when you do that, and this is the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=51.51500000000001) [default filegroup, then all the user](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=54.66500000000002) [objects such as tables and indexes and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=56.765) [other things will go into the main](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=59.712368421052616) [filegroup and you'll only have the system](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=62.65973684210523) [objects in a small file in the PRIMARY](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=65.60710526315789) [filegroup. And having at least two files](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=68.97552631578945) [per filegroup gives you more flexibility](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=71.92289473684207) [about where you're going to layout those](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=73.765) [files. So you may start off with both of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=75.515) [those files on a particular LUN, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=78.43166666666663) [later on, either for space reasons or more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=81.09833333333326)[often for performance reasons, you could](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=83.76499999999999) [detach the database and then move one of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=85.76499999999996) [those data files to a different LUN and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=88.43166666666659) [reattach the database. Or an even safer](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=90.76500000000004) [method would be to take a full backup and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=92.76500000000009) [restore, so that you can do that and move](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=95.43166666666666) [the files when you do the restore. But](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=98.43166666666662) [doing this now, when you first create the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=101.0807894736842) [database, gives you a lot more flexibility](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=103.60710526315785) [to make those kinds of changes later. If](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=105.81763157894729) [you didn't do that, like most people do,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=108.26499999999999) [you have that very large data file in your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=110.66499999999996) [primary filegroup, and then you have to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=113.43166666666666) [come along later and create another](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=115.76499999999996) [filegroup, and create additional data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=117.76499999999993) [files there, and then go through the pain](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=119.60710526315789) [of moving your data from one filegroup to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=122.97552631578945) [another by doing things such rebuilding a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=126.34394736842101) [clustered index and moving it from one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=128.43166666666664) [filegroup to another, and that can be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=130.37611111111104) [pretty painful when you've got really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=132.29131578947369) [large tables, so if you do this from the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=133.87026315789478) [beginning, you'll be much better off going forward.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=6&mode=live&start=136.23868421052643)

[Database File Layout Considerations](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live)

[Database File Layout Considerations. What](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=2) [you need to do as you're planning your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=3.967812499999999) [database file layout and how you're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=7.116312499999998) [to provision your LUNs, is your SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=9.527769230769234) [workload. So, for example, if you've got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=11.989307692307701) [an OLTP workload, it means you're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=13.797) [have lots of writes to your transaction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=15.797) [log file, for example, and you might have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=17.630333333333333) [a decent amount of writes to your data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=20.29699999999999) [files, and so keep that kind of thing in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=22.963666666666647) [mind when you're planning where to layout](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=25.64994117647058) [your files. So if you follow my](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=27.708764705882338) [instructions from the previous slide,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=29.685888888888893) [you're going to have a main filegroup with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=31.074777777777786) [at least two data files, and depending on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=33.297) [your workload you might be able to get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=35.297) [away with having those on the same LUN, or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=37.297) [you might have to have them on separate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=39.79699999999998) [LUNs, assuming that the LUNs actually have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=42.19699999999996) [different disks beneath them. So these are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=44.297) [the kind of things you need to think about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=45.85255555555555) [as you're deciding how to layout things.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=47.85255555555554) [You also need to think about the fact that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=49.87594736842106) [you've got data files, and you've got log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=52.71805263157897) [files, and you also have your SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=55.297000000000004) [backup files and your tempdb data files](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=57.96366666666669) [and log files, and so all of those are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=60.29700000000004) [going to have different I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=63.63033333333331) [characteristics in terms of read/write](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=65.57477777777774) [ratio, and how write intensive they are,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=67.51922222222217) [and whether you need RAID 10 versus RAID](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=69.61278947368417) [5, whether you need flash storage versus](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=71.71805263157886) [magnetic storage, so these are things you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=73.64994117647059) [need to be thinking about, and ideally, if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=76.12052941176475) [you've got an existing database you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=78.9440588235295) [run some queries and look at some PerfMon](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=81.19173684210523) [metrics, and get an idea for what's going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=83.71805263157887) [on with these different files for your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=86.29699999999998) [particular workload. And this is going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=88.63033333333328) [affect things like, again, what RAID level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=91.04699999999997) [you use, how many spindles you set up,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=93.49699999999993) [what level performance you need, and what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=96.297) [kind of storage you're going to choose,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=97.9440588235294) [whether it's magnetic or flash-based storage.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=7&mode=live&start=99.59111764705881)

[Database File Size and Growth Settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live)

[Database File Size and Growth Settings.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=2) [It's really important that you go in and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=3.5214736842105268) [look at this for all of your user](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=5.550105263157896) [databases, and also for tempdb in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=7.717999999999999)[particular. You want to go in there and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=9.518000000000002) [think about what's going on, and you want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=11.918000000000008) [to choose the initial size of your files,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=14.408909090909091) [both for your data files and your log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=16.954363636363635) [file. What you want to do also is manually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=19.499818181818167) [and explicitly manage your file growth. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=23.246571428571418) [whatever file size you start off with, you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=26.151333333333334) [want to make sure you've got enough space](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=28.81799999999999) [to last for a certain amount of time,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=31.484666666666648) [maybe 6-8 weeks, for example, and grow the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=34.46505882352942) [files manually yourself so that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=37.75917647058826) [auto\_growth doesn't actually have to kick](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=39.818) [in except for an emergency. Now you want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=41.9998181818182) [to leave auto-growth enabled and set it to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=44.765368421052635) [a specific amount in megabytes or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=47.291684210526334) [gigabytes rather than a percentage-based](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=49.18642105263161) [growth increment, and that's just in case](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=50.87682352941176) [something happens and you run out of space](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=53.34741176470587) [it can actually grow, and you don't want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=56.068) [to leave it at the default settings, which](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=58.068) [are usually much, much too small. Now the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=60.068) [growth increment amount is really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=63.0055) [important, especially for your transaction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=65.193) [log since every time the transaction log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=67.3805) [grows, whether it's a manual growth or an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=69.81799999999997) [auto growth, it adds a certain number of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=72.4846666666666) [virtual log files, or VLFs, every time](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=75.21799999999998) [that it grows, and if it grows many times](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=77.66799999999994) [in a very small increment, you're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=80.818) [have a very high VLF count, which can case](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=83.7653684210526) [performance problems. What you're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=87.08115789473678) [want to also take a close look at is the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=88.77038095238096) [default growth setting for log files is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=91.15133333333337) [set to 10 percent, and that's a really bad](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=92.818) [idea. You want to go in there and change](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=95.55713043478258) [it to a fixed size in megabytes rather](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=98.29626086956516) [than being 10 percent, because depending](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=100.76536842105261) [on how big it is to start with, 10 percent](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=102.66010526315785) [might be a very small amount, but as the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=105.818) [file gets larger and larger over time a 10](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=108.38942857142862) [percent growth is a larger amount, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=110.96085714285725) [that's going to lead to poor log file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=113.08115789473682) [performance because you're going to have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=115.60747368421046) [higher VLF counts than you otherwise would](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=117.5022105263157) [have had, and your VLFs are going to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=119.4543636363636) [larger as it gets larger over time, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=121.90890909090899) [you don't want that, you want your VLFs to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=124.15133333333333) [have even sizes, so setting log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=127.15133333333328) [auto-growth setting to a fixed size, such](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=129.1513333333333) [as 1000 MB or 2000 MB, is what you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=131.55713043478266) [do, depending on how big your transaction log file is going to be.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=8&mode=live&start=135.3832173913045)

[Demo: Finding Files That Have Percent Growth](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live)

[Okay, right here we have a query that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=2) [going to let us look for files across all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=3.8434285714285714) [our databases on the instance that have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=5.917285714285718) [percent growth enabled, which again, is a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=7.964) [very bad setting in my opinion. So when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=10.589) [you run this query, which looks at sys.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=13.505666666666668) [master files, it's going to show you all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=16.172333333333338) [the databases that have any files that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=18.838999999999995) [have percent\_growth set to 1. So in this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=21.839) [case we've got the master database data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=25.839) [file and the log file, and then the model](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=29.339) [database log file, and then msdb, both the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=32.38445454545454) [data file and the log file have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=34.9299090909091) [percent\_growth enabled. So ideally I would](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=37.260052631578944) [go and change that to a fixed size in MB](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=39.786368421052615) [or GB rather than leaving percent\_growth](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=43.996894736842066) [enabled. So it's a really easy query to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=46.0154705882353) [run, and quite often you're going to find](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=48.36841176470591) [a lot of database files that have this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=52.839) [incorrect setting, so it's very easy to fix.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=9&mode=live&start=60.839)

[Demo: Changing Database Properties with T-SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live)

[Here are a few simple T-SQL commands to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=2) [change some key database properties. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=4.9969230769230775) [they're all basically ALTER DATABASE](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=7.2700000000000005) [statements, so ALTER DATABASE, the name of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=9.270000000000001) [the database, and then you change whatever](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=12.070000000000004) [setting you need to, and then WITH NO\_WAIT](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=14.370000000000003) [is put there by default when you script](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=16.770000000000007) [this out from Management Studio. So we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=19.403333333333336) [just do ALTER DATABASE and SET](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=23.13666666666668) [AUTO\_UPDATE\_STATISTICS\_ASYNC on, that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=26.33666666666669) [the first command, and then we're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=27.458235294117646) [enable DELAYED\_DURABILITY for this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=29.811176470588226) [database with the second command, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=30.987647058823516) [we'll enable CHECKSUMs for the PAGE\_VERIFY](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=33.73666666666667) [option with the third command. And most of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=36.53666666666668) [the database properties that I've](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=39.70333333333333) [discussed in this module can be changed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=41.092222222222226) [with ALTER DATABASE statements like this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=43.036666666666676) [with T-SQL, or you can into the Management](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=44.76999999999999) [Studio GUI and go into the properties for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=47.169999999999966) [the database and change some of these. Of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=49.56999999999994) [course I would think it's a better idea](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=52.20333333333335) [to, if you use the GUI, just use it to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=54.87000000000003) [generate T-SQL rather than writing it out](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=57.82238095238096) [yourself, it saves you some time and it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=59.489047619047646) [a little bit safer than just clicking OK](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=61.39380952380957) [in the dialog box in case you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=63.584285714285706) [double-check what it's going to do before you actually run the command.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=10&mode=live&start=66.15571428571432)

[Module Summary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live)

[So what have we covered in this module?](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=2) [Well, we've talked about some of the key](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=3.9553684210526328) [database property settings that affect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=5.9107368421052655) [performance, scalability, and reliability.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=7.444000000000001) [We also talked about how to layout your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=9.044000000000002) [database filegroups, and then how to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=12.244000000000005) [layout your database files across your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=14.519) [different LUNs thinking about your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=16.769) [workload and what kind of RAID level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=18.644) [you're going to use and what kind of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=20.394) [storage you're going to use. Finally, we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=22.394) [showed you how to actually check and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=25.644) [change some of these database file property settings.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m2&clip=11&mode=live&start=32.644)

[Instance Configuration Settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live)

[This is Glenn Berry with SQL. skills. com.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=0) [I'm recording this course for Pluralsight,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=3.3684210526315788) [and this is module 3, Instance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=5.894736842105262) [Configuration Settings. What are we going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=8.416666666666666) [to cover in this module? We'll be talking](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=10.916666666666663) [about operating system issues that you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=13.882352941176473) [might run into with the SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=15.647058823529418) [instance. We'll talk about operating](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=17.705882352941178) [system configuration settings that are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=19.17647058823529) [related to SQL Server that you need to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=20.647058823529402) [take care of, usually before you install](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=23) [SQL Server, but you can do it afterwards](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=24.842105263157897) [if you miss it. We're also going to talk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=26.947368421052637) [about some instance-level configuration](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=29.66666666666666) [settings that are really important for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=30.99999999999999)[performance and scalability. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=33) [we'll talk about some best practices for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=34.66666666666668) [performance and scalability that are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=37.00000000000003) [related to the operating system and the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=38.625) [instance-level configuration settings that you need to worry about.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=0&mode=live&start=40.8125)

[Operating System Issues](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live)

[Operating system Issues. Not using Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=1.967) [Server 2012 or newer is a really big](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=4.567000000000001) [mistake. If you're still using Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=8.033666666666669) [Server 2008 or Windows Server 2008R2,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=10.0295) [they're actually out of mainstream support](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=11.9045) [if you don't have the service pack on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=13.717) [them, and they just have a lot of issues](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=15.717) [compared to Windows 2012 or newer so you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=17.967) [really don't want to use those for SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=20.46699999999999) [Server. The newer versions of the server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=23.13366666666665) [OS are much better for SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=25.609857142857145) [performance. They've got higher memory](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=28.109857142857148) [limits, they're going to be under](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=29.730157894736834) [Microsoft support for a much longer period](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=31.624894736842087) [of time, they have support for new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=33.83542105263157) [instructions that are supported by the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=36.0295) [latest processors, there's lots of reasons](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=37.9045) [why the latest version of the server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=39.878764705882354) [operating system, which right now is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=42.76111764705884) [Windows Server 2012R2, is the absolute](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=45.23170588235297) [best choice for SQL server. Another thing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=47.256473684210526) [you're going to run into is that you get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=49.09857894736842) [much better clustering support, the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=51.467) [clustering code was completely rewritten](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=53.46699999999999) [in Windows Server 2012, and there's other](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=55.466999999999985) [improvements in 2012R2. The license limits](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=58.217) [in terms of number of cores, and more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=60.467) [importantly the amount of memory is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=63.467) [higher, it's 4 TB instead of 2 TB with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=65.86700000000002)[Windows Server 2012 and newer, and the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=69.46700000000007) [licensing is actually less if you use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=72.217) [Windows Server 2012 Standard Edition or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=74.842) [newer, because they changed that so that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=77.092) [you can use that instead of Enterprise](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=79.58464705882356) [Edition for SQL Server. In the past you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=82.05523529411772) [had to use Enterprise Edition to get above](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=84.80033333333331) [32 GB of RAM, for example, in Standard](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=87.46699999999994) [Edition. It's also real important that you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=90.13366666666657) [have the latest version of the operating](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=91.80033333333337) [system because of the SMB, Server Message](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=93.35588888888897) [Block version that you're going to get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=95.13366666666666) [when you have the latest version of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=97.46699999999996) [OS. Older versions of the OS have an older](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=100.13366666666658) [version of SMB that doesn't work as well](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=102.99331578947364) [for network performance, so you really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=105.51963157894728) [want to have that newer version both for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=107.41436842105261) [the database server and any other servers](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=109.94068421052626) [you might be using to talk to the database server with.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=1&mode=live&start=112.1512105263157)

[Negotiated Versions of SMB](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live)

[Negotiated Versions of Server Message](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=1.729) [Block. This chart shows you what will](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=3.76025) [happen depending on what version of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=6.604) [operating system you have on either side](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=9.152076923076924) [of a connection. So imagine you've got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=11.305923076923083) [Windows Server 2008 on your database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=14.006777777777778) [server and you have Windows Server 2012R2](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=16.673444444444442)[on a file server. If that's the case, it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=19.784555555555542) [going to fall back to the lowest common](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=22.75531578947367) [denominator between those two versions,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=25.28163157894734) [and you'll be running with SMB 2. 0. 2,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=26.956272727272726) [which is not a good thing compared to the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=30.228999999999996) [later versions. So it's really important](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=33.50172727272728) [that you have Windows Server 2012 or newer](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=35.70268421052633) [on both the database server and any file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=38.65005263157899) [servers that you might be talking to and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=41.50677777777778) [any web servers you might talking to, any](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=43.729000000000006) [communication between two different boxes,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=45.951222222222235) [you want to have that latest version of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=47.78455555555554) [Windows Server on both sides so you get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=50.89566666666663) [SMB 3. 0 or newer on both sides of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=53.89566666666667)[conversation. And this is really important](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=57.22900000000003) [both for just regular network](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=59.22900000000004) [communication and things like backups and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=60.979) [restores, and if you're going to use SMB](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=63.229) [file shares for your actual storage which](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=66.229) [is a possible alternative that's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=68.1734444444444) [be more attractive in the future, especially with Windows Server 2016.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=2&mode=live&start=70.1178888888888)

[Lock Pages in Memory (LPIM)](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live)

[Lock Pages in Memory, or LPIM. This is an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=2.05) [operating system right that you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=4.814285714285712) [grant to the SQL Server service so that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=6.964285714285711) [the database engine has this right. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=9.400000000000002) [what this means is it means that when you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=11.500000000000007) [have this in effect the operating system](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=14.200000000000014) [will not be allowed to page out memory](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=16.710526315789473) [when it's under memory pressure. And if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=19.657894736842103) [you do that, which I think is a good idea,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=21.93478260869565) [you want to make sure that you have max](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=24.108695652173893) [server memory set to an appropriate value](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=26.065217391304312) [so that the operating system is not under](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=28.16666666666666) [memory pressure. But at any rate, you go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=30.833333333333318) [into the Local Group Policy Editor and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=33.60000000000001)[navigate your way down through the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=36.05000000000002) [hierarchy until you get to this User](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=38.15000000000003) [Rights Assignment page, and then you find](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=40.29999999999998) [Lock pages in memory, and then you grant](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=42.39999999999996) [this right to the SQL Server service](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=44.81578947368421) [account. And ideally, you're going to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=47.0263157894737) [this before you even install SQL Server,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=49.236842105263186) [once you know what the service account is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=51.07142857142857) [going to be, but if you have to do it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=52.59523809523809) [afterwards you want to make sure and do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=54.5) [it, and then you have to restart the SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=56.78571428571428)[Server service for it to go into effect,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=59.35714285714284) [and there will be a demo of how to do this later on in this course.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=3&mode=live&start=64.5)

[Perform Volume Maintenance Tasks](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live)

[Perform Volume Maintenance Tasks. This is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=2.198) [another operating system right that you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=3.7862352941176467) [want to grant to the SQL Server service](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=5.374470588235294) [account, and again, you get here going the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=7.6979999999999995) [same way through Local Group Policy Editor](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=10.36466666666667) [and navigating your way down to User](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=12.698) [Rights Assignment. And what this right](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=15.276947368421052) [does is it prevents SQL Server from going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=17.487473684210524) [through and zeroing out a data file after](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=20.540105263157898) [it's created or grown, and that's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=23.908526315789487) [default behavior, so whenever you create](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=26.855894736842128) [data file or grow it, it has to allocate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=28.91539130434783) [the space and then go through and zero it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=31.65452173913044) [out. And it does that for security](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=34.393652173913026) [purposes, and it can be quite slow to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=36.698000000000015) [that depending on how fast your I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=39.698000000000036) [subsystem is. And the reason why I think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=41.983714285714285) [this is actually safe to do is that the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=44.26942857142856)[thing that might happen that makes this a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=46.840857142857125) [very, very slight security risk is imagine](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=49.756823529411776) [that somebody put some confidential](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=52.63917647058826) [information in, say, a Microsoft Word](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=54.698) [document out in the same directory where](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=56.81564705882352) [your data files for SQL Server live, which](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=59.28623529411763) [hopefully they wouldn't be allowed to do,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=61.874470588235305) [but imagine they did that right? And then,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=63.93329411764709) [they deleted that file, and then you came](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=66.5161818181818) [along later and grew a data file to go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=69.78890909090906) [over where that Word document used to be.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=73.47072727272722) [So if all that stuff happened,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=76.46270588235296) [theoretically somebody who really knew](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=78.58035294117653) [what they were doing could go in there and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=80.3450588235295) [see that confidential information that had](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=83.80911111111108) [been deleted and then overwritten by your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=86.1424444444444) [SQL Server data file. But I think that's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=88.80326315789472) [pretty remote set of bad practices that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=92.1190526315789) [shouldn't be happening, and if you are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=94.698) [sure that that kind of thing wouldn't be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=96.2535555555556) [happening in your environment, then I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=98.03133333333342) [think it's absolutely safe to do this, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=99.75682352941178) [this can really help performance to eliminate that zeroing out process.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=4&mode=live&start=102.58035294117653)

[Demo: Granting OS Rights to SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live)

[In this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=2) [you how to use Group Policy Editor to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=3.5652000000000017) [grant certain rights in the SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=5.354000000000004) [service account. So what you have to do is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=7.043428571428572) [open up Group Policy Editor, and in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=9.614857142857147) [Windows 7 you just type in gpedit. msc to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=11.614857142857153) [get there, and it would work similar in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=14.926545454545458) [Windows 8 or Windows 10, you just have to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=18.19927272727274) [open up a search screen and find this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=21.84042105263158) [application. And this will open up Local](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=24.78778947368421) [Group Policy Editor, and where you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=27.36673684210526) [go here is Windows Settings and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=30.050947368421046) [Security Settings and then Local Policies,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=32.26147368421051) [and and then User Rights Assignment. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=34.15621052631578) [then once you do all that it's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=36.10836363636364) [open up and show you a list of all the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=38.5629090909091) [different rights that you can grant to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=41.75771428571429) [different users or groups. So we want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=44.75771428571431) [grant two specific rights to the SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=47.472) [Server service account, and the first one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=49.222) [is Lock pages in memory, and these are in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=50.972) [alphabetical order, so if we find Lock](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=53.471999999999994) [pages in memory we can see that nobody has](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=55.47199999999999) [that right, right now. So if we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=58.10836363636364) [double-click on this, then you can click](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=60.33563636363638) [on the Add User or Group and you can type](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=62.56290909090912) [in the account that you want to add this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=66.83563636363637) [to, and it always helps if you can type.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=72.15381818181821) [So once you've got that in there you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=77.472)[hit Check Names and it will go out there](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=79.10836363636368) [and validate that that's a valid account,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=80.74472727272736) [either for your local machine or on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=82.32914285714287) [domain. And once you do that, you click OK](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=84.6148571428572) [and you'll see that it shows up here and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=87.18628571428583) [you have to click Apply and OK, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=90.0174545454545) [it will show up here. And just keep in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=92.88109090909082) [mind that if you do this while the SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=95.56290909090906) [Server service is running, it won't go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=98.01745454545446) [into effect until you restart the SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=99.92654545454532) [Server service, and ideally you want to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=102.22199999999997) [this before you even install SQL Server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=105.02199999999992) [Once you know what the service account is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=107.472) [going to be for the database engine you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=109.29018181818186) [come in here and do this for Lock pages in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=111.10836363636373) [memory and for Perform volume maintenance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=113.722) [tasks like you see down here. Once you've](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=115.597) [done that, you'll be set for these two](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=119.472) [rights and you won't have to worry about it in the future.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=5&mode=live&start=127.472)

[Windows Page File Size](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live)

[Windows Page File Size. If you're using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=2) [SQL Server, you don't really need to worry](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=4.134263157894736) [about the Windows page file that much, in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=6.573421052631581) [my opinion. What you want to do is set it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=9.247545454545454) [to a fixed, relatively small size such as](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=12.883909090909087) [4GB, because there's really no need to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=15.793) [have it be 1. 5 times the OS RAM size,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=18.020272727272715) [which is the default in Windows depending](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=21.20209090909088) [on what version of Windows Server you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=23.338454545454546) [dealing with. Because, really, if the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=25.24754545454546) [database server is actually paging and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=27.204764705882347) [using the page file, that means you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=29.32241176470587) [under very severe external memory](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=31.793) [pressure, and you've got severe problems](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=33.9805) [to worry about, and thinking about, oh,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=36.6055) [the page file should be here or on this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=39.42936363636364) [disk or that disk, and this size or that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=42.29300000000002) [size, is really the least of your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=45.1566363636364) [problems. And Lock pages in memory is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=47.292999999999985) [going to prevent paging of the SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=49.392999999999965) [buffer pool by design, and you should, in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=51.793) [my opinion, have Lock pages in memory and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=54.59300000000001) [set, and enabled, and grant that right to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=57.39300000000002) [the SQL Server service account. So as long](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=59.83647826086956) [as you do that, and as long as you set Max](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=61.92343478260869) [server memory to an appropriate value so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=64.793) [that the operating system is not ever](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=67.5152222222222) [under any memory pressure, you shouldn't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=70.2374444444444) [ever be using the Windows page file, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=72.45966666666666) [just for consistency's sake what I like to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=75.12633333333329) [do is set it to the small fixed size and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=77.79299999999992) [just have it on the C drive and not worry about it too much beyond that.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=6&mode=live&start=85.793)

[Global Trace Flags](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live)

[Global Trace Flags. There's a few really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=2) [key global trace flags that I think should](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=3.849473684210526) [be enabled on pretty much every instance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=5.963157894736842) [of SQL Server. The first one is trace flag](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=8.22) [3226, and what this does is it prevents](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=11.820000000000004) [SQL Server from writing out a message to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=15.02) [your SQL Server error log every single](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=17.420000000000005) [time that you have a successful database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=19.52000000000001) [backup, and this occurs for full backups,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=21.877142857142854) [differential backups, and log backups for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=24.877142857142843) [all of your databases. So all of that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=27.335789473684212) [information goes into your SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=29.86210526315791) [error log by default, and it's really not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=31.756842105263186) [that useful. What's more useful is you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=34.07263157894737) [want to know when you've actually had a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=35.91473684210527) [backup that's failed, and you'll still get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=38.02) [that message if you enable this trace](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=39.8621052631579) [flag, but you won't get all the messages](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=41.7042105263158) [about all of the backups that have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=43.80947368421053) [succeeded. And even if you have this trace](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=45.65157894736843) [flag turned on, you'll still get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=47.75684210526317) [information in MSDB about all your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=49.51999999999999) [backups, so if you want to look at that,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=51.31999999999997) [you can always query MSDB and see that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=54.02) [just like you can without the trace flag](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=57.13111111111109) [being enabled. The next one that I think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=60.242222222222175)[should be enabled for pretty much every](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=63.02000000000002) [single SQL Server instance is trace flag](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=65.35333333333334) [2371, and this has been in the product for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=67.68666666666664) [about six years now. And what it does is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=70.20181818181813) [it lowers the threshold for automatic](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=72.65636363636352) [statistics updates to a much lower value](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=74.46444444444444) [as the table gets larger, because by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=77.57555555555554) [default you don't get an automatic](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=80.68666666666664) [statistics update until 20% of the rows in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=83.06999999999998) [a table have been updated, and on a really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=85.86999999999993) [large table that can be a lot rows, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=89.02)[your automatic statistics updates don't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=91.8325) [happen frequently enough on very large](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=93.395) [tables. And with this in effect, as the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=95.4936842105263) [table gets larger the threshold for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=98.4410526315789) [number of rows that have to be updated](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=101.02) [gets lower and lower, and so I think this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=103.10695652173912) [is a really good idea to have turned on,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=105.45478260869564) [and in fact, Microsoft agrees because](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=108.01999999999998) [they're going to have this enabled by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=110.01999999999995) [default in SQL Server 2016. But if you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=112.35333333333325) [using an older version of SQL Server,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=115.11999999999996)[going back to SQL Server 2008 with a new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=117.56999999999992) [enough build you can turn this on, and I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=120.645) [think it's a good idea. The next one I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=123.4575) [think should be enabled on every single](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=126.0726315789474) [SQL Server instance, really no question](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=127.91473684210534) [about it, is trace flag 1118. What this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=129.49368421052642) [does is it alleviates allocation bit map](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=132.68666666666675) [contention in tempdb when lots of objects](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=135.79777777777795) [are being created and destroyed. So this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=138.79777777777778) [basically makes tempdb work better, and it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=141.51999999999998) [was really important to have this in place](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=144.24222222222218) [for SQL Server 2000, but even for newer](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=147.11999999999998) [versions of SQL Server it's helpful, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=149.91999999999993) [Paul Randall talks about this in a blog](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=152.28315789473686) [post he wrote several years ago, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=154.38842105263166) [there's really absolutely no downside to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=156.2305263157896) [having this trace flag enabled, and in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=158.18666666666667) [fact Microsoft agrees on this because this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=160.90888888888887) [is going to be default behavior for SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=163.63111111111107) [Server 2016 also. But if you have an older](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=166.1200000000001) [version of SQL Server, just enable this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=168.8200000000002) [trace flag. And then the final one that I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=170.87714285714284) [think is a good idea for pretty much every](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=173.44857142857134) [single instance is trace flag 3023, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=176.02) [what this does is it enables default](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=179.33578947368431) [backup CHECKSUMs, and so that means even](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=182.65157894736862) [if you don't use it in your backup command](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=185.56545454545457) [when you run a backup, if you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=188.0200000000001) [CHECKSUM set up for your page verification](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=190.20181818181834) [for the database, then as it's writing out](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=192.57555555555555) [the backup file it checks those CHECKSUMs](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=195.68666666666664) [before it continues with the backup, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=198.3884210526316) [if any of those CHECKSUMs fila it will](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=200.96736842105273) [stop the backup. And it also writes out a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=203.91473684210544) [CHECKSUM for the entire backup, so this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=206.73428571428568) [just gives you a little bit better chance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=208.73428571428562) [of having a good backup and not taking a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=211.02) [database that has problems and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=214.16999999999996) [backing that up, and then when you try to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=216.26999999999992) [restore it later it turns out you've got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=219.02) [problems restoring the backup. Now in SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=221.02) [Server 2014 they added an SP configure](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=223.441052631579) [setting that lets you also do this using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=226.7568421052633) [SPConfigure. So you can do it that way](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=230.54631578947394) [with 2014, but with older versions of SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=232.6866666666667) [Server if you want this behavior you need](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=234.59142857142862) [to use trace flag 3023. Now, again, these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=236.72) [should all be global trace flags, and they](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=239.51999999999995) [should also be added as startup](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=242.3199999999999) [parameters, and so you want to go in there](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=244.42) [to SQL Configuration Manager and add these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=247.56999999999994) [as startup parameters so that way every](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=250.02) [time SQL Server starts these will all go into effect.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=7&mode=live&start=257.02)

[Tempdb Configuration Settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live)

[Tempdb Configuration Settings. It's really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=2) [important that you go in and make some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=3.6281250000000003) [changes over the default configuration](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=6.233124999999998) [setting for tempdb when you install SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=8.01) [Server. So what I typically like to do is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=10.810000000000002) [start off with four to eight tempdb data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=13.296956521739126) [files that are all the same size and they](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=15.383913043478252) [can all be in the same directory and in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=17.78142857142857) [the same LUN, that's not really important](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=20.352857142857133) [for most workloads, but having four to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=22.352857142857125) [eight of them that are all the same size](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=24.54333333333333) [is much, much better than having just one,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=27.54333333333332) [which is the default prior to SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=30.21) [2016. And then you want to make sure that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=32.1147619047619) [they all have their auto-growth set to the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=34.257619047619066) [same size in MB, not to a percentage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=36.765555555555544) [growth, and that the auto-growth increment](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=39.87666666666663) [is the same size for every one of the data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=42.21) [files. And then you want to think about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=44.48272727272727) [where are you going to have your tempdb](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=46.30090909090908) [data files and your log file, although the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=48.321111111111115) [log file is not as important. Typically](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=50.543333333333344) [you want to use a fast, dedicated LUN](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=52.59888888888889) [that's not doing anything besides tempdb,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=55.70999999999997) [and you might want to use flash-based](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=58.04333333333329)[storage if your workload requires it. So,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=60.543333333333344) [for example, if you're going to use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=62.876666666666694) [read\_committed\_snapshot isolation that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=65.21) [puts more of a load on tempdb, so that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=66.26882352941178) [might be a good candidate for using flash](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=69.44529411764712) [storage. And if you just know that you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=71.9994736842105) [going to use tempdb a lot, especially with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=74.10473684210518) [lots of rights, flash storage can be very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=76.21) [helpful in some cases, and it's also](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=78.94684210526312) [important that you use trace flag 1118](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=81.34157894736835) [that we previously talked about to help tempdb perform better.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=8&mode=live&start=85.71)

[Instance-level Configuration Settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live)

[Instance-level Configuration Settings.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=2) [There are certain really important](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=3.5596999999999994) [instance-level configuration settings for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=6.1591999999999985) [SQL Server that I think you need to think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=7.620052631578947) [about and possibly change to get the best](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=9.514789473684214) [performance and scalability, and also to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=11.199) [increase the reliability of your instance.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=13.698999999999996) [One of the first ones that I think is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=16.199) [important is new for SQL Server 2014, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=18.770428571428564) [it's backup checksum default. So if you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=21.05614285714284) [enable this, you're going to get backup](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=23.099000000000004)[checksum by default, whether or not you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=25.19900000000001) [specify it with your backup command. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=27.299000000000014) [like I talked about previously, what this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=29.672684210526317) [does is if you have checksum for your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=32.25163157894737) [page\_verify option for a database, then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=35.199) [when your backup is running you're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=36.86566666666667) [to get the checksums as it's being written](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=38.81011111111112) [to the backup file, checked, and if one of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=41.032333333333334) [those fails the backup will halt. Plus,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=43.53233333333334) [when the entire backup is done it writes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=45.498999999999995) [out another checksum, so the net sum of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=47.89899999999997) [this is that you're more likely to get a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=50.29899999999995) [good backup and not have corruption in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=52.56263636363636) [backup, so it's a good idea to turn this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=54.38081818181817) [on, in my opinion, and this is only](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=56.48471428571428) [available in SQL Server 2014. Now the next](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=58.77042857142856) [one is backup compression default, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=61.081352941176476) [backup compression default has been in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=62.84605882352943) [product since SQL Server 2008, they added](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=64.90488235294121) [it to Standard Edition in 2008R2, and this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=67.09373684210523) [is something I think most people should](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=69.62005263157887) [use. Most people have extra CPU to give,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=72.04110526315789) [and the net gain in reduced I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=75.40952631578945) [utilization and a smaller backup file,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=78.35689473684207) [more than makes up for the increased CPU](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=80.97677777777777)[utilization that backup compression will](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=84.53233333333331) [cause, and so quite often you get a very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=86.75455555555553) [good compression ratio when you use backup](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=89.30426315789468) [compression and your backups run much](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=91.14636842105253) [faster and your restores run faster, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=92.824) [it's a good idea for most people. The next](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=95.0115) [one that I think you need to think about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=97.67519047619048)[and possibly change for a lot of workloads](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=99.81804761904765) [is cost threshold for parallelism, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=101.72280952380957) [what this does is it changes the threshold](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=103.6726842105263) [where a query has to be more expensive](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=106.6200526315789) [than that threshold value to get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=109.54899999999999) [parallelized. And what that can do is if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=111.64899999999996) [you turn this on the default is 5, and if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=114.44899999999991) [you raise it to a higher value it means](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=117.62757142857146) [that queries have to be more expensive](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=120.19900000000008) [before they get parallelized, and with a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=122.199) [lot of workloads it makes sense to raise](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=124.29899999999998) [this to a higher value. And there's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=126.69899999999996) [actually some queries you can run to try](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=128.699) [to figure out the average cost of your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=130.699) [queries to try to decide whether you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=132.699)[should raise this and what value to raise](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=134.86566666666673) [it to. Now the next one that is also](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=137.53233333333347) [pretty important is max degree of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=140.69900000000004) [parallelism. And the default for this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=142.8418571428572) [0, and that means that SQL Server, the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=145.19900000000007) [optimizer can use all of your available](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=147.8656666666668) [processor cores if it wants to, to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=150.199) [parallelize a very expensive query. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=153.1156666666666) [there are some situations where you might](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=155.449) [want to reduce this. One thing that I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=157.199) [often do is with OLTP workloads I'll have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=159.599) [people set this to the number of physical](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=162.39899999999994) [cores in a NUMA node. So if you have an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=165.199) [8-core processor in a 2-socket server, I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=167.92627272727282) [would set it to 8, for example. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=169.83536363636378)[some products like Microsoft SharePoint](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=172.53233333333338) [Server, they want you to set it to 1 even](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=174.1990000000001) [though that's not always the best thing to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=177.46215789473686) [do, so there's some situations where you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=179.56742105263166) [might change this. Now the next one you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=181.4095263157896) [want to think about pretty carefully is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=183.69900000000007) [max server memory, and this controls how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=185.79900000000015)[much memory SQL Server can use for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=187.89900000000023) [buffer pool and a few other uses, and you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=190.02508695652185) [want to set this to a low enough value so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=192.3729130434785) [that the operating system is never under](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=195.19900000000004) [memory pressure, and this is actually even](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=197.53233333333344) [more important if you have lock pages in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=199.86566666666684) [memory enabled like I think you should.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=202.19899999999996)[So, you know, Jonathan Kehayias has some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=204.199) [good blog posts that talk about formulas](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=206.2990000000001) [you can use to figure out what to set this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=208.39900000000017) [to. And then the last one that I think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=211.199) [people should pretty much always enable is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=213.449) [optimize for ad hoc workloads, and they](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=215.199) [added this way back in SQL Server 2008,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=217.40952631578955)[and this just changes so that the first](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=219.9358421052633) [time you have an ad hoc query, only a stub](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=222.41639130434788) [of the query plan goes into the plan cache](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=225.45986956521756) [instead of the entire plan for that query,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=228.199) [and that means it takes up less memory in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=230.48471428571423) [the plan cache and this helps reduce the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=233.05614285714273) [plan cache bloating in that part of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=235.91328571428568) [plan cache. And it's good to have this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=239.341857142857) [turned on, but unfortunately it doesn't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=241.53233333333338) [completely fix the problem because what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=242.86566666666675) [you end up having is lots of stubs that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=244.199) [take up space, rather than fewer complete](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=247.34899999999996) [plans, so there's something else you need](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=249.79899999999992) [to do that I'll talk about later to help completely address this issue.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=9&mode=live&start=254.199)

[Demo: Changing Instance-level Configuration Settings with T-SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live)

[In this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=2) [you how to set some instance-level options](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=3.89370588235294) [to more appropriate values that might be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=5.78741176470588) [necessary depending on your workload and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=7.849) [what's going on with your server. So the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=9.724) [first thing we want to do is query sys.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=12.230578947368421) [configurations and see what your values](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=15.072684210526317) [are currently. So when I run this,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=16.967421052631575) [depending on what version of SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=18.789476190476186) [you are using, you might get anywhere from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=20.456142857142847) [the mid 60's all the way up to 76 rows. On](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=22.360904761904745) [SQL Server 2014 I have 70 rows that come](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=25.64247826086957) [back from this query. So the ones I want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=28.381608695652183) [to focus on are certain ones like backup](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=31.417181818181817)[checksum default, which was new for SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=34.326272727272745) [Server 2014, backup compression default,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=36.87172727272731) [which has been around for quite a while,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=38.388473684210524) [and then I come down here and look at cost](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=40.493736842105264) [threshold for parallelism and see what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=43.19899999999999) [that's set to. The default for that is 5,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=44.998999999999974) [quite often you want to raise that to a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=47.69899999999995)[higher value. The next one I would look at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=49.962636363636356) [in the results is max degree of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=52.008090909090896) [parallelism which is down here, these are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=53.599) [all in alphabetical order by the way, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=55.69899999999998) [that's set to the default value of 0. Then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=58.098999999999954) [I look at max server memory and probably](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=60.599) [want to change that depending on what's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=62.599) [going on with your server. and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=64.349) [finally, optimize for ad hoc workloads,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=66.80952631578945) [right here, and that one I think should](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=69.0200526315789) [always be enabled. And then finally, what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=71.91478947368421)[you might want to set up is the remote](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=74.12531578947365) [admin connections, set that to be enabled.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=76.9674210526315) [So anyways, that's what the current values](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=79.13746153846154) [are. So then what you can do is come in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=81.29130769230768) [here and just use sp\_configure and pass in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=84.33813043478258) [the value of what you want to change, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=86.77291304347821) [then here's the value of what it's going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=89.4171818181818) [to be changed to, so this is the property](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=91.59899999999993) [you want to change and here's what you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=94.05354545454533) [want to change it to. So if you wanted to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=95.68990909090913) [enable this, you need to run both of these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=97.508090909091) [together, the RECONFIGURE WITH OVERRIDE is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=99.5365) [necessary for it to go into effect. So if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=101.4115) [I run that it would actually change it,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=104.199) [and the same way for this, to enable](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=106.59899999999998) [backup compression default. And if I come](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=108.99899999999995) [down here, cost threshold for parallelism,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=111.02757142857146) [if I want to change it to 25, for example,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=112.74185714285721) [you can see it went from 5 to 25. And if I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=115.599) [want to change my max server memory to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=119.59899999999995) [27000 MB, that would change it right](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=122.26566666666658) [there. And then max degree of parallelism](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=124.349) [you set it to whatever value you want to,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=126.099) [so in my case I'll try setting it to 4.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=128.349) [And then optimize for ad hoc workloads,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=132.28081818181815) [enable that, set it to 1. And then remote](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=135.1444545454545) [admin connections, if we want to enable](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=138.3132857142857) [that, so you can use that to get in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=139.9799523809524) [through the DAC we can run this. So there](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=142.12280952380956) [you go, it's as simple as that, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=144.18990909090903) [you can go back and check if you want to,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=146.2353636363635) [and see that all the values were changed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=148.79900000000004) [to what you wanted to change them to. So,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=151.19900000000013) [for example, if we go to cost threshold](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=153.86215789473684) [for parallelism it's right there, it's set](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=155.96742105263164) [to 25 now. And these go into effect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=157.80952631578958) [immediately, they don't require a restart](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=160.3847142857143) [of SQL Server. Changing some of these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=162.52757142857146) [options will flush out the plan cache so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=164.599) [you might be a little careful about that,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=166.599) [but it's usually not a really big deal for most people.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=10&mode=live&start=168.599)

[Best Practices for Performance and Scalability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live)

[So what are some overall best practices](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=2) [for performance and scalability? Well,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=4.949545454545453) [it's really important that you use the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=6.857222222222222) [latest version of Windows Server, make](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=8.412777777777777) [sure it's at least Windows Server 2012 or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=9.746111111111105) [newer. As of when I'm recording this,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=12.412777777777778) [Windows Server 2012R2 is the latest](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=15.52388888888889) [released version of Windows Server, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=18.19055555555555) [it's important that you use that instead](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=19.950789473684214) [of an earlier version if at all possible.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=21.79289473684211) [It's also really important to make sure to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=23.968333333333334)[configure your operating system properly](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=26.63499999999999) [for performance, so things like making](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=28.30166666666665) [sure the page file is set correctly,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=30.301666666666662) [making sure the Windows power plan is set](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=32.63499999999999) [correctly. Operating system level things](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=35.55807692307692) [are important for SQL Server performance.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=37.86576923076922) [The next thing to think about is to make](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=40.635) [sure you grant the appropriate rights to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=42.885) [the SQL Server Service account. So the two](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=44.635) [important ones are lock pages in memory](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=47.28205882352942) [and perform volume maintenance tasks, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=50.1644117647059) [make sure you grant those two rights to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=52.635) [the SQL Server Service account. It's also](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=54.481153846153866) [really important to use the appropriate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=56.635)[global trace flags that affect performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=59.635) [and scalability, so ones like 1118 and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=62.635) [2371, for example, are really important,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=65.77785714285714) [in my opinion. It's also very important to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=68.34928571428573) [make the appropriate instance-level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=72.32730769230767) [configuration changes with sp\_configure so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=74.4811538461538) [that you're getting the best performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=76.9207142857143) [that you can at the instance level. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=78.63500000000005) [then finally, you want to make sure that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=80.95078947368421) [tempdb is configured properly, so again,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=83.47710526315785) [trace flag 1118 is really important,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=85.37184210526308)[making sure you have more than one data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=87.18045454545454) [file and that they're all the same size](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=89.36227272727267) [and set to grow at the same amount, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=91.5440909090908) [that they're on a fast disk depending on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=94.30166666666665) [your workload. So those are the kind of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=96.96833333333328) [things you need to think about at a high](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=99.135) [level when you're thinking about the OS and SQL Server at the instance level.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=11&mode=live&start=101.385)

[Module Summary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live)

[So what have we covered in this module?](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=2) [Well, we've talked about some operating](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=4.046222222222223) [system issues that you need to think about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=5.580888888888888) [for SQL Server. We also talked about some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=7.854) [operating system configuration settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=10.354) [that are related to SQL Server that are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=11.604) [important to get the best performance and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=14.104)[scalability. We also talked about some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=16.2915) [instance-level configuration settings that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=18.389714285714287) [are important for scalability and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=19.818285714285718) [performance. And then finally, we talked](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=21.604) [about just some overall best practices for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=23.854) [the operating system and SQL Server at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=26.479) [instance level. And all these things are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=28.992888888888892) [important, all these little details are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=30.937333333333342) [important to get the best performance and scalability you can for SQL Server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m3&clip=12&mode=live&start=32.604)

[Storage Subsystem Issues](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live)

[Storage Subsystem Issues. In this module](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=0) [we're going to talk about common storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=4.833333333333333) [subsystem issues that you typically run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=6.777777777777777) [into with SQL Server. We're also going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=8.444444444444445) [talk about how you go about designing a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=10.666666666666671) [storage subsystem for different kinds of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=12.8888888888889) [SQL Server workloads. We'll discuss how to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=14.857142857142858)[configure your storage for scalability.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=17.85714285714285) [And then finally, I'll show you a couple](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=20) [of free disk benchmark tools you can use to actually test your storage subsystem.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=0&mode=live&start=22.19999999999999)

[Common Storage Subsystem Issues](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live)

[Common Storage Subsystem Issues. One issue](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=1.957) [you very often run into with SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=3.933470588235295) [instances is just having inadequate random](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=6.5687647058823515) [or sequential I/O performance for your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=9.057) [workload, and this can be manifested in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=12.057) [many different ways. Especially for SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=15.557) [Server, it's really important to have good](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=17.432) [sequential I/O performance for things you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=19.6195) [do on a daily basis such as creating](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=21.792294117647053) [indexes, rebuilding indexes, taking](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=25.086411764705865) [database backups, and things of that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=26.73347058823527) [nature. It's also very common to run into](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=29.112555555555556) [systems that have just an inappropriate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=32.22366666666667) [RAID level for their workload or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=34.557) [availability SLA requirements. So, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=37.890333333333345) [example, if you know you're going to have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=40.001444444444445) [a very write-intensive workload, whether](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=41.77922222222222) [it's for your data files or your log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=42.890333333333324) [files, you probably wouldn't want to have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=45.135947368421064) [RAID 5 or any other parity-based RAID](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=47.34647368421055) [level for the LUNs where that file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=49.557) [actually lives in your file system.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=52.78776923076922)[Another thing you see a lot is just an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=55.557) [improper database file layout. So maybe](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=59.01853846153848) [you've got your data files and your log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=61.157) [files on the same LUN, where you might](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=63.556999999999974) [actually have separate LUNs that you could](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=65.95699999999995) [spread those across and get more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=67.94588888888886) [performance, but it really depends on how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=69.61255555555549) [many drives you have and what kind they](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=71.557) [have, whether that's a good idea or not.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=74.057) [It's also common to see misconfiguration](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=76.557) [of your storage subsystem or any caching](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=79.02758823529409) [that might be involved, whether it's on a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=81.90994117647053) [SAN or RAID controller, and that can have a huge effect on your performance.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=1&mode=live&start=87.557)

[Common SQL Server Workload Types and I/O Access Patterns](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live)

[Common SQL Server Workload Types. There](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=2) [are several different kinds of SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=4.13675) [workloads that you're going to have to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=6.6296250000000025) [deal with and think about when you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=8.874470588235296) [designing and configuring your I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=10.933294117647065) [subsystem. The first one is Online](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=12.403882352941187) [Transaction Processing, or OLTP. This kind](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=14.126571428571433) [of a workload is going to see a lot of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=15.840857142857152) [writes to the log file and to the data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=18.698) [files, and it's going to have a premium on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=21.69799999999999) [random I/O performance. The next common](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=24.69799999999998)[type you're going to see quite often is a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=26.598000000000003) [Relational Data Warehouse, or DW sort of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=29.29800000000001) [workload, and this kind of a workload is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=31.398000000000014) [going to see lots of long sequential reads](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=33.5401052631579) [from the data files, so that's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=35.64536842105264) [put different demands on your I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=38.03133333333334) [subsystem. The next type you'll see fairly](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=40.03133333333336) [often Online Analytical Processing, or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=42.36466666666671) [OLAP, and usually that's characterized by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=44.198) [lots of random reads from your cube files.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=46.448) [Finally, you're not usually going to run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=49.36466666666667) [into just one pure workload type on a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=51.69800000000002) [particular server, you're going to see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=54.36466666666671) [mixed workloads, so it might be some OLTP,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=56.64244444444443) [and some reporting kinds of workloads,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=59.753555555555515) [plus you've got things like high](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=61.983714285714285) [availability and database maintenance that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=63.69799999999999) [affect your I/O workload, so you need to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=65.12657142857144)[really think about all of this and look at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=67.198) [some of the available metrics you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=69.448) [gather to decide how to configure your I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=71.52152941176469) [subsystem for the best performance and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=74.81564705882347) [scalability. Different I/O Access Patterns](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=77.28623529411756) [of SQL Server Workloads. For example, an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=79.34505882352938) [OLTP workload is going to have very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=82.22741176470582)[frequent writes to your data files and to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=85.06642105263157) [your log file. It's also going to have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=88.01378947368417) [frequent, usually random, reads from your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=90.96115789473677) [data files if the entire database doesn't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=93.12657142857144) [fit into memory. So random I/O performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=95.62657142857147) [is going to be really important for an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=98.198) [OLTP sort of workload. Now Data Warehouse](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=101.198)[workload typically has large sequential](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=104.0826153846154) [reads from your data files. So sequential](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=106.39030769230773) [read I/O performance is very important,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=109.28623529411765) [again, if the database is not completely](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=111.0509411764706) [in the SQL Server buffer pool. Then an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=113.10976470588238) [OLAP workload typically has lots of random](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=116.36466666666665) [reads from those cube files, so random](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=119.47577777777775) [read I/O performance is really important.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=122.323) [So, again, looking at your overall](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=124.198) [workload, that's going to have an effect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=126.073) [on what kind of storage you select, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=127.78495652173913) [how you configure it as far as the RAID](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=129.52408695652164) [level, and other things that you need to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=131.48060869565197) [think about when you're designing and configuring your I/O subsystem.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=2&mode=live&start=138.698)

[Demo: I/O Related DMV Queries](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live)

[For this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=2) [you a small set of I/O-related DMV queries](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=3.8903499999999993) [you can use to measure what's going on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=6.050750000000002) [with your storage subsystem and SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=8.151) [Server. So the first thing I want to point](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=9.651) [out here, this is a really useful](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=11.901) [knowledge base article that you might want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=13.591476190476186) [to take a look at that talks about some of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=15.258142857142847) [the updates and configuration options for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=17.71678947368421) [SQL Server 2012 and 2014 that are really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=19.61152631578946) [useful to get the best performance out of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=22.137842105263132) [your instance. Now the first query in this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=24.35338095238095) [set is going to just take a look at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=26.258142857142847) [volume information for all the LUNs on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=28.82205263157895) [your system that have any SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=31.76942105263159) [database files on them. So when I run this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=34.71678947368421) [query it shows me I've got a C Drive, an L](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=37.40100000000002) [Drive, and a T Drive, and what the names](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=39.60100000000005) [of those drives are and how big they are,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=41.401) [and how much space they have available.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=43.651) [And having free space available is really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=45.401)[important, both so you don't run out of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=47.2431052631579) [space, and also for your performance, both](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=49.34836842105264) [with magnetic drives and flash storage.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=52.067666666666675) [Now the next query in this small set is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=55.401) [going to look at the drive level latency](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=57.54385714285717) [information for all of the LUNs that have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=59.4486190476191) [SQL Server database files on them. So when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=61.734333333333346) [I run this query it shows me those three](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=64.40100000000002) [drives, and only my C Drive has a little](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=67.401) [bit of read latency in milliseconds, the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=70.40099999999995) [rest of these are 0, but on a real system](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=72.73433333333325) [you'll probably see higher numbers than](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=75.5914761904762) [this, and it will help you figure out if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=77.02004761904765) [one of your LUNs is seeing is seeing high](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=79.16290476190481) [read latency or high write latency and you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=81.68671428571433) [might want to do some further](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=83.97242857142867) [investigation, and this is at the entire](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=85.801) [drive level. Now the next query in this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=88.60100000000004) [set is going to look at this at the file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=90.65099999999997) [level, so for all of the SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=92.73433333333325) [database files on your instance it will](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=94.401) [show you the average read\_stall in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=97.28335294117643) [milliseconds and the average write\_stall](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=99.75394117647052) [in milliseconds, and then the total, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=101.651) [then it shows you how big the file is, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=103.401) [then it shows you what the file is and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=105.901)[where it's located, and then it gets into](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=108.50099999999998) [some metrics about the number of reads and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=110.90099999999995) [the number of writes. So looking at this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=113.30099999999999) [can help you figure out if individual](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=115.70099999999996) [files are seeing high read latency or high](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=117.80099999999995) [write latency, and you can also get an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=119.82957142857144) [idea of what kind of a workload you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=121.73433333333337) [seeing from an I/O perspective, whether](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=123.75394117647059) [it's very read intensive or very write](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=125.87158823529415) [intensive, for example. Now the next query](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=128.3421764705883) [in this small set is going to look at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=130.73433333333338)[whether you have any 15-second I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=133.73433333333347) [warnings in your SQL Server error log, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=135.73433333333352) [this is really bad if you get any of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=138.276) [those. That means that it took more than](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=141.0885) [15 seconds for an I/O to complete. And if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=143.40099999999995) [you see those, that's a really good reason](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=145.901) [to do more investigation to figure out](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=147.901) [what might be going on there. Now the next](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=149.651) [one is this set is going to be focused on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=152.11528571428568) [one particular database that you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=154.97242857142845) [connected to right now and drill into that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=156.401) [and see what's going on from an I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=158.8010000000001) [perspective for each of the files in that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=161.2010000000002) [database. So for this AdventureWorks](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=163.6641578947369) [database we have one data file and one log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=165.243105263158) [file, and we can come over here and see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=168.08521052631596) [how many reads and how many writes we have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=170.58281818181825) [for the data file, and then we can look at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=173.03736363636378) [the log file and see lots of writes and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=175.71678947368426) [almost no reads from that. And you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=178.0852105263159) [some other metrics here that show you, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=180.0676666666667) [example, how many megabytes you've read](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=181.84544444444452) [and written for each of those files. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=183.1787777777779) [this is really useful to, again,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=185.7343333333334) [characterize your workload from an I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=187.73433333333347)[perspective to try to figure out is it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=189.6867142857143) [more an OLTP workload or more of a reporting workload that has lots of reads.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=3&mode=live&start=191.9724285714285)

[Common DMV I/O Query Result Patterns](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live)

[Common DMV I/O Query Result Patterns. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=2) [what are you going to see after you run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=3.697666666666667) [those queries that we just demonstrated?](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=5.88038095238095) [Well it's really common in real life to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=7.426333333333333) [see high write latency for your tempdb](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=10.093000000000004) [data files. So if you see that, one of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=12.426333333333341) [things I always want to take a look at is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=14.759666666666671) [to make sure you've got multiple tempdb](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=16.843000000000004) [data files, again, start with 4-8, and if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=18.46142105263158) [they're all the same size with the same](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=21.40878947368421) [auto-grow increment. It's also really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=24.35615789473684) [important that you're using trace flag](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=26.198263157894736) [1118, which you won't be required with SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=28.40878947368421) [Server 2016 since that will be included by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=31.35615789473684) [default. You also might want to consider](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=34.210647058823525) [using local flash-based storage for your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=36.681235294117634) [tempdb data files. Now it's also common](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=38.793000000000006) [when you run these queries to see very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=41.243000000000016)[high read latency from your user database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=44.04300000000003) [data files. So if you see that, I always](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=46.56668421052633) [look for signs of memory pressure, and if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=49.882473684210574) [you see any signs of memory pressure,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=52.66442857142857) [adding more RAM to your instance is often](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=54.664428571428566) [a very cheap and effective fix for that.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=56.95014285714284) [It's also important that you go through](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=59.740058823529424) [and do your standard workload and index](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=62.62241176470591) [tuning to try to reduce the memory](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=65.40878947368421) [pressure. So, for example, if you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=67.61931578947365) [missing a key index that's causing SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=69.51405263157888) [Server to have to do a clustered index](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=71.72457894736841) [scan or table scan, adding that index can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=74.25089473684206) [alleviate that and quite often take a huge](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=76.7772105263157) [load off your I/O subsystem from a read](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=79.718) [perspective. You also want to think about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=82.718) [perhaps using SQL Server 2014's new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=85.56358823529409) [feature called buffer pool extensions. If](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=88.03417647058818)[you're using Standard Edition, especially,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=90.4459411764706) [that can sometimes help reduce the amount](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=92.21064705882357) [of reads that are happening on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=94.68123529411773) [storage subsystem so it can be an effective, relatively inexpensive fix.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=4&mode=live&start=99.093)

[Sizing Your Storage Subsystem](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live)

[Sizing Your Storage Subsystem. It's really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=2) [important that you use a RAID calculator](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=3.706470588235293) [to make sure there's more than enough disk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=5.697352941176468) [space for your anticipated needs, because](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=8.585) [both magnetic and flash storage benefit](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=11.21) [from having ample free space. Magnetic](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=13.835) [storage can take advantage of what's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=16.235000000000003)[called short stroking, where you get much](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=18.634999999999994) [better performance when you're only using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=20.946111111111115) [a small portion of your available disk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=22.612777777777787) [space, and flash storage has more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=24.557222222222236) [consistent performance and can do a better](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=26.50166666666666) [job with trim operations when it has lots](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=28.834999999999987) [of free space, so you want to make sure](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=31.335)[you have lots of space, both so you don't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=33.585) [run out of space, and so that you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=35.835) [getting the best performance for each one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=37.69214285714286) [of your LUNs. Now after you have enough](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=39.19214285714287) [space, then you want to concentrate on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=41.223888888888894) [performance and make sure that you've](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=43.168333333333344) [configured things properly and have the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=44.835) [right kind of storage to get the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=46.50166666666667) [performance you need to support your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=48.44611111111112) [workload. So ask for what you need to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=50.2725) [support your workload, don't negotiate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=53.7725)[with yourself. So if you have done the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=55.96) [analysis and you see that you have a very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=58.729736842105275) [write-intensive workload that needs really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=61.57184210526319) [good random I/O performance, then ask for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=63.16833333333334) [flash storage and try to use RAID 10, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=65.50166666666665) [example, don't just negotiate with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=68.50166666666661) [yourself and just say, okay, well I can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=70.23499999999997) [get away with magnetic storage and RAID 5,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=73.03499999999993) [don't do that. And then if you really are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=75.835) [seeing budget limitations where you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=79.6244736842105) [to start cutting things, think about your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=82.15078947368417) [workload as you make compromises to meet](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=84.83499999999998) [that budget. So think about, well, I want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=87.16833333333328) [to get the best performance that I can for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=89.63499999999998)[tempdb because of my workload, and then I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=92.33499999999995) [need really good performance from my log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=94.38045454545455) [files so then maybe I can start to give up](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=95.65318181818186) [for where the data files are a little bit,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=97.47136363636373) [and where the database backup files are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=100.30558823529415) [going, for example. Now another thing I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=102.77617647058831) [always want to think about is having](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=104.88763157894734)[certain metrics that you're aiming for so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=106.72973684210518) [you have at least a certain level of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=108.57184210526303) [performance on each one of your LUNs. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=110.83500000000004) [one thing I want to try to get is at least](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=113.16833333333332) [10, 000-20, 000 8K IOPS on every single](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=116.83499999999994) [LUN, and more is always better if you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=119.50166666666657) [do that from a budget point of view. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=121.98884615384613) [for sequential performance I try to have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=124.25605263157894) [at least 1 GB/sec or more of sequential](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=127.20342105263155) [throughput for every single one of my](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=130.57184210526322) [LUNs, and that's going to give you really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=133.01147058823526) [good performance for common administrative](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=135.36441176470575) [tasks like creating indexes, rebuilding](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=136.835) [indexes, taking backups, doing restores,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=139.335) [all these things you do on a daily basis](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=141.835) [as a DBA, if you have really good](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=144.98500000000004) [sequential performance that's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=147.1850000000001) [make your life easier and make these things go so much more quickly.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=5&mode=live&start=148.56000000000012)

[Choosing Storage Types and Subsystem Design Tips](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live)

[Choosing Storage Types for SQL Server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=2) [Flash storage is great for random I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=4.403857142857143) [performance, it's orders of magnitude](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=7.208357142857146) [better than magnetic storage, and flash](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=9.209000000000001) [storage also has better sequential](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=11.609000000000004) [performance than magnetic storage does.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=13.609) [So, for example, your typical magnetic](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=15.609000000000002) [drive can maybe do 150-200 MB/second,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=18.008999999999993) [where a typical flash drive, if it's SATA](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=20.556368421052632) [3, for example, can do about 3 times that.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=24.345842105263152) [Now magnetic storage has fair sequential](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=28.609)[performance, again, typically 150-200](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=31.37823076923076) [MB/second, but where magnetic storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=33.2243846153846) [really falls down is random I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=35.484) [performance, it's so much lower than flash](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=38.109) [storage. And so one thing that's been done](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=41.1715) [for years is having a large controller](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=43.4511052631579) [cache, whether it's an array controller or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=45.2932105263158) [a SAN controller that can mask that poor](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=47.38677777777777) [random I/O that you get with magnetic](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=50.49788888888886) [storage. And flash storage is really just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=53.22011111111106) [the best choice for performance all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=55.91669230769232) [around, and traditionally it's been quite](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=58.22438461538464) [a bit more expensive than magnetic](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=60.484) [storage, but recently flash storage prices](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=62.734) [have gotten to almost parity with magnetic](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=64.90899999999999) [storage, so if you looked at flash storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=67.00899999999997) [a few years ago and were scared off by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=69.40899999999995) [sticker shock, you might want to take](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=71.92478947368417)[another look because flash storage is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=73.76689473684202) [pretty much in the same ballpark](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=75.34584210526303) [price-wise as 15K magnetic storage is.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=78.7908181818182) [Storage Subsystem Design Tips. You always](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=82.609) [want to prefer flash-based storage when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=84.859) [the best random I/O performance is needed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=87.109) [for your particular workload. Now having](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=89.80900000000001) [multiple databases on the same instance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=92.20900000000005) [tends to create a more random I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=94.609) [workload. So, for example, if you had one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=97.40900000000003) [OLTP database with a single transaction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=100.60900000000008) [log file on its own LUN, you're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=102.94233333333332) [see mostly sequential writes to that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=105.94233333333328) [transaction log file, but if you've got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=107.94233333333325) [more than one database on that instance,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=110.10899999999998) [and you have the transaction log files on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=112.20899999999996) [the same LUN, then that LUN starts to see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=114.609) [more and more of a random I/O workload.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=117.25605882352943) [So, again, having multiple databases on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=119.609) [the same instance, which is very common,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=121.37370588235295) [tends to randomize your I/O workload and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=123.43252941176473) [put more of a priority on having flash](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=125.60899999999998) [storage. Now you also want to prefer RAID](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=128.2756666666666) [10 when you really need the best write](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=130.7090000000001) [performance since it doesn't use parity](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=133.10900000000018) [and doesn't pay that price for doing the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=134.92478947368423) [parity calculation and then writing a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=137.45110526315798) [second time to write the parity](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=139.3458421052633) [information like the parity-based RAID](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=141.2756666666667) [levels do. Now RAID 5, 6, or 50, which are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=142.9423333333334) [parity-based RAID levels, may be perfectly](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=146.27566666666684) [fine for very read-intensive workloads](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=148.55344444444444) [since you don't have to pay that price of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=150.49788888888887) [doing the extra write to write out the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=153.94233333333335) [parity information. So just, again, think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=156.6090000000001) [about your workload and you might be able](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=158.60900000000015) [to get away with a parity-based level if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=160.7994761904762) [it's mainly reads that you're doing from a particular kind of a file.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=6&mode=live&start=162.70423809523814)

[CrystalDiskMark 5.1 and Microsoft DiskSpd](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live)

[CrystalDiskMark 5. 1. This is a free disk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=1.5) [benchmarking utility that's very quick to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=4.4056) [run and very easy to use, it doesn't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=6.5847999999999995) [really require any special expertise, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=9.469882352941177) [it only takes a few minutes to actually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=11.58752941176471) [run. Now it was completely rewritten in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=14.41105882352942) [version 4. 0 to use MicrosoftDiskSpd for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=16.764) [its actual testing, so it's a more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=19.097333333333324) [realistic benchmark than it used to be in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=21.430666666666664) [older versions. It should always be used](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=24.09733333333332) [for your initial storage testing on every](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=26.514000000000006) [one of your LUNs before you even install](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=28.964000000000016) [SQL Server if at all possible. Now it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=31.764) [doesn't work with mount point, so that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=33.44821052631578) [one thing you might run into as an issue](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=34.92189473684209) [with this tool, but other than that it's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=37.12763636363637) [great tool that's very, very easy to use,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=39.58218181818183) [and it's available for download at this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=41.764) [link. Microsoft DiskSpd. This is a free](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=45.264) [disk benchmarking utility from Microsoft](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=48.014) [that's pretty quick to run, and it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=49.889) [relatively easy to use. It's not quite as](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=52.364) [simple as CrystalDiskMark is, but it gives](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=54.763999999999974) [you a lot more flexibility and gives you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=56.863999999999955) [more detailed results than older tools](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=59.68707692307694) [like SQLIO. And actually, Microsoft has](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=61.99476923076926)[deprecated SQLIO, so you really shouldn't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=64.17576470588236) [be using it anymore for your disk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=66.29341176470592) [benchmarking efforts, you should be using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=68.764) [DiskSpd instead, and use it for your more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=70.639) [comprehensive testing efforts after you've](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=73.139) [used CrystalDiskMark for the quick and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=74.99127272727272) [dirty testing. Now this tool is available for download at this link.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=7&mode=live&start=77.44581818181815)

[Demo: CrystalDiskMark 5.1](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live)

[For this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=2) [you how to use CrystalDiskMark 5. 1. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=3.917499999999999) [I've got two copies of CrystalDiskMark](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=6.085) [going here, one over here on the left that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=7.585) [I already ran the test with five test](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=9.835) [runs, which takes several minutes, so we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=12.098157894736843) [can see the results that came out here,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=14.308684210526318) [and then here's one that I've got set up](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=16.835) [to do one test run, which will go a little](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=18.54928571428571) [bit quicker. And notice that you have a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=20.454047619047607) [textbox down here at the bottom, and it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=22.19863636363636) [up to you to type in the relevant](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=24.016818181818174) [information about whichever LUN that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=25.835) [you're testing when you run this test. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=27.50166666666666) [I'm going to test my C Drive here, and you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=30.107727272727274) [click on the All button, and then the test](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=32.83500000000001) [starts running. And the first thing that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=35.28954545454547) [it does is it writes out a test file of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=36.971363636363634) [whatever size that you picked, and I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=39.2440909090909) [picked a 1 GB file here just to make it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=40.835) [run faster, but in real life you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=43.23500000000002) [use a larger file such as 4 GB or even](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=45.39500000000004) [larger. And the idea there is to keep it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=48.03499999999999) [from fitting completely in your controller](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=50.734999999999964) [cache on your RAID controller, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=52.53499999999995) [example, if at all possible. So while this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=54.085)[is running, we can look at the results](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=56.085) [over here on the copy that finished up,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=58.135) [and the top two rows are the most relevant](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=60.534999999999975) [rows for SQL Server. The top row shows you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=63.23499999999995) [the sequential throughput for reads and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=66.63500000000003) [writes with a queue depth of 32 and one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=69.03500000000007) [thread of execution. So you can see about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=72.50166666666665)[556 MB/s for Reads, and a little bit lower](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=75.16833333333328) [for writes for this consumer-grade SSD.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=78.16833333333324) [And then the next row is random I/O with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=80.54928571428572) [4K Reads and writes with a queue depth of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=84.40642857142859) [32 and 1 thread of execution. And this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=88.09586956521738) [the result in MB/s, but if you hover over](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=90.4436956521739) [it you see the result in IOPS, so almost](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=92.79152173913042) [61, 000 IOPS here, and a little bit lower](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=95.89382352941173) [for the writes. And those are the two most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=99.59970588235286) [important rows for SQL Server, this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=102.63499999999998) [closer to a server kind of workload. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=104.73499999999996) [also while you're looking at these results](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=107.035) [you can pull down some of these settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=108.43500000000002) [and see that you can change your test data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=110.03500000000004)[from default data which is random and not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=113.05722222222221) [compressible, to all zeroes, which is more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=116.61277777777775) [compressible. So you might want to test it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=119.25605263157895) [both ways depending on what kind of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=120.94026315789479) [hardware you're dealing because some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=122.41394736842115) [hardware out there will do write](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=123.89382352941178) [compression to get better write](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=126.01147058823534) [performance and to reduce the number of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=127.77617647058831) [writes to the system. You can also change](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=129.835) [the number of queues and threads by going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=131.835) [into here. All that stuff is available](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=133.835) [there. And then finally, what you really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=135.67710526315796) [ought to do when you're done with all this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=137.5192105263159) [testing, you can take a screenshot to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=139.97785714285712) [share the results, but you can also come](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=141.97785714285706) [in here and do File, Copy, and then you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=144.26357142857128) [can Paste it into an email or into a text](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=146.96543478260878) [editor like this and see the complete](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=150.00891304347846) [results with all the IOPS and everything](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=152.12911764705882) [showing, and also all the information](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=154.1879411764705) [about when the test was run and what the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=155.95264705882337) [parameters were, and this is a good way to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=158.50166666666664) [save your results, so I always do that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=161.00166666666658) [when I run these tests. And this test is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=162.9713636363636) [finally finished, and you can see the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=165.01681818181808) [results are pretty similar, you're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=166.60772727272712) [to get slight variation in your test](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=168.15078947368426) [results when you run it from time to time,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=169.9928947368422) [but it should be fairly consistent at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=172.46) [least when you're dealing with non-shared](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=174.6475) [storage. So, again, this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=176.5225) [CrystalDiskMark, and it's really quick and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=177.7823684210526) [easy to use, and you should always use it at least for your initial storage testing.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=8&mode=live&start=179.2034210526315)

[Demo: Microsoft DiskSpd](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live)

[In this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=2) [you how to use Microsoft DiskSpd. This is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=3.850692307692308) [a very useful disk benchmarking utility](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=6.0685789473684215) [you can use to test not only LUNs, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=7.963315789473685) [mount points. It's free from Microsoft. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=10.80542105263158) [you go out and download it from Microsoft,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=12.937000000000003) [and then you need to unzip the file that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=15.337000000000009)[comes there and take the appropriate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=18.142882352941175) [executable for your operating system and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=20.260529411764697) [put it somewhere easy to find. So in my](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=22.37817647058822) [case I've got it in C DiskSpd, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=25.237000000000005) [here's the actual executable name,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=27.937000000000012) [diskspd, and then you have a bunch of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=29.437) [command line switches you have to pass](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=31.3417619047619) [into it to get different types of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=33.008428571428574) [behavior. So in this case we have a block](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=34.800636363636364) [size of 8K, that's what the -b is for, a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=38.073363636363666) [duration of 30 seconds, we have four](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=41.709727272727335) [outstanding I/O's per thread, we have four](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=45.2495) [threads per test file. The h means to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=49.187) [disable software caching, the -r is a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=52.960809523809516) [random flag, so we're going to do random](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=55.62747619047617)[I/O testing on this test run. The W25 is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=58.67509523809521) [the write percentage, so 25 percentage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=62.31935294117648) [writes and 75% reads. The -l means to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=64.7899411764706) [capture latency information, which is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=68.25518181818181) [really important. And then the Z20M is a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=70.52790909090908) [write source buffer file that's used to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=73.83700000000003) [introduce some randomness into the test so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=76.63700000000007) [that it's more realistic, especially for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=79.437) [compressed data. And then the -c20G means](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=82.10366666666665) [create a 20 GB test file, and it's going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=85.21477777777775) [to be located where you say right here, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=88.77033333333331) [in my case on my T drive with this file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=91.77033333333327) [name. And here's a pipe delimiter that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=95.10366666666656) [going to pipe the results into this text](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=97.83700000000003) [file. So when you start this it's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=101.03700000000008) [do a 5 second warmup before it actually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=103.54226315789468) [starts collecting any metrics, and once I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=105.64752631578936) [start it the command line is shown up here](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=107.52790909090906) [at the top and you can see that it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=109.98245454545446) [starting to stress my processor core right](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=112.437) [here by about 50%, these other ones have a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=115.23700000000004) [little bit of activity. So it's gone](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=118.83700000000009)[through its 5 second warmup, and then it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=121.00842857142857) [runs for 30 seconds since we have a 30](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=122.53223809523809) [second test duration. And when it's done,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=124.2465238095238) [it will go to the next line here in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=126.83700000000003) [command prompt window and we'll see the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=130.83700000000007) [results right down here. So once that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=133.03699999999998) [finishes up we'll open that up and just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=134.4369999999999) [take a real brief look at what kind of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=136.0369999999998) [results you get out of this test. But this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=138.43699999999995) [is what CrystalDiskMark uses under the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=141.1036666666667) [covers, but when you use the command line](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=143.10366666666675) [version like this you have a lot more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=145.7703333333335) [flexibility for how you do the testing. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=147.7413478260869) [when you open this up, now we can see that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=149.4804782608694) [it captured the compete command line that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=151.8054210526316) [you used, plus down here it explains what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=154.38436842105273) [these things mean, plus it uses some of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=157.33173684210544) [the default parameters that you don't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=160.18699999999998) [specify in the command line, and then you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=162.28699999999995) [see the result, it was a 30 second test,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=165.0869999999999) [and a thread count of 4, and we've got 8](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=167.61881818181826) [processors in this machine, and it goes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=170.34609090909106) [through and shows you your CPU usage in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=172.25518181818185) [the test, which is very nice to see, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=174.4370000000001) [then all your I/O results here for each](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=176.89154545454562)[thread. And then down here we see the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=179.687) [latency information. So going in and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=182.687) [analyzing this is another subject, but now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=184.53700000000003) [you know how to run it it's really quite](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=186.46200000000007) [simple to do once you understand what the command line switches are used for.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=9&mode=live&start=188.937)

[Module Summary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live)

[So what did we cover in this module? Well,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=2) [we talked about some common storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=4.200999999999999) [subsystem issues that you often encounter](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=5.668333333333331) [with SQL Server, we also talked about how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=7.401999999999999) [you go about designing a storage subsystem](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=10.068666666666669) [for different SQL Server workloads, we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=12.402) [discussed how to configure storage for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=14.4645) [best performance and scalability, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=16.87075) [finally we looked at two free disk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=18.67977777777778) [benchmark tools that you can use to actually test your storage subsystem.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m4&clip=10&mode=live&start=21.402000000000005)

[Hardware Issues](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live)

[Hardware Issues. This module is going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=0) [talk about common hardware issues that you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=5.470588235294117) [often encounter with SQL Server. We'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=7.5294117647058805) [talk about how to properly configure](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=9.357142857142858) [hardware for the best performance and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=11.500000000000004) [scalability, we'll discuss the effect of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=13.64285714285715) [power management on your performance and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=15.388888888888893)[scalability, and then we'll talk a lot](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=17.055555555555564) [about processor selection for SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=19) [because it's really important both for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=21.25) [licensing purposes and for your overall](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=23.5) [performance and scalability that you're going to get out of a particular machine.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=0&mode=live&start=27)

[Common Hardware Issues](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live)

[Common Hardware Issues. Some of the things](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=2.06) [that I often see out in the field are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=3.9021052631578943) [people using older servers with older](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=6.270526315789477) [slower processors that have lower PCIe](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=8.3725) [slot performance, so they're using older](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=10.9975) [versions of PCIe, for example. The other](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=13.6225) [thing I see a lot is using database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=15.860000000000005) [servers where somebody just made a really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=18.26000000000001) [bad processor choice, so they picked a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=20.375789473684208) [processor with a certain core count with a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=22.58631578947367) [much lower clock speed than they could](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=25.11263157894734) [have picked, and so they're still paying](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=27.171111111111113) [the same SQL Server licensing cost and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=29.115555555555563) [they're getting a lot less performance,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=31.06) [that happens a lot unfortunately. The](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=33.24181818181819) [other thing I see a lot is people picking](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=35.31) [a four-socket database server, where they](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=37.56) [could have used a two-socket server and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=39.06)[saved a lot of money and actually gotten](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=41.21384615384616) [better performance. Another thing I see a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=44.29076923076926) [lot is people getting a database server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=46.82470588235294) [without enough RAM on board. Server grade](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=49.295294117647046) [RAM is quite inexpensive, and it just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=51.67111111111112) [doesn't make sense to skimp on that, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=53.81000000000002) [people do it all the time. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=56.254444444444474) [finally, using an inappropriate BIOS](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=59.47666666666665) [setting for your workload, so disabling](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=61.559999999999974) [hyper-threading, disabling turbo boost,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=64.06) [disabling NUMA, all those things can be very bad depending on your workload.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=1&mode=live&start=65.56)

[Key BIOS Settings](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live)

[So what are some key BIOS settings that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=2.057) [are particularly important for SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=4.307) [performance and scalability? Well the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=5.9945) [first one is Intel Turbo Boost or AMD](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=7.79229411764706) [Turbo Core, they're both similar settings,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=11.086411764705886) [and these should always be enabled in my](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=13.557) [opinion. There's really no performance or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=16.557)[longevity downside from enabling this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=18.807) [setting. I've had some server admins turn](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=20.556999999999995) [off Turbo Boost because they thought it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=22.89033333333332) [was going to cause their server to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=25.223666666666645) [overheat, and that's just not the case,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=26.890333333333327) [it's just going to help performance, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=28.445888888888877) [there's built in thermal management](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=30.356999999999996) [throttling mechanisms that's going to keep](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=32.35699999999999) [it from causing any kind of a problem. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=34.756999999999984) [the next one that's somewhat more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=37.7445) [controversial, is Intel hyper-threading,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=39.6195) [and that should be enabled in most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=41.11255555555556) [situations. It's going to give you more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=45.00144444444446) [capacity for OLTP workloads, but it can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=47.89033333333332) [sometimes hurt performance for pure Data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=50.61255555555552) [Warehouse workloads where lots of your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=52.98557142857143) [queries are parallelized across multiple](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=55.557000000000016) [processor cores, so what you really want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=57.69985714285717) [to do is do some testing before you decide](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=59.557000000000016) [to disable it, even with Data Warehouse](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=61.35700000000004) [workloads, but generally speaking](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=62.957) [hyper-threading helps in most situations](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=64.557) [and I like to leave it enabled at least by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=66.55700000000003) [default. And if you're going to be working](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=70.13594736842103) [with virtualization so you have a host](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=72.66226315789467) [that's going to host a lot of VMs that run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=74.87278947368421) [SQL Server, you might want to disable](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=78.03068421052626) [hyper-threading, because if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=80.2412105263157) [hyper-threading is enabled on the host,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=81.157) [then all the virtual CPUs on your VMs are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=82.95699999999998) [going to be using logical cores instead of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=85.65699999999995) [physical cores, and you're paying the same](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=88.32170588235297) [SQL Server licensing cost for each core](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=90.79229411764713) [whether it's a logical core or a physical](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=93.157) [core, and with a logical core you're not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=95.55699999999997) [getting the same level of performance as](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=97.95699999999995) [you are with an actual pure, real physical](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=100.69985714285716) [core. So even though you won't be able to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=104.1284285714286) [host as many VMs, you'll get better](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=106.46176190476193) [performance on your VMs if you disable](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=108.12842857142861)[hyper-threading at the host level, at least for SQL Server usage.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=2&mode=live&start=110.557)

[PCIe Throughput Limits](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live)

[PCIe Slot Throughput Limits. Depending on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=2) [how old your server is, you might have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=4.428736842105264) [PCIe version 1, version 2 or version 3,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=7.667052631578953) [and these different versions of PCIe have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=10.844846153846156) [different throughput limits. So PCIe 1. 0,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=13.537153846153851) [which is going to be on a server that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=15.76792307692308) [maybe 4, 5, 6 years old, if you have an x4](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=18.19100000000001) [slot, and x4 means 4 lanes, well if that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=21.15253846153848) [the case, the entire slot can only do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=24.840999999999994) [about 750MB/sec, so lots of things that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=28.44099999999999) [you might decide to plug into that slot](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=31.217315789473684) [are going to be severely constrained by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=33.32257894736842) [that limit. So, for example, a RAID](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=35.16468421052632) [controller or a PCIe add-in card that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=37.533105263157914) [for flash storage, or even a high-speed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=40.11205263157899) [network interface card that can do 10GB or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=42.691) [40GB/sec is going to be severely limited](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=46.48047368421052) [by that x4 slot. Now slightly better is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=49.79626315789473) [PCIe version 2. 0, which has roughly](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=53.21480952380952) [double the bandwidth for an x4 or an x8](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=55.88147619047618) [slot. But even these, which are going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=59.310047619047594) [be found in lots of servers that are only](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=60.90839130434781)[maybe 2 or 3 years old are going to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=62.47360869565213) [pretty well limited for some of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=64.591) [higher-end things you might want to plug](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=66.69099999999997) [into that slot. And where you want to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=68.79099999999995) [is PCIe 3. 0, and that's going to be only](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=71.97671428571428) [on Intel Xeon E5's and Intel Xeon E7 v2 or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=75.78623809523808) [newer processors, so if you have any of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=79.5091818181818) [those kind of processors you've got PCIe](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=82.41827272727268) [3. 0 and you've got double the bandwidth](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=84.9637272727272) [of 2. 0, and that's really where you want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=87.40528571428575) [to be for the highest end things that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=89.97671428571438) [you're going to plug into those slots such](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=92.35766666666666) [as flash storage cards and 100GB Ethernet](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=95.02433333333329) [cards, things of that nature, so they're not throttled by the slot itself.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=3&mode=live&start=97.35766666666659)

[Power Management](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live)

[Power management can be done at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=2) [hardware level, at the hypervisor level or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=4.198777777777777) [software level in Windows, and all of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=6.397555555555554) [these can have a noticeable negative](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=8.88929411764706) [effect on server performance especially](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=11.35988235294118) [for database servers. Now power management](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=13.418705882352945) [is a good idea for laptops, it makes your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=15.536352941176473) [battery last longer, and it's a good idea](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=18.183411764705877) [for desktops, it reduces your electric](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=20.5915) [bill, but for mission-critical database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=22.4665) [servers, the small amount of power that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=24.029)[you don't use by using power management](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=26.418705882352935) [has a very heavy price. I've seen anywhere](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=28.889294117647044) [from 20-25% difference between having](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=31.9665) [power management enabled and not having it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=34.154) [enabled. And what happens when power](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=37.2165) [management is in effect, it reduces the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=39.41870588235294) [processor clock speed of your processors,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=41.88929411764705) [and also reduces the PCIe slot voltage so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=43.969789473684216) [it has an effect on your storage subsystem](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=46.496105263157915) [in many, many cases. And so the three](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=49.022421052631614) [levels you're going to run into this is at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=51.453999999999986) [the hardware level and your UEFI BIOS.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=54.15399999999996) [You're also going to run into it at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=56.154) [hypervisor level if you're using a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=58.404)[hypervisor such as VMware or HyperV, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=59.904) [then also at the Windows level with the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=62.404) [Windows Server Power Plan. So the latest](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=65.904) [generation processors tend to handle power](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=68.779) [management more effectively so they react](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=71.029) [more quickly when the load changes and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=73.279) [they throttle up a little bit more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=75.79685714285716) [quickly. But even the very latest Haswell](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=78.29685714285719) [processors still have issues with power](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=80.904) [management, so if power management is in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=83.154) [effect you're going to have a performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=85.32066666666668) [hit, and that's something you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=86.87622222222228) [avoid with a mission-critical database server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=4&mode=live&start=88.43177777777788)

[BIOS Power Management and Using CPU-Z](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live)

[BIOS Power Management. BIOS-level power](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=2) [management is going to override what the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=3.619062499999999) [Windows Power Plan is looking for, so if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=5.885749999999998) [you have the Windows Power Plan set to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=8.181) [high performance, but you've got a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=10.181) [different level of power management set at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=11.681) [the BIOS level, the BIOS level is going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=13.681000000000003) [win. So the power management should be set](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=16.381000000000007) [to either OS control in the BIOS or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=18.5231052631579) [completely disabled so that Windows has](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=20.628368421052638) [control over what's going on. The energy](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=22.386882352941175) [savings that you get from using either](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=24.857470588235284) [BIOS-level power management or Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=27.328058823529393) [power management is really pretty](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=29.431)[expensive in terms of what you lose for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=31.6185) [process performance and storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=34.97511764705882) [performance, and the amount of watts that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=36.15158823529413) [you're going to save when the server is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=38.21041176470591) [running when power management is in effect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=40.628368421052635) [is pretty low compared to the overall](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=42.83889473684212) [usage by the entire server. And what you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=45.04942105263161) [really want to do is use CPU-Z to check](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=47.781000000000006) [what speed the processor cores are running](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=50.93100000000002) [at, both when the server is idle and when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=53.25242857142857) [it's under some load, so you can see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=55.82385714285713) [what's really going on between the BIOS](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=58.10957142857141) [and the Windows power management settings,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=60.347666666666676) [and make sure you're not giving up a big](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=62.34766666666669)[chunk of performance just to save a few](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=65.53814285714286) [watts of energy consumption. Using CPU-Z](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=68.9667142857143) [to Check Power Management Settings. CPU-Z](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=71.41784210526315) [is a free tool that you should use to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=73.6283684210526) [check your processor clock speed. You can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=76.94415789473678) [download it at this link. Now you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=79.18099999999998) [use this to check whether any form of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=81.88099999999996)[power management is in effect, whether](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=84.38099999999999) [it's at the Windows Power Plan level or at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=86.48099999999995) [the BIOS level. You can also use it to see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=89.6309999999999) [whether or not Intel Turbo Boost is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=92.431) [enabled, which it should be enabled, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=94.181) [what you need to do is check to see if the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=95.981) [processor core speed periodically runs](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=99.28099999999996) [faster than the base clock speed. If you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=100.78099999999995) [see that while you're watching it in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=103.62544444444443) [CPU-Z, that's confirmation that Turbo](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=106.34766666666663) [Boost is enabled, which is what you want for the best performance.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=5&mode=live&start=108.29211111111105)

[Demo: Using CPU-Z](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live)

[In this demonstration I'm going to s how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=2) [you have to use CPU-Z to see what's going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=3.465142857142858) [on with your processor clock speed. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=5.113428571428574) [I've got version 1. 74 of CPU-Z running](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=7.257764705882353) [right now on the CPU tab. And when you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=11.022470588235295) [look at this it tells you exactly what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=14.596) [processor you are using, the family of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=16.596)[processor, and right here it tells you the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=18.596) [base clock speed of the processor, it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=20.688105263157897) [really important to know that. So then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=22.530210526315795) [when you come down here and look at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=24.346) [core speed, you see it's jumping around](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=26.596) [between about 1. 6GHz and 4. 3GHz, and so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=28.346) [that tells you that it's being throttled](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=32.027818181818176) [back right now by some form of power](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=35.20963636363635) [management, it's running at a multiplier](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=38.846) [of 16. 0, and it can go up to 43, that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=40.84600000000001) [the highest Turbo Boost speed that this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=44.5126666666667) [processor can do. So you can look at all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=46.66418181818182) [this stuff and then you can look at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=49.11872727272728) [Caches tab and see what's going on with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=51.57327272727274) [the Caches on your processor. You can look](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=53.596) [at the Mainboard tab and see the BIOS](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=55.596) [version of your processor and some more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=57.769076923076916) [details about it. You can look at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=59.92292307692306)[memory tab and it will tell you what kind](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=61.646000000000015) [of memory you have and how much of it you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=63.08600000000005) [have, and what channel mode it's using.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=64.68600000000005) [The SPD tab, Serial Presence Detect, in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=67.846) [some cases will tell you what's in each](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=70.471) [slot. Sometimes on servers this will be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=73.471) [blank, but this tells you what kind of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=75.346) [memory and how large it is in each one of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=77.346) [your slots. And then, this is something](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=80.24599999999998) [new that was added to recent versions of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=82.69599999999994) [CPU-Z. This is a little benchmarking](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=85.4959999999999)[utility that you can use right from here,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=87.03647619047621) [and if you click on this and hit the Bench](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=88.94123809523813) [CPU button, it will run a single-threaded](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=91.58284210526315) [processor test for a few seconds and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=94.16178947368418) [it'll switch and do a multi-processor](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=97.10915789473678) [across all of your cores tests for a few](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=99.27457142857145) [seconds. And when it's done, you can pull](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=102.4888571428572) [down this little reference pull-down and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=105.0335) [compare your processor performance to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=106.9085) [other common processors that are in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=108.41742857142859) [tool, so it's kind of nice to be able to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=110.41742857142863) [do that and see how your processor](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=113.27457142857155) [compares to, perhaps, a newer processor.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=116.11872727272727) [So here is a comparison between mine and a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=118.846) [very high end desktop processor that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=121.84599999999996) [available right now. So you can do all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=123.84599999999993) [that, and while this test is running, I'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=126.30433333333336) [kick it off again, you can go back to the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=128.6376666666667) [CPU tab and see now it's running at full](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=131.55433333333326) [speed, actually above the base clock](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=134.79336842105272) [speed, which tells you that Intel Turbo](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=137.00389473684226) [Boost is actually in effect, and that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=139.41742857142856) [what you want to see. I mean ideally you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=141.4174285714285) [want to see it running at full base clock](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=143.93690909090913) [speed even when it's at idle, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=146.39145454545465) [when you put a load on it it goes into](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=148.5732727272729) [Turbo Boost mode at least periodically,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=151.4174285714285) [and that tells you that power management](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=153.13171428571417) [is set correctly and Turbo Boost is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=155.06822222222223) [enabled, and that's what you want for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=156.62377777777783) [very best performance on your database server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=6&mode=live&start=158.40155555555566)

[Demo: Windows Power Plan Setting](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live)

[In this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=2) [you how the power plan works in Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=3.5648499999999994) [and then how that relates to your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=5.353250000000002) [processor clock speed. So what you see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=7.071) [here is the Control Panel, the Power](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=9.171000000000001) [Options, and this is in Windows 7, but it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=11.271000000000006) [looks very similar in Windows server 2008](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=13.971000000000004) [and 2008R2, and even in newer versions of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=16.07100000000001) [Windows Server you're going to get a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=18.471) [similar dialog box here. And by default,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=20.804333333333325) [when you install Windows, it's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=23.13766666666665) [use the balanced power plan in Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=25.221) [like you see right here, and it even says](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=26.971) [recommended by Microsoft. And that's not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=29.221) [really the best setting if you're using it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=31.235705882352935) [for a mission-critical database server,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=34.059235294117634) [and what you'll notice is that when it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=35.78678947368421) [in the balanced power plan your core speed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=38.31310526315791)[on your processor is going to be running](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=40.83942105263161) [at lower than your base clock speed, so in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=43.185285714285705) [my case the base clock speed of this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=45.75671428571427) [processor is 3. 5GHz, and it's running at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=48.35988888888888) [about half speed, slightly less than half](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=51.915444444444425) [actually, so that's what's going on in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=55.026555555555525) [balanced power plan. And what happens is,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=57.57099999999998) [when the processor sees a load it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=59.67099999999996) [throttles up, but there's about a 100](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=61.82394117647058) [millisecond delay depending on the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=64.2945294117647) [generation of the processor before that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=66.05923529411767)[happens, and with lots of short duration](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=68.24877777777778) [OLTP queries the query is done executing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=70.97099999999998) [before the processor has had a chance to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=73.69322222222218) [throttle up, so it hurts your query](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=76.47099999999998) [performance, assuming your storage or your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=78.80433333333328) [memory is not a bottleneck. Another place](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=80.78678947368421) [where it comes into play is it throttles](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=82.99731578947365) [down the voltage to your PCIe expansion](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=85.52363157894729) [slots, so that can affect the performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=87.9446842105263) [of things like host bus adapters and PCIe](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=90.52363157894733) [flash storage cards. So having the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=93.471) [balanced power plan, which is a default,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=95.68152631578945) [in place, is really bad for server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=98.26047368421048) [performance. So what you want to do is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=100.80433333333333) [switch it to high performance, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=103.47099999999996) [depending on what's going on at the BIOS](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=105.47099999999993) [level that will immediately throttle up](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=108.69322222222222) [the processor to closer to full speed. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=111.35988888888888) [on my desktop workstation here that's not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=114.83942105263158) [the case, but that's what would happen on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=117.4183684210526) [most real servers. So it would start](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=120.3657368421052) [running at full speed, and then if you put](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=122.38009090909094) [a load on it would actually go above full](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=124.42554545454554) [speed because of Intel Turbo Boost kicking](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=126.471) [in, so you want to make sure to set it to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=128.47100000000003) [high performance and then come in and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=131.61385714285709) [check it with a CPU-Z tool, and then if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=133.42338095238097) [you're not seeing the results that you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=135.56623809523813) [expect, you might have to go into the BIOS](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=137.23290476190482) [and check the power management because](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=139.5762631578948) [that's going to override what happens with the Windows power plan.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=7&mode=live&start=141.1552105263159)

[Processor Selection for SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live)

[When you're deciding what processor to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=2) [choose for a new SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=4.1240000000000006) [implementation, the little details about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=6.248000000000001) [the processor specifications really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=8.064)[matter, and you really want to consider](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=9.664000000000001) [modern Intel processors, and by modern I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=12.464000000000004) [mean Intel Sandy Bridge or newer, paying](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=14.997333333333335) [very close attention to the detailed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=17.330666666666666) [specifications of the processors, and you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=19.33066666666666) [can get those specifications from the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=21.44971428571429) [Intel ARK database. And what you want to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=23.592571428571436) [do is try to focus on maximizing your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=26.8515) [single-threaded processor performance. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=30.3515) [for a given core count processor there](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=32.014) [might be two or three different skews in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=34.46400000000001) [that product line that have the same core](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=37.264000000000024) [count, but the different skews have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=39.997333333333344) [different base and turbo clock speeds, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=41.99733333333336) [example. And Microsoft doesn't care](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=44.33066666666671) [whether you pick a slow processor or a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=45.92715789473685) [fast processor, they just care about the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=48.45347368421055) [core count when it comes to SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=50.664)[licensing, so you might as well pick a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=52.56876190476193) [fast processor and get the most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=54.473523809523854) [performance you can for each one of your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=55.99733333333334) [SQL Server core licenses that you have to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=58.66400000000002) [purchase. The physical core counts are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=61.33066666666671) [really important because they drive your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=63.428705882352936) [licensing costs, and there's a lot more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=65.5463529411765) [detail that you can read by following this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=67.9797894736842) [link, and this has links to more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=70.50610526315785) [information about how to choose a processor for SQL Server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=8&mode=live&start=72.71663157894729)

[Intel Tick-tock Release Strategy](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live)

[The Intel Tick-Tock Release Strategy. Even](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=2) [though this sort of looks like a marketing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=3.6327499999999997) [document, it's actually very useful for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=5.809749999999999) [SQL Server DBAs and people who are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=7.854) [planning their infrastructure needs,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=10.479) [because this shows you how Intel plans and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=11.979) [releases their new processor families. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=15.854) [what goes on here is every 2 years](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=18.654) [roughly, Intel comes out with a whole new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=21.054000000000006) [microarchitecture with a code name. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=23.45400000000001) [going back on this map you have the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=25.353999999999996) [Nehalem microarchitecture, and then you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=28.020666666666653) [had Sandy Bridge, and then you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=29.687333333333314) [Haswell as the latest architecture that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=31.932947368421043) [out at the moment on the server level. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=33.827684210526314) [every 2 years a whole new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=36.72242105263158) [microarchitecture comes out, and then the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=38.932947368421075) [year after that comes out, the tock, you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=41.14347368421057) [have a tick release, where they take that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=44.104) [same basic microarchitecture and shrink](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=47.104) [the manufacturing process technology from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=48.979) [say 45 nanometers down to 32 nanometers,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=51.104) [and that gives you some small increase in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=54.1665) [performance and reduction on how much](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=57.73861538461538) [power the processor uses. So you can use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=60.50784615384614) [this to sort of plan when you're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=63.30638095238096) [upgrade your database servers and also get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=65.44923809523813) [an idea of how old your current database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=67.11590476190482) [servers might be, and so this gives you a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=69.80399999999996) [good piece of guidance for planning when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=72.95399999999991) [you want to do an upgrade to make sure](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=75.1721818181818) [that the stars align so you have a new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=77.6267272727272) [Intel processor and perhaps a new version](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=80.08127272727259) [of Windows Server, and perhaps a new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=82.24873684210523) [version of SQL Server that are all coming](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=84.45926315789467) [out at roughly the same time, and that's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=86.954) [really good time to push for a complete data platform upgrade.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=9&mode=live&start=89.65399999999997)

[Intel Processor Family Tree](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live)

[The Intel Processor Family Tree. Now this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=2) [chart lays out going all the way back to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=4.3263333333333325) [2006 and out to about 2018, the various](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=7.317333333333335) [generations of Intel server processors.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=10.390764705882352) [And the darker bands in this chart, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=12.743705882352941) [starting at 2006 and going to 2008, those](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=16.50841176470588) [are the tock releases, so a new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=19.86135294117646)[microarchitecture was released. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=22.74370588235292) [the lighter bands are the tick releases](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=24.534555555555556) [where you had a process shrink for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=26.479000000000006) [manufacturing process technology. And this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=28.701222222222235) [column in the middle, the model families,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=30.534555555555556) [are some of the model names for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=33.25677777777777) [families of processors, the code names are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=36.379) [on the far right. So this shows you going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=39.17899999999999) [back into time how things have evolved and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=42.778999999999975) [what's going to happen in the near future](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=45.03163157894736) [as far as what's been released publicly.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=46.71584210526314) [And so you can look at the model number of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=48.278999999999996) [your processor from CPU-Z, or even in Task](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=51.27899999999997) [Manager in Windows Server 2012 or newer,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=53.678999999999945) [and figure out, okay, I've got a Xeon E5](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=56.43354545454544) [2600, and now I know that's a Sandy Bridge](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=60.1153636363636) [and it came out back around 2011, so it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=63.80252941176471) [a few generations old, for example, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=67.50841176470584) [you can see how old it is compared to the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=70.26471428571429) [latest and greatest. And as of when I'm](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=73.12185714285721) [recording this, the latest that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=75.36788888888886)[available on the server side is Haswell-EP](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=76.75677777777771) [and Haswell-EX that came out in 2015. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=78.70122222222211) [what's going to come out relatively soon](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=82.0901111111111) [is Broadwell-EP for the 2-socket servers](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=85.2012222222222) [in early 2016. So, again, this kind of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=87.67899999999999) [thing helps you see where you're at and plan when you want to push for an upgrade.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=10&mode=live&start=90.47899999999994)

[Preferred Haswell-EP and Haswell-EX Processors](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live)

[Now as I mentioned previously, the current](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=2) [latest and greatest 2-socket processor](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=4.616600000000001) [family is called Haswell-EP, and there's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=6.485600000000002) [about 40 different processor models in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=9.51609090909091) [that family. So among all those available](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=13.33427272727273) [processor models that you could possibly](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=16.07758823529412) [pick for a new database server, only the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=17.842294117647054)[ones in this chart are good choices for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=20.152454545454546) [SQL Server, and by good choices I mean](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=22.334272727272733) [these are the ones that are going to get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=24.51609090909092) [the most performance at a given core](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=27.145461538461532) [count. So if you look at this chart, at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=29.29930769230768) [the bottom you have a 4-core processor the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=32.389608695652186) [E5-2637 v3, and that one is going to have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=35.17221739130437) [a relatively high base clock speed and a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=38.33427272727273) [high turbo clock speed, and the price is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=41.24336363636367) [on the far right. So if you think you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=44.1524545454546) [can't run your workload on a 4-core](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=47.18594736842106) [processor, you can jump up to 6-core,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=49.39647368421055) [8-core, 10-core, all the way up to 18](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=51.607) [cores, and at each given core count these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=54.55436842105266) [particular models that I have listed in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=57.501736842105316) [the left-hand column give you the best](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=60.107) [performance at that core count. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=62.732) [really, nobody should talk you into](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=64.99588888888889) [getting a processor that's not on this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=67.3292222222222) [chart for a modern 2-socket server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=70.0514444444444) [There's other models of processors you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=72.31288235294119) [could pick, for example, that might be a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=74.43052941176475) [little bit less expensive for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=77.2540588235295) [processor, but you're still paying the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=79.07758823529413) [same SQL Server licensing cost because the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=80.84229411764709) [core count is the same. So you're giving](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=82.907) [up, in some cases, a huge amount of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=85.30699999999997) [performance to save just a few hundred](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=87.70699999999995) [dollars, and that's just ridiculous when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=89.65963157894734) [you look at how much you're paying for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=91.23857894736835) [entire server and your SQL Server license](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=93.607) [costs to give up say 25 or 30 percent of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=96.40700000000004) [your performance to save $1, 000. 00, that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=100.4070000000001) [just doesn't make sense in most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=103.37170588235297) [situations, at least in my opinion. Moving](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=105.48935294117653) [to 4 and 8-socket servers, the available](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=107.9599411764706) [processors that you want to choose from is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=110.43052941176475)[actually a lot more limited than you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=113.2540588235295) [on the 2-socket side. And these ones that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=115.60700000000004) [are showing up on this chart, these four](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=117.89271428571438) [processor models, are really the best](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=120.53007692307693) [choices for performance and scalability.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=123.29930769230774) [So at the 4-core level you have the 8893](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=125.607) [v3, and then going all the up to 18 cores](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=128.60699999999997) [you have the 8890 v3, and there's a big](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=131.9403333333334) [gap between 4 cores and 10 cores. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=135.24336363636363) [there are processor models that have 6 and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=138.51609090909088) [8 cores between those, but they run at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=141.78881818181813) [really low clock speed so they're really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=144.107) [not a good choice for SQL Server. So in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=145.857) [many cases I think you'd probably be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=148.23857894736844) [better off with a 2-socket server with a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=150.44910526315797) [slightly higher core count rather than to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=152.97542105263173) [pick a 4-socket server that has 6 or 8](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=155.2736666666667) [cores for the processor because of that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=158.2736666666668) [huge clock speed difference. And also](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=160.607) [notice the prices for these processors are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=163.407) [really expensive compared to the E5](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=166.6736666666667) [processors, so in most cases you're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=169.08068421052636) [to be better off with two 2-socket](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=171.65963157894748) [servers, or one 2-socket server with a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=174.2385789473686) [high core count processor instead of one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=176.81752631578954) [of these, in many, many cases. But, again,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=179.39647368421066) [if you're not picking from among these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=182.1333157894737) [four that are on the chart, you're not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=183.97542105263165) [making the best choice for a 4-socket or 8-socket database server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=11&mode=live&start=186.08068421052644)

[Module Summary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live)

[So what did we talk about in this module?](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=2) [Well, I discussed common hardware issues](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=4.6872105263157895) [and how they affect SQL Server performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=6.478684210526316) [and scalability. I also talked about how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=8.731823529411766) [to properly configure your hardware for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=11.202411764705888) [the best performance and scalability,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=13.32005882352942) [especially for SQL Server. I talked about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=14.849470588235297)[some of the effects of power management](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=16.90829411764706) [and how to spot what's going on with your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=19.00633333333333) [power management. And then I talked quite](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=22.00633333333332) [a bit about processor selection for SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=23.98878947368421) [Server so that you get the most](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=25.830894736842108) [performance possible for each one of your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=27.673) [core licenses that you actually have to buy for SQL Server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m5&clip=12&mode=live&start=34.673)

[Scaling up SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live)

[Scaling Up SQL Server. What are we going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=0) [to cover in this module? Well first I'm](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=5.800000000000001) [going to talk about the capacity and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=7.400000000000002) [license limits for SQL Server and for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=8.799999999999999) [Windows Server, and how they're different](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=10.411764705882348) [with different versions of SQL Server and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=11.823529411764696) [Windows Server. Next we'll talk about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=13.875) [planning and implementing a hardware](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=16.5) [migration, and there are several different](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=18.6875) [ways of doing it, and I want to show you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=20.652173913043473) [the best way to do it to avoid having](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=22.826086956521717)[downtime. And then finally, I'm going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=24.782608695652137) [talk about migrating to new hardware with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=26.999999999999993) [minimal downtime, and some of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=29.333333333333318) [different ways that you can do that using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=34) [the technologies that are built into SQL Server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=0&mode=live&start=42)

[Windows Server and SQL Server License Limits](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live)

[Windows Server License Limits. Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=1.789) [Server 2012 and Windows Server 2012R2 are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=4.13275) [limited to 640 logical processors and 4TB](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=7.414) [of RAM. Now a logical processors limit is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=10.55215789473684) [not really an issue for most hardware](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=13.920578947368416) [that's actually available right now in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=16.86794736842105) [Windows space, but I see this being a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=18.789)[possible issue in the next year or two.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=20.789) [The 4TB RAM limit actually is a problem](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=23.34782352941177) [right now because current model 4-socket](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=27.58311764705884) [commodity servers can actually exceed that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=30.759588235294146) [4TB RAM limit, so it's pretty easy to go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=33.03900000000001) [out and buy a server from somebody like](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=36.18900000000002) [Dell and be able to put more memory in it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=38.920578947368426)[than Windows actually supports in Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=42.07847368421055) [Server 2012R2, so that's a problem. So,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=43.973210526315825) [luckily, Windows Server 2016 is going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=46.74354545454544) [allow you to have up to 12TB of RAM in a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=49.607181818181786) [single server, which is a nice increase](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=53.989000000000004) [from what you have in Server 2012R2, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=56.439000000000014) [that's actually going to be pretty](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=59.239000000000026) [important for currently available hardware](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=61.57471428571429) [and what's coming on the horizon. SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=63.717571428571446) [Server License Limits. Not only does](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=66.58311764705883) [Windows Server have license limits, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=68.34782352941178) [SQL Server has license limits per](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=70.11252941176474) [instance. So SQL Server 2012 and 2014](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=72.40011111111112) [Enterprise Edition can use up to 640](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=76.28900000000002) [logical processors and 4TB of RAM, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=80.17788888888892) [their limits match what's in Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=83.95566666666666) [Server 2012 and 2012R2. Now SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=87.15566666666665) [2012 Standard Edition is limited to four](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=90.71005263157895) [sockets or 16 physical cores, whichever](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=94.02584210526315) [one is lower, and also it's limited to 64](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=96.86794736842104) [GB of RAM. And, again, this is for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=100.28899999999997) [database engine, and it's per instance,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=103.28899999999993) [and those are both really low limits with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=105.289) [modern hardware and a lot of people have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=107.39426315789468) [been caught by surprise by this. They go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=109.49952631578937) [out and buy a server that has a lot more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=111.59334782608695) [physical cores than that or a lot more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=114.20204347826086) [memory than that, and they find out that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=116.289) [they can't use very much of what they](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=118.81531578947364) [bought, so that's not a good thing at all.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=121.34163157894729) [Now Microsoft raised this limit a little](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=124.38899999999997) [bit in SQL Server 2014 Standard Edition,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=126.83899999999993) [but you're still limited to four sockets](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=129.289)[or 16 physical cores, whichever is lower,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=131.2334444444444) [but they raised the memory limit to 128 GB](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=133.1778888888888) [of RAM, which is a small improvement, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=136.28900000000002) [it's still ridiculously low in my opinion.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=139.48900000000006) [Now SQL Server 2016 Enterprise Edition is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=142.289) [going to be able to use 12TB of RAM, which](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=145.08900000000003) [will match what Windows Server 2016 can do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=149.08900000000008) [on the memory front. Now SQL Server 2016](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=152.51122222222227) [Standard Edition limits are currently](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=156.06677777777793) [unknown. Microsoft has announced that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=158.289) [they're going to raise the core count and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=160.34782352941173) [memory limits, but they haven't specified](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=163.6419411764705) [what they're going to be raised to. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=165.8772352941176) [ideally those would go away completely,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=168.2301764705881)[but Microsoft apparently feels](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=169.99488235294098) [differently, so just be aware that if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=171.414) [you're using Standard Edition for 2012,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=174.039) [2014 or even 2016, you're going to have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=176.289)[limits on the number of cores and the amount of memory you can use.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=1&mode=live&start=184.289)

[Diminishing Returns of Scaling Up](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live)

[Diminishing Returns of Scaling Up. Scaling](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=2) [up refers to the idea of once you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=4.039999999999999) [loaded up a particular server to its](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=7.099999999999998) [capacity, replacing that server with a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=9.626666666666669) [larger server, so going from, say, a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=11.960000000000004) [2-socket server to a 4-socket server. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=14.68222222222223) [even NUMA hardware does not scale in a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=17.210000000000004) [perfectly linear fashion when you do that.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=20.010000000000016) [So NUMA stands for Non-Uniform Memory](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=22.46) [Access, so if you go from a 2-socket](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=24.986315789473693) [server to a 4-socket server, you might](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=28.354736842105282)[think that you're going to have twice the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=30.881052631578946) [capacity that you did with a 2-socket](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=32.56526315789473) [server, but that's not actually true. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=34.038947368421034) [you get a flattening curve of scalability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=36.459999999999994) [as you go from 2 sockets to 4, to 8, all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=39.259999999999984) [the way to 16 sockets, so that's a problem](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=43.510000000000005) [as you go from one size to another. Your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=46.66000000000002) [performance and scalability doesn't scale](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=49.81294117647059) [in a linear fashion, but your cost](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=51.57764705882352) [actually goes up quicker than if you were](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=54.04823529411763) [just doubling, so you have a problem here](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=56.34888888888889)[as you try to scale up. The other problem](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=58.12666666666666) [you run into is that the higher core count](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=60.62666666666666) [processors from any given Intel processor](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=64.12666666666664) [family typically have much lower base](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=66.46) [clock speeds than you see with the lower](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=68.79333333333331) [core count processors in the same family,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=71.9044444444444) [so putting an 18-core processor in instead](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=74.62666666666665) [of an 8-core processor, those higher](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=77.34888888888885) [number of cores actually run at a much](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=79.68222222222217) [lower clock speed and it has a big effect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=82.67052631578944) [on your single-threaded performance. The](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=85.98631578947362) [other issue is that the larger server, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=87.7757894736842) [going from, say, a 2-socket server to a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=90.30210526315784) [4-socket server is probably not going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=92.82842105263148) [have twice the number of PCIe slots, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=95.05090909090906) [that's going to give you a limit for your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=97.59636363636356) [ultimate amount of I/O you can get in and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=100.46) [out of that box as the number of PCIe](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=102.82842105263151) [slots, and what type they are, and how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=105.19684210526303) [many lanes they have. So you would like it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=107.12666666666668) [if you could double the number of PCIe](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=109.26952380952385) [slots, but that just doesn't happen. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=111.25142857142858) [you have a problem here as you try to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=113.09809523809527) [scale up, even though it's pretty easy to do from an engineering perspective.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=2&mode=live&start=115.47238095238102)

[Planning a Hardware Migration](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live)

[Planning a Hardware Migration. There are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=2) [three distinct phases you want to think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=3.706117647058824) [about as you're going through the exercise](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=5.696588235294117) [of planning and implementing a hardware](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=8.034) [migration. The first one is actually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=10.434000000000003) [upgrading your hardware and storage, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=12.598705882352943) [thinking about what new model server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=14.716352941176476)[you're going to get and how you're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=16.834) [to spec it out, and the same thing for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=18.61177777777777) [storage. The next thing is using the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=20.611777777777764) [latest version of Windows Server, whether](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=23.084) [that's Windows Server 2012R2 right now or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=25.334) [in the near future Windows Server 2016.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=27.623473684210527) [It's important that you think about that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=29.465578947368424) [and make sure you use the latest version](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=31.307684210526322) [on your new hardware. The final part of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=33.934000000000005) [the puzzle is using the latest release](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=36.734000000000016) [version of SQL Server. Right now that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=39.184000000000005) [SQL Server 2014, but in the fairly near](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=41.634000000000015) [future that will be SQL Server 2016. So,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=44.434000000000026) [again, you want to try to plan this out so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=47.167333333333346) [that you've got a new generation of Intel](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=50.5006666666667) [processors on a new model server if at all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=53.149789473684216) [possible, the latest version of Windows](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=55.99189473684213) [Server, and then the latest version of SQL Server all together.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=3&mode=live&start=57.8866315789474)

[Resist Temptation to Upgrade-in-place](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live)

[One thing that I think is really important](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=2) [is to resist the temptation to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=4.496470588235294) [upgrade-in-place when you're upgrading](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=6.368823529411767) [either SQL Server or your operating system](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=7.759545454545454) [or your hardware. Upgrading in place is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=10.941363636363638) [supported, but it's very stressful and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=13.805) [risky even though Microsoft does fully](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=16.055) [support it, and I just think it's a bad](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=18.305) [idea. It's much better to do a complete](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=21.455000000000013) [platform upgrade, and what I mean by that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=24.255000000000024) [is getting new hardware, new storage, a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=27.147105263157894) [fresh copy of the latest operating system,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=29.726052631578945) [and a fresh copy of the latest version of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=32.305) [SQL Server. And what you do is you go out](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=34.92999999999998) [and get at least one new server with its](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=37.84666666666662) [storage, and you install a fresh copy of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=40.50499999999999) [the operating system and get it all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=42.904999999999966) [patched and configured, you install a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=45.004999999999946) [fresh copy of SQL Server and get it all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=46.62078947368421) [patched and configured, and then you start](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=48.989210526315794) [going through and doing all your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=51.105) [application testing. This gives you the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=53.50499999999999)[performance benefits of new hardware and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=55.63833333333334) [the latest operating system, and it lets](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=57.63833333333336) [you do a much better job of testing in a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=59.97166666666671) [more stress-free environment. It lets you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=64.805) [install and patch and configure everything](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=67.25236842105262) [in a stress-free manner, so you can do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=69.14710526315785) [this over a period of days and weeks](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=71.6734210526315)[instead of trying to do an in-place](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=74.40499999999997) [upgrade where you take an outage, say, on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=76.85499999999993) [a Saturday morning and try to frantically](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=79.68) [get everything done and tested over the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=82.305) [weekend. If you have a whole new platform](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=84.93) [that you can set up while your old one is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=87.21409090909087) [still in production, that lets you do a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=89.94136363636353) [much better job with much less stress and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=92.205) [get everything configured and tested](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=94.60499999999998) [before you go live. And, again, you can do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=96.10499999999996) [as much application testing as you need to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=98.88394736842103) [before you do your production migration,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=101.41026315789468) [and this is a much, much better way to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=103.305) [it rather than letting somebody pressure](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=106.16214285714292) [you into upgrading in place on your old](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=107.87642857142868) [hardware. That's just fraught with risk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=112.305) [and stress, and you really want to try to avoid it.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=4&mode=live&start=118.305)

[Smoothly Migrating to New Hardware](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live)

[Smoothly Migrating to New Hardware. Let's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=2) [assume that you've decided to do a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=4.000625) [complete data platform upgrade rather than](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=6.334687499999998) [trying to upgrade in place. Well how do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=8.120714285714286) [you go about doing this in such a manner](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=10.215952380952388) [to minimize your downtime? Well the best](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=12.573095238095252) [two methods in my experience are using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=15.30558823529412)[database mirroring or log shipping to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=18.187941176470584) [your production migration. And, again,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=20.668333333333337) [this is after you've gone through and set](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=22.05722222222223) [up your new environment and done all sorts](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=24.279444444444458) [of testing and you're completely confident](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=26.71) [that everything is going to work on the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=28.585) [new version of everything. So after you've](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=30.97785714285714) [done all that you can go and ahead of time](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=32.97785714285713) [set up database mirroring or log shipping](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=35.835) [so that you can do a fairly short failover](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=38.41394736842108)[sequence and come up on the new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=41.72973684210532) [environment without a long outage. So this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=43.97785714285714) [gives you a much easier way to do the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=45.97785714285713) [migration with no data loss and a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=48.549285714285695) [relatively short outage, it can just be a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=50.93500000000001) [few seconds in a best-case scenario. This](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=53.73500000000002) [lets you migrate from an older version of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=56.085) [SQL Server on the old environment to a new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=58.085) [version of SQL Server, and if you do this,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=60.335) [it's a one-way, one-time upgrade. So once](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=64.335) [you failover that one time from the old](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=67.335) [version to the new version, there's no](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=69.335) [going back unless you want to go back to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=71.085) [the old environment as it was before you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=73.71) [failed over. And both of these methods](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=76.21) [require a little bit of preparation work](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=78.085) [in advance, but you can do this while](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=79.835) [you're running on the old system, so you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=81.835) [basically have to go through a full backup](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=84.36131578947364) [and restore sequence, but in the meantime](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=86.88763157894728) [you're still running on the old system and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=88.72388888888891) [you're not down while that's happening. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=90.50166666666674) [this is a good way, that I've used many,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=92.1531818181818) [many times with a lot of success, to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=95.01681818181812) [migrate from an old environment to a new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=97.56227272727263) [environment, whether it's just new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=99.94611111111108) [hardware or it's new hardware and a new version of SQL Server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=5&mode=live&start=101.33499999999994)

[Database Mirroring vs. Log Shipping](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live)

[Database mirroring vs. log shipping when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=1.5) [it comes to production migration. Let's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=3.5678181818181818) [compare the two methods, database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=5.691000000000001) [mirroring vs log shipping. Now database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=7.6910000000000025) [mirroring requires a little bit more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=9.957666666666668) [preparation. You've got to go through and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=11.957666666666672) [prepare the mirror, and it's a little bit](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=13.869947368421055) [more complicated than it is with log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=15.975210526315795) [shipping, so log shipping wins there, it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=17.906384615384614) [easier to set up. It's also possible to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=20.06023076923076) [use log shipping if you're using always on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=22.46747058823529) [availability groups on your old](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=24.82041176470587) [environment where if that's the case you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=26.291) [won't be able to do database mirroring for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=28.349823529411758) [your migration if you have that in place](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=30.702764705882338) [on your old environment. Now database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=33.291000000000004) [mirroring has a few more restrictions. You](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=35.29100000000002) [can only mirror to one location, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=37.55415789473684) [example, compared to log shipping where](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=39.39626315789474) [you could go to multiple locations if you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=40.97521052631579) [wanted to. It's also easier to set up log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=43.341) [shipping if you're going to a different](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=46.491000000000014) [domain. You can do it with database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=48.941000000000024) [mirroring, but then you've got to mess](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=50.86994736842105) [around with certificates, and that's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=52.71205263157895) [little bit harder to set up, so log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=54.291) [shipping can be easier to set up when you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=56.10918181818181) [have certain things in place such as](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=58.15463636363635) [domains that are different between the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=60.041) [environments. Also, database mirroring](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=62.291) [puts a little bit more stress on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=63.791) [infrastructure while it's running because](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=66.541) [it's looking at all the transactions that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=68.1035) [are happening and sending them over to the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=70.291) [mirror and replaying them in real time,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=73.40211111111108) [whereas log shipping is just taking your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=76.12433333333328) [transaction log backups and restoring them](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=78.93805882352939) [every so many number of minutes, whatever](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=81.40864705882348) [you've set your schedule up to be, so the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=84.291) [infrastructure is having to work a little](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=86.18573684210531)[harder with database mirroring compared to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=87.65942105263167) [log shipping. Now database mirroring, if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=89.17335294117647) [you do it correctly, you're not going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=90.93805882352943) [have any data loss, and by correctly I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=93.291) [mean you're using synchronous mirroring](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=95.791) [when you failover. Now log shipping, if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=97.3535) [you don't do it correctly you might lose a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=99.20009090909093) [little bit of data, but if you do it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=101.24554545454554) [correctly you should be able to go and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=103.291) [backup the \_\_\_\_\_ tail of the log on the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=105.47281818181813) [old system and make sure to restore that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=107.92736363636352)[on the new system before you come up, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=110.00528571428572) [if you do that correctly you won't have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=112.14814285714289) [any data loss, but it's a little bit](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=114.05290476190481) [trickier to orchestrate all of that. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=116.44484615384614) [that's some of the pros and cons of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=118.566) [two methods for production migrations, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=121.04100000000005) [both of these can be done with a very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=122.69100000000009) [short outage and little to no data loss,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=128.791) [so those are both good methods for migration.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=6&mode=live&start=136.791)

[Module Summary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live)

[So what did this module cover? We talked](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live&start=2) [about the capacity and license limits for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live&start=4.029894736842106) [both SQL Server and Windows Server, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live&start=5.806052631578946) [how those have changed as the newer](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live&start=7.6781428571428565) [versions have come out. We also talked](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live&start=9.678142857142861) [about how to plan and implement a hardware](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live&start=11.646) [migration, and we talked about some good](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live&start=13.846000000000004) [ways to migrate to new hardware with minimal downtime.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m6&clip=7&mode=live&start=15.771000000000006)

[Scaling Out SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live)

[Scaling Out SQL Server. So what are we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=0) [going to cover in this module? Well, we'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=5.761904761904763) [talk about some of the things that are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=7.285714285714288) [built into SQL Server, some of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=8.80952380952381) [features that help you scale out SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=10.578947368421055) [Server using the features that are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=12.421052631578952) [available right in the product itself. The](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=14) [first one is AlwaysOn availability group](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=16.500000000000004) [replicas. Then we'll talk about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=18.64285714285715) [transactional replication and we'll talk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=21.33333333333333) [about peer-to-peer replication. Next we'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=24.24999999999999) [talk about distributed partition views,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=26.705882352941174) [and then we'll talk about a concept that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=28.47058823529411) [not actually a product feature called](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=31.294117647058805) [service-oriented database architecture, or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=34.22222222222223) [SODA. And then finally we'll talk about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=36.44444444444446) [data-dependent routing, or DDR. And these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=39.39999999999999) [are all different ways that you can scale out SQL Server.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=0&mode=live&start=43)

[SQL Server 2014 Availability Groups](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live)

[AlwaysOn Availability Group Replicas. This](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=2) [is a new feature that was added back in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=3.5555555555555545) [SQL Server 2012 and enhanced in SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=6.3555555555555525) [2014, and it's basically a hybrid between](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=9.466666666666667) [traditional failover clustering and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=12.733333333333334) [database mirroring, it has some of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=14.6) [features of both of those old features.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=17.1) [And what it lets you do from a scale-out](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=19.6) [perspective is you can have up to eight](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=22.44210526315788) [read-only secondary replicas in SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=24.96842105263155) [2014, and so this lets you segregate your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=27.482352941176465) [read-only workload to different database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=31.247058823529393) [instances on different servers, and that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=33.6) [how you can get some scale-out effect. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=35.90769230769232) [in order to take advantage of this you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=38.85) [going to have to make some application](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=40.85) [changes so that you can actually point the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=42.6) [read-only portion of your workload at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=45.13846153846155) [these readable secondaries, and you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=47.44615384615387) [also going to have to spend more money on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=49.15555555555556) [SQL Server licenses because those readable](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=51.655555555555566)[secondaries have to be licensed in order](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=53.32222222222224) [to do this, and so it's not quite as easy](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=55.399999999999984) [as you might thing. And one problem with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=58.399999999999956) [this is that you're not allowed to make](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=60.79999999999999) [any schema changes at all on the secondary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=63.19999999999997) [replicas, so you can't go in and do things](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=65.6) [like add additional indexes to make report](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=68.59999999999995)[inquiries run faster on the secondary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=70.93333333333325) [replicas. The only thing you get that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=72.65263157894734) [helps a little bit with that is that SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=74.49473684210518) [Server will create some temporary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=77.1)[statistics in tempdb on those readable](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=79.6) [secondary instances, so you get a little](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=82.6) [bit of benefit, but it's not as good, by](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=85.35) [any means, as having additional indexes in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=87.6) [place like you might get with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=89.35) [transactional replication on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=91.60000000000002) [subscribers. And so because of this, if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=93.20000000000005) [you've been using transactional](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=95.36470588235295) [replication for reporting, which is a very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=96.54117647058825) [common usage, you're not probably going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=98.6) [be able to replace that with readable](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=100.7875)[secondaries with AlwaysOn availability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=102.975) [groups unfortunately, because again, you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=104.45714285714286) [can't make those schema changes, which are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=106.60000000000001) [usually indexes on your secondary replicas](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=109.6) [like you can on your transactional](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=112.17142857142858) [replication subscribers. And having](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=114.74285714285716) [AlwaysOn availability groups in place puts](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=116.35) [some additional stress on your network and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=118.6) [your storage infrastructure to keep those](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=121.225) [replicas synchronized, and so you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=123.26666666666664) [paying a performance price to have this in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=124.93333333333328) [place, and that is something you need to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=127.43333333333331) [think about if you're having scalability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=129.65555555555548) [problems in the first place. And so if you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=131.3222222222221) [want to read more about this, you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=133.50476190476192) [follow this link and there's a lot more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=135.40952380952385) [detail about this feature and how it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=137.69090909090912) [works. And then this is a diagram that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=140.23636363636373)[shows you one way that you can architect](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=143.17894736842112) [an AlwaysOn availability group. So you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=146.12631578947384) [have to have, all your nodes have to be in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=148.17142857142855) [a Windows Server failover cluster, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=151.02857142857133) [they don't have to have shared storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=152.742857142857) [like traditional failover clusters do, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=155.0117647058823) [they have to have the failover cluster](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=157.1294117647058) [feature installed on each node. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=159.6) [you install SQL Server normally as a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=162.07058823529405) [standalone instance on each one of these](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=164.5411764705881) [nodes, and then you have to enable the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=166.71111111111108) [AlwaysOn availability group feature on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=168.93333333333325) [each instance, and then you can create an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=170.3222222222221) [availability group that has multiple](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=174.1) [databases on your primary replica, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=176.6) [that's how you sort of have to do this.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=179.02857142857144) [And the nice thing about this is it doesn't require shared storage.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=1&mode=live&start=180.95714285714294)

[Transactional Replication](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live)

[Another built-in feature you can use for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=2) [scale-out purposes is transactional](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=4.717499999999999) [replication, and transactional replication](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=6.270357142857142) [has been around for a long time now, and a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=7.645526315789473) [lot of people have some experience with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=9.750789473684215) [it. But basically data is copied between](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=11.224473684210535) [multiple servers and synchronized, so you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=14.06) [have a source database which is called the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=16.685) [publisher, and then you can have as many](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=19.685) [subscribers as you want that are read-only](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=22.185) [copies of what gets pushed out from that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=24.434999999999995) [publisher. And there's different ways of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=27.101666666666652) [doing transactional replication, you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=29.10166666666666) [do push subscriptions or pull](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=30.76833333333332) [subscriptions, and you're going to have a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=32.435) [distribution database in the middle, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=34.76833333333335) [if you set this up correctly you can get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=36.76833333333334) [good scalability with this method. Now the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=39.76833333333336) [publisher database is the only one that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=41.879444444444445) [writeable, and then you can have as many](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=43.434999999999995) [subscriber databases on different servers](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=45.21277777777777) [as you need to, and of course each one of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=46.63499999999999) [those has to be licensed, but doing that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=49.63499999999996) [lets you spread your workload out among](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=52.212777777777774) [multiple servers, at least the read-only](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=54.934999999999974) [portion of it, and that gives you some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=57.26833333333329) [scale-out capability built into the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=60.25318181818184) [product. And one nice thing about this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=62.07136363636367) [you can make schema changes on the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=64.64552631578947) [subscribers, and by schema changes you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=66.8560526315789) [add additional tables if you really want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=68.935) [to, but the most common thing is you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=70.685)[going to add additional indexes to the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=72.685) [tables that you decide to replicate from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=74.935) [the publisher to the subscribers, and that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=77.56) [way your read-only workloads can run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=80.185) [against a subscriber, either just for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=82.435) [reporting purposes, which is a really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=84.685) [common scenario, or for scale-out purposes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=86.50166666666667) [like we're talking about here. And doing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=88.10166666666666) [this is going to put some additional](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=90.185) [workload on your network and storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=92.81) [infrastructure because you've got a log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=95.06)[reader agent that's picking up all the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=97.01394736842103) [writes that happen to the transaction log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=99.22447368421047) [and moving them to the distribution](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=101.435) [database, and then the data that's in the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=103.19970588235296) [distribution database has to be pushed out](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=105.55264705882357) [or pulled to the subscribers, so doing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=107.9086842105263) [that puts some more stress on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=110.48763157894733) [infrastructure so you need to be aware of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=113.06657894736836) [that. And you can get more details about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=115.10166666666669) [this by following this link and reading](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=117.00642857142861) [what they have to say there. This is a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=118.86357142857143) [little diagram of how transactional](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=122.35807692307692) [replication is typically set up. So you've](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=123.89653846153846) [got an application talking to your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=126.02323529411765) [publisher database, and your publisher](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=127.78794117647061)[database is read and write, and you can go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=129.25852941176467) [in and replicate the entire database or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=132.43500000000003) [you can pick and choose what tables and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=135.23500000000007) [what columns, and even what rows you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=138.435) [decide to replicate to your subscribers.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=141.1273076923077) [And then you have a distribution database,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=143.435) [which might be on the same instance, or in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=145.90558823529406)[high-volume, high-performance type](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=149.08205882352928) [scenarios you have it on its own dedicated](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=150.16227272727275) [instance. And all the replicated data gets](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=153.07136363636374) [moved there temporarily by the log reader](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=155.0139473684211) [agent, and then you have a distribution](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=156.85605263157905) [agent that picks up the changes from that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=158.76833333333335) [and pushes them out to the subscribers, or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=161.4350000000001)[the subscribers can pull it themselves](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=164.10166666666683) [from the distribution database. So that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=166.6572222222223) [sort of the topography of a transactional replication setup.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=2&mode=live&start=170.435)

[Peer-to-peer Replication](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live)

[Peer-to-peer replication is another](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=2) [feature that's built into SQL Server that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=3.4437499999999996) [gives you some scale-out capability.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=5.970312500000001) [Peer-to-peer replication gives you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=7.775)[read/write capability on each node, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=9.108333333333336) [it's the only feature that really lets you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=11.10833333333334) [do that that's part of SQL Server. It's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=13.833823529411767) [based on transactional replication, but it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=16.657352941176473) [requires Enterprise Edition, which is not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=18.775) [actually required for regular](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=21.775) [transactional replication. And it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=23.775) [considerably more difficult to set up and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=25.632142857142853) [maintain than basic transactional](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=28.632142857142842) [replication, but if you're willing to go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=30.34642857142855) [through the pain of getting it set up and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=31.917857142857137) [learn how to keep it running, then it does](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=33.632142857142846) [give you the capability to have multiple](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=35.974999999999994) [writable copies of your database. It](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=38.774999999999984) [really just gives you some scale-out for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=41.108333333333334) [read operations, but not so much for write](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=43.441666666666684) [operations, because if you're doing lots](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=46.10833333333337) [and lots of writes on all the nodes then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=47.81847826086956) [the cost of trying to get all the nodes in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=50.16630434782608) [sync outweighs the scalability gains, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=52.775) [if it's mostly reads on your other nodes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=54.98552631578949) [and most of the writes are happening on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=57.93289473684215) [one node, then you can get a decent amount](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=60.880263157894746) [of read-only scalability from this, with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=64.19605263157898) [the option to do a little bit of writing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=66.40657894736843) [on the other nodes. And, again, you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=68.2295454545455) [read more about it at this link. Now going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=69.684090909091) [on, this is what it looks like in a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=72.17500000000001) [peer-to-peer replication topology. So you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=76.37500000000003) [might have three different offices spread](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=78.4808823529412) [around the world here, and they've all got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=80.59852941176476) [read/write copies of a database, and they](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=83.42205882352951) [all are using replication to gradually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=86.2455882352941)[synchronize those, and by gradually we're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=88.71617647058818) [talking probably a few seconds lag](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=91.14342105263158) [depending on how far away you are and how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=93.35394736842103) [quick your network infrastructure and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=96.66973684210521) [storage infrastructure is, and so all of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=98.36323529411766) [these copies of the database will](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=100.42205882352944) [gradually be in sync with each other within a few seconds in most cases.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=3&mode=live&start=102.1867647058824)

[Distributed Partitioned Views](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live)

[Another product feature that helps with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=2) [scale-out capability is called Distributed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=4.431384615384616) [Partition Views. This feature was](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=6.457538461538462) [introduced back in SQL Server 2000, and it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=8.057473684210526) [lets you take large tables and split them](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=10.162736842105266) [by ranges, and then put the portion of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=12.268) [that table that you want to in a separate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=14.553714285714292) [database on a separate server, so that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=17.125142857142865) [gives you some scale-out capability. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=19.168000000000003) [what you would do is you would have a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=20.968000000000007) [UNION ALL view on one of your servers that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=23.668000000000013) [ties all these other servers and databases](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=26.478526315789463) [together that you can query against that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=28.689052631578924) [view. You have a distributed query feature](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=30.856235294117646) [that tries to do some query optimizations](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=32.915058823529414) [to make this work well, but unfortunately](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=34.973882352941196) [in real life this does not usually work](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=37.162736842105275) [very well, but this feature did influence](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=39.689052631578974)[the later partitioned table feature, and you can read more about it at this link.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=4&mode=live&start=43.268)

[Service-oriented Database Architecture (SODA)](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live)

[Service-oriented Database Architecture, or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=2) [SODA. This is an engineering technique](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=3.4226666666666663) [that you can use to partition a database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=5.5566666666666675) [or application by separate business](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=9.001666666666667) [functions. So you can take a monolithic](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=11.779444444444444) [database and split it into multiple](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=14.229736842105265) [databases, but usually you can't do more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=16.12447368421053) [than maybe 4 or 5, because it's just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=18.335) [harder to split a large database into a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=21.135000000000012) [larger number of smaller databases. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=23.935000000000024) [once you do this, each business function](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=26.11277777777778)[lives in a separate database, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=28.835000000000004) [initially this is usually on the same](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=31.16833333333334) [instance on the same machine. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=33.73500000000001) [what you do is you move those separate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=36.18500000000002) [databases to separate database servers,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=38.98500000000003) [and that lets you spread your load across](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=40.890555555555544) [multiple machines and gives you a little](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=44.00166666666663) [bit of scale-out capability, and this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=46.565769230769234) [relatively easy to do compared to some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=48.18115384615387) [things we'll talk about later, but quite](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=49.96) [often this is fairly simple to do. You'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=52.1475) [have to do some application changes to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=54.57309523809524) [make it work, and sometimes you get lucky](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=56.23976190476193) [and you can do it with just different](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=58.144523809523854) [connection strings, so certain functions](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=60.33500000000001) [are using one connection string so they](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=62.00166666666669) [know they have to go to one server, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=64.335) [example. SODA Implementation Details. Some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=67.93500000000004) [things you can do to try to make SODA](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=69.73499999999997) [easier to do is try to separate your data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=72.88499999999992) [in your database and your objects in your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=76.00166666666665) [middle tier by business function as you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=78.66833333333328) [designing them from the beginning. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=81.00166666666658) [using a database schema, besides the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=83.55722222222221) [default dbo schema can help do this, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=86.22388888888887) [you have things in separate schemas in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=89.54552631578947) [your database, that makes it easier to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=91.01921052631583) [split them out later into separate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=92.49289473684219) [databases. The other thing you want to try](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=94.03499999999998) [to do is use some sort of a common](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=96.83499999999994) [database that can be on all your different](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=99.98499999999989) [servers eventually for a writable copy of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=102.33500000000004) [your shared table so it starts off on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=104.33500000000008) [initial server with some common tables](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=106.9665789473684) [that all your other databases are going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=108.86131578947364) [have to have access to. And then what you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=111.38763157894728) [can do is perhaps use transactional](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=114.45264705882356) [replication to replicate that common](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=116.57029411764712) [database or some of the tables from it to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=118.335) [the other databases on the other servers,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=120.90642857142862) [and that way you can avoid having to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=122.90642857142866) [cross-database and cross-server joins,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=126.18115384615386) [which often perform very poorly. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=128.02730769230772) [there's lots of little tricks you can do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=130.57309523809525) [to make SODA work better, and SODA is the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=132.47785714285718) [first step that usually you go along when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=134.62071428571434) [you're trying to do scale out using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=140.335)[engineering techniques rather than product features.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=5&mode=live&start=147.335)

[Data Dependent Routing (DDR)](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live)

[Data Dependent Routing, or DDR. This is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=2) [another engineering technique you can use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=4.7076) [to horizontally partition your database,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=7.0284) [so it's sometimes called "sharding. " So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=8.860823529411766) [you take a monolithic database and split](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=11.331411764705887) [it into multiple databases that eventually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=13.802) [will live on different servers, and that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=16.052)[what gives you your scale-out capability.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=18.677) [Now the application is going to have to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=20.591473684210527) [know how to find the data that it needs on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=22.696736842105267) [whatever server it's living on, and the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=25.601999999999997) [resources between the different database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=28.401999999999987) [servers have to be balanced as your load](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=30.40199999999998) [changes and grows over time, so certain](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=33.01252631578947)[parts of your application might be hotter](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=35.22305263157896) [than others, and you have to have some way](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=37.27819047619048) [of balancing things out so that one node](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=39.42104761904765) [is not working really hard while the other](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=41.325809523809575) [ones are idle. The engineering and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=43.696736842105274) [development to do this is a lot more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=45.59147368421055) [difficult than SODA, but once that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=48.24644444444444) [engineering work is done then it's really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=50.9131111111111) [easy to add more commodity database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=54.0242222222222) [servers and get more and more scale-out.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=56.39023529411765) [And it's really important that you use a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=58.449058823529434) [hashing mechanism to allocate the data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=60.802) [between the servers so you don't just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=63.052) [divide your customers in half, for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=65.677) [example, to split them on two servers, you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=67.45417391304349) [have to have a way so that as you add more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=69.19330434782611) [and more customers the servers have an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=71.58460869565222) [even number of customers, and as you add](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=74.01252631578946)[another server you have a way of balancing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=76.95989473684206) [things out between all three servers, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=79.63533333333332) [hashing is the best way to do that. And to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=81.57977777777772) [read more about this, there's an excellent](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=84.39023529411766) [white paper called "Scaling out SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=86.44905882352944) [with Data Dependent Routing" that you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=88.50788235294122) [get at this link. This diagram shows an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=91.20200000000004) [example of how you might architect a DDR](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=94.64815384615387) [implementation. So you've got multiple](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=98.34046153846161) [data servers at the bottom, and your data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=100.06515789473683) [is spread across those servers using a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=102.59147368421047) [hashing mechanism. And every time a user](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=104.802) [or the application makes a request it has](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=107.25199999999997) [to go and figure out where that data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=110.05199999999992) [lives, and you can use some sort of a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=112.702) [middle tier caching mechanism to do that,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=115.40199999999997) [or you can have that in one central login](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=117.50199999999995) [server, but you have to have some way so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=119.802) [the application knows how to find its](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=122.052) [data. And this is fairly difficult to do,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=124.002) [but once you've done all that engineering](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=126.40199999999997) [work then you can add additional data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=128.50199999999998) [servers very easily and very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=130.91964705882347) [inexpensively, and that gives you almost unlimited scale-out capability.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=6&mode=live&start=132.68435294117637)

[Scale Out Realities to Remember](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live)

[Scale Out Realities to Remember. Scaling](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=2) [out is a lot more difficult than scaling](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=4.1972000000000005) [up. It's going to require some talented](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=7.126800000000001) [engineering resources and time, so it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=9.368) [really important that you don't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=11.243) [underestimate the time and the effort](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=12.756157894736843) [that's going to be required to actually go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=14.335105263157898) [through a scale out exercise, whether](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=16.440368421052636) [you're using the built-in features of SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=18.118) [Server or some of the engineering](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=20.3055) [techniques we talked about earlier. The](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=22.1805) [extra engineering costs may end up](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=24.0555) [outweighing the capital cost savings that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=25.9305) [you would get by scaling out instead of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=27.793) [scaling up. So you need to plan carefully](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=30.193000000000005) [as you're doing this so that you minimize](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=32.593) [your SQL Server license costs, those can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=35.15966666666668) [be extremely expensive, and if you're not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=37.49300000000003) [thinking about that, that can outweigh you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=39.82633333333334) [our capital cost savings. So if you go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=42.15966666666669) [through all this and have the resources to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=44.40209090909091) [do it, then it's going to let you handle a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=46.22027272727272) [much larger overall workload than you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=48.493) [do by just scaling up, because you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=51.44036842105262) [limits to scaling up, but if you've gone](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=54.80878947368418) [through done scaling out properly, you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=57.86352631578948) [scale out much, much further and handle a huge load.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=7&mode=live&start=60.26194736842106)

[Module Summary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live)

[So what did we cover in this module? We](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=2) [talked about AlwaysOn availability group](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=4.5075) [replicas and how they give you some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=5.900555555555556) [limited scale out capability. Then we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=7.9525) [talked about transactional replication and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=9.8275) [how you can get some scale-out capability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=11.39) [with that feature. Then we discussed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=14.157857142857145)[peer-to-peer replication and how that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=16.729285714285716) [works for some scale-out capability with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=18.814999999999998) [some limited writable capability built](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=21.21499999999999) [into it. Then we discussed distributed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=23.214999999999982) [partition views, and then finally two](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=25.681666666666672) [engineering techniques. The first one was](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=28.18166666666668) [service-oriented database architecture, or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=30.614999999999995) [SODA, and then we talked about](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=32.21499999999999) [data-dependent routing, or DDR, and how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=34.61499999999998) [those can be used to do scale out and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=36.59394736842106) [they're engineering techniques, and not product features.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m7&clip=8&mode=live&start=39.436052631578974)

[New Scalability Features in SQL Server 2014](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live)

[Introduction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live)

[New Scalability Features in SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=0) [2014. In this module we're going to talk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=4.714285714285714) [about some of the new features that were](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=7.000000000000001) [added to SQL Server 2014 that can help](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=8.714285714285714) [performance and scalability. The first one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=10.833333333333332) [is buffer pool extensions. Then we'll talk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=13.333333333333329) [about resource governor enhancements and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=16.285714285714285)[we'll talk about columnstore clustered](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=18.42857142857142) [indexes. Next we'll discuss delayed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=20.571428571428555) [durability, and then finally we'll talk about the new cardinality estimator.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=0&mode=live&start=25)

[Buffer Pool Extensions](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live)

[One of the new scalability features in SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=1.963) [Server 2014 is buffer pool extensions, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=4.407444444444443) [what this feature lets you do is extend](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=6.5463333333333305) [your buffer pool with non-volatile storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=9.407444444444446) [that's in your file system, so you enable](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=11.740777777777781) [it and you create a cache file in your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=14.812999999999999) [file system that stores clean pages from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=17.963000000000005) [your buffer pool. And when you do this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=20.413000000000014) [it's really important that you use fast,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=23.227705882352936) [local flash storage for this. Microsoft](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=25.698294117647045) [doesn't restrict your ability to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=27.726157894736843)[something else, so if you wanted to, you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=29.3051052631579) [could put this on a thumb drive or on a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=31.410368421052638) [really slow magnetic drive, and Microsoft](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=34.17728571428571) [is not going to stop you from doing that,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=35.89157142857142) [and that would really be a bad thing from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=38.463) [a performance perspective. Now this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=40.713) [feature works best for random read I/O's,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=42.199842105263166) [so if you've got a storage area network](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=44.77878947368424) [that's using magnetic storage and its](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=47.7261578947369) [random read I/O performance is very poor,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=50.14721052631578) [then if you have a local flash storage](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=53.0945789473684) [device that you have your cache file on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=56.463) [you might see better performance in some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=58.963) [scenarios. And this is most useful with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=61.1505) [SQL Server Standard Edition. If you have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=63.58064705882352) [SQL Server Enterprise Edition, then you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=66.05123529411767) [really better off, if at all possible, if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=67.98931578947366) [your hardware supports it, just to add](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=70.09457894736835)[more memory to the machine and making your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=71.9366842105262) [real buffer pool larger, but with Standard](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=74.12966666666662) [Edition you're stuck with that 128 GB](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=76.07411111111102) [memory limit, so if you've already put](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=78.19984210526314) [that much memory in your machine and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=80.77878947368417) [you're still seeing issues with memory](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=83.3577368421052) [pressure, then BPE might help with some workloads.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=1&mode=live&start=87.463)

[Demo: Buffer Pool Extensions](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live)

[In this demonstration I'm going to talk](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=2) [about buffer pool extensions or BPE. This](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=4.479615384615384) [is a new feature that was added to SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=6.832272727272728) [Server 2014, and it came kind of late in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=8.877727272727272) [the development cycle, and they actually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=10.923181818181812) [added it to both Enterprise Edition and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=12.605000000000002) [Standard Edition. And what this lets you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=14.93833333333334) [do is you can create a cache file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=17.033571428571427) [somewhere in your file system that SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=19.319285714285705) [Server uses as a caching area for clean](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=21.319285714285698) [buffer pool pages, so data that's been](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=24.40499999999999) [read in off your I/O subsystem that hasn't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=27.20499999999998) [been changed can live in this cache file.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=30.17642857142857) [So you would think that you might be able](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=32.46214285714285) [to check sys. configurations and see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=35.03357142857141) [whether or not this enabled, but when you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=37.005) [check it here it's not in the list, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=39.805000000000014) [that's a little bit unfortunate, you can't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=42.855) [tell whether or not BPE is enabled or not](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=44.605) [from running this query where you might](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=46.855) [want to look in the first place. So what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=48.69590909090909) [you actually have to do is check this new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=51.15045454545455) [DMV, sys.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=53.605) [dm\_os\_buffer\_pool\_extension\_configuration,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=54.747857142857136) [and you can pull back these columns from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=55.319285714285705) [it and see what's going on with your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=59.89071428571426) [buffer pool extension configuration. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=63.18394736842106) [when you run this it shows you that it is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=64.7628947368421) [enabled, and here is where the caching](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=67.97342105263158) [file is located, and here's how large it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=70.5523684210526) [is in GB. So once you've done that, then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=73.49973684210521) [you can, actually if it's not enabled you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=77.00500000000004) [can enable it with this ALTER SERVER](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=80.20500000000008)[CONFIGURATION command that sets it on and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=83.055) [then puts the path for where the BPE file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=86.20500000000003) [needs to be, and I'm not going to do that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=90.25500000000005) [on my system since it's already enabled,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=93.19590909090914) [but the rule here is that the BPE cache](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=94.78681818181828) [file has to be at least as large as your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=97.00500000000001) [max server memory setting on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=101.00500000000007)[instance, that's the first rule. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=103.4050000000001) [if you're using SQL Server Standard](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=105.71611111111109) [Edition, which is the only edition you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=107.38277777777772) [really want to use this feature with in my](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=109.32722222222212) [opinion, then the limit is the cache file](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=111.78681818181813) [can't be any larger than four times your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=113.96863636363626) [max server memory setting. So if I needed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=116.24136363636363) [to enable it, I would do it with this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=118.78681818181813) [command right here. And then after that,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=121.65045454545445) [you want to generate some activity on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=123.86815789473683) [system that forces SQL Server to actually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=126.39447368421047) [use that caching file, and frankly, that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=128.605) [can be pretty difficult unless you do some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=131.18394736842112) [things to make SQL Server have to use that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=134.13131578947383) [caching file. So the main thing I like to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=137.12673913043483) [do for demo purposes, is I set my max](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=139.86586956521754) [server memory to an artificially low](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=142.605) [limit, so then when I run lots of queries](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=144.60500000000005) [and try to make SQL Server use that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=147.60500000000013) [caching file it doesn't have as much of a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=150.24136363636362) [real buffer pool to use, which it would](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=153.10499999999993) [prefer to do if it had that available. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=155.65045454545444) [I've previously run some workload against](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=158.31928571428566) [my system to try to get it to use that BPE](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=160.03357142857132) [file, and then after I've done that, then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=163.36690476190475) [I can run this query to see which](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=166.41452380952379) [databases are using the BPE file, and how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=169.46214285714282) [much space in that BPE file they're using,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=172.10500000000005) [and then the average read time in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=174.50500000000014) [microseconds for pages in this database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=176.605) [that are being read from that caching](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=179.605) [file. So that's sort of a way of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=183.105) [confirming that, yes, we've gotten SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=186.40500000000003) [Server to actually use that caching file.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=188.80500000000006) [And then finally, if you decide you want](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=191.605) [to disable BPE and delete that cache file,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=193.605) [you just run ALTER SERVER CONFIGURATION](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=195.605) [SET BUFFER POOL EXTENSION OFF, and that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=197.50499999999997) [will turn off BPE and get rid of that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=200.6549999999999) [caching file. So the important thing to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=204.70499999999979)[remember about all of this is that BPE can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=206.92078947368424) [help some workloads, and some workloads it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=209.28921052631588) [doesn't really help with, so you really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=211.00499999999997) [need to test it with your workload and see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=212.4049999999999) [if it's going to help your performance or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=214.20499999999979) [not. And also, it's really, really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=216.4997368421053) [important that you have this BPE file on a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=218.39447368421062) [fast local flash storage device, because](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=221.4471052631579) [Microsoft doesn't prevent you from putting](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=223.97342105263166) [it on a thumb drive or a really slow](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=226.49973684210542) [magnetic drive, and that would really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=229.40499999999994)[defeat the whole purpose of the feature if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=230.60499999999988) [you did that, but there's no check in place to prevent you from doing that.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=2&mode=live&start=232.20499999999979)

[Resource Governor Enhancements](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live)

[Another new feature in SQL Server 2014 is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=2) [the resource governor enhancements that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=4.5040000000000004) [they added. This adds the ability to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=6.068999999999999) [control physical I/O limits per volume in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=8.695000000000002) [a resource pool, and this lets you set the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=11.495000000000005) [minimum and maximum IOPS per volume. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=15.106764705882354) [this makes Resource Governor much more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=17.98911764705882) [powerful and useful, and it's one of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=20.459705882352928) [most requested features to Resource](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=22.64738095238095) [Governor over the years, so it's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=23.5997619047619) [be a lot more useful of a feature now. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=25.123571428571417) [in my experience not too many people have](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=27.905526315789462) [used Resource Governor before, but I think](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=30.431842105263133) [more people are going to use it now that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=34.695) [you actually have some control over I/O with this feature.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=3&mode=live&start=43.695)

[Demo: Resource Governor Enhancements](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live)

[In this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=2) [the new capabilities that were added in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=3.732111111111112) [SQL Server 2014 for Resource Governor to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=5.464222222222224) [let you control I/O. So what we need to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=7.681272727272727) [is make sure and run the master database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=11.77218181818181) [here, and then we'll come in and create a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=15.044909090909076) [resource pool with the resource limits](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=17.3587619047619) [that we want, and in this case we're just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=18.787333333333322) [going to assign min IOPS for volume and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=20.954) [max IOPS for volume, so we'll create the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=22.954) [resource pool first. Then we'll come in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=24.954) [and create a workload group that uses that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=27.453999999999994) [resource pool, so that's the next step.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=30.653999999999982) [Then the next thing we want to do is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=33.454) [create a classifier function in the master](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=35.704) [database that's a scalar user-defined](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=37.454) [function that's going to route the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=39.45399999999999) [connections from a particular login into](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=41.853999999999985)[that resource workload group that we just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=44.31114285714286) [created, so we do that. Then the next step](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=47.311142857142876) [is you actually have to assign that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=50.78733333333334) [CLASSIFIER\_FUNCTION to the resource](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=53.12066666666669) [governor with this command. Then finally](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=54.454000000000036) [you've got to ALTER RESOURCE GOVERNOR](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=57.254000000000005) [RECONFIGURE to actually enable those](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=60.85400000000001)[changes. Then we're going to check and see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=63.85400000000002) [what is the configuration for the resource](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=66.29610526315784) [governor in memory, and that shows you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=68.13821052631569) [that we've got that function name and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=70.15988235294118) [place, and what the I/O's are set to. Then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=72.63047058823534) [we'll see what the stored configuration is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=75.83861538461538) [with this slightly different query. Then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=78.53092307692309)[we actually have to create a special login](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=80.7697894736842) [that's going to be used by that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=83.29610526315784) [classifier\_function to let certain logins](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=85.50663157894728) [use that resource governor we just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=87.34288888888888)[created. So this is a SQL Server login](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=90.00955555555554) [called LimitedIO. After that, we're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=93.56511111111108) [to create a LimitedIO user in a database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=95.71715789473681) [and associate with that login we just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=98.24347368421046) [created for SQL Server. Then we're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=100.454) [to switch to a database I've already got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=103.33635294117643) [in place. You can use any database you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=106.63047058823521) [want to if you want to play with this on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=108.49747826086958) [your own, just make sure that it's got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=110.23660869565224) [some decent amount of data in it. So we'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=111.78733333333332) [switch to that database, and we'll run SET](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=114.78733333333328) [NOCOUNT ON, and CHECKPOINT, and DBCC](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=117.45399999999991) [DROPCLEANBUFFERS just to make sure that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=119.45399999999998) [we're not going to be pulling data from](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=121.45399999999995) [the buffer pool, rather we want to make it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=124.12066666666658) [come from the I/O subsystem, you wouldn't](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=126.454) [want to do that in production. Then we'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=128.204) [see how big this table is that we're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=130.3915) [to be playing with. So it's a decent](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=133.204) [amount of data, about 1. 5 GB. And we'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=135.67139130434788) [do a Select COUNT (\*) and use this index](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=138.4105217391306) [\_\_\_\_\_ to force it to do a clustered index](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=141.1496521739133) [scan or a table scan, and this is going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=144.363090909091) [take roughly 2-3 seconds with no I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=147.99945454545474) [throttling. So it took almost 3 seconds on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=150.27218181818185) [my machine and I've got a pretty decent](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=152.4540000000001) [SSD on here. So that's what it works like](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=154.63581818181834) [without resource governor in place. So now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=157.34873684210532) [we switch over to this other connection](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=159.55926315789486) [and we've got to make sure that we change](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=161.76978947368423) [our connection to use that SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=164.6118947368422) [login that we just created. So it's called](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=166.82242105263174) [LimitedIO and we logged in as that, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=169.25400000000008) [we'll run this query to make sure that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=171.65400000000017) [we're using that login, even though we can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=173.92458823529415) [see it down here at the bottom. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=175.80694117647073) [we'll make sure that we're on the Resource](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=178.08557894736845) [Governor test database and do SET NOCOUNT](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=180.6118947368422) [ON, and CHECKPOINT, and DBCC](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=182.82242105263174) [DROPCLEANBUFFERS to make sure we're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=184.62066666666666) [to force it to read from the I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=186.95399999999998) [subsystem. Then I'll run that exact same](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=190.06511111111107) [query against the same database with this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=192.21870588235288) [different login that's using Resource](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=194.27752941176456) [Governor to throttle the I/O. And this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=195.854) [going to take roughly 14 seconds since we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=199.05400000000006) [put the I/O limit fairly low for this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=202.2540000000001) [resource governor right now. And so it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=205.6762222222223) [almost done, and it's going along, and now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=208.7873333333335) [finally finished, and so then we can run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=211.954) [some queries to see what's been going on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=213.954) [with the resource governor resource pools.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=215.954) [So this shows you the default pool that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=217.954)[everything that's not going into that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=220.954) [resource governor that we just created](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=223.05400000000003) [uses, and then the limited I/O pool, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=224.8540000000001) [you can see some stats for what that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=227.2540000000002) [been doing. And then we've got another](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=229.78733333333338) [query that's looking at the resources pool](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=232.12066666666678) [volumes and seeing what they are doing. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=234.454) [on the C Drive and the T drive you can see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=236.9994545454545) [what's happened to those because we've got](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=240.49945454545446) [that database spread across the C and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=242.71715789473689) [we've got \_\_\_\_\_ on the T Drive. And then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=245.24347368421064) [we can find out what sessions that are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=248.204) [active are in each workload group. So the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=251.204) [LimitedIOGroup is right there and it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=254.18127272727276) [using spid 56. And then we can come in and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=256.363090909091) [change the resource governor properties](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=260.03294736842093) [and raise the I/O limit to 500, so we'll](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=261.87505263157874) [do that. And then we'll run the same exact](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=265.09036363636363) [test again, but we have a higher I/O limit](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=267.95399999999995) [now, so when we do this, this should take](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=270.81763636363627) [roughly 8 seconds since we gave it more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=273.6415) [I/O. And, again, the reason you're doing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=276.1415) [this is you've got maybe some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=278.57164705882366) [administrative users that are running](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=280.6892941176473) [reports and they're putting a big load on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=282.454)[your system, so you want to limit the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=284.35876190476193) [amount of I/O that they can use, so you go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=286.26352380952386) [in and create a resource governor like](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=289.2040000000001) [this and assign their login to that group,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=291.6540000000003) [and then you're in good shape, you can control how much I/O they have.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=4&mode=live&start=294.454)

[Clustered Columnstore Indexes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live)

[The next new useful feature in SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=2) [2014 is clustered columnstore indexes, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=4.926588235294119) [this is only available in Enterprise](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=7.121529411764708) [Edition, but this uses column-based data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=9.419) [storage and query processing to sometimes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=11.819000000000003) [get orders of magnitude better performance](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=14.219) [on certain kinds of queries. It's very](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=16.40081818181818)[well suited for very large reporting](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=19.042529411764704) [queries and working with large data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=21.513117647058813) [warehouse fact tables, and what's really](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=23.983705882352922) [nice about this feature now is that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=26.218999999999998)[they're updatable. The previous version of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=28.552333333333323) [columnstore indexes in SQL Server 2012 was](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=30.63076470588235) [not updatable, so that made them much less](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=33.10135294117646) [useful. This feature is going to see a lot more usage in SQL Server 2014.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=5&mode=live&start=37.219)

[Demo: Clustered Columnstore Indexes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live)

[For this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=2) [you how to compare the performance of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=3.8445000000000005) [clustered columnstore indexes to regular](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=5.688999999999998) [row store indexes, both with and without](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=7.716) [data compression. So in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=11.216) [AdventureWorks2014, we're going to use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=13.039529411764706) [that database, and I created another table](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=15.098352941176472) [on there called bigTransactionHistory, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=17.980705882352936) [I've got three different copies of that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=19.985230769230768) [table in the database. The first one just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=22.67753846153845) [uses row store with no data compression,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=25.416000000000004)[so it's got a clustered index and no data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=27.51600000000001) [compression involved. The second one is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=30.216) [the exact same table and I took and did](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=32.110736842105254) [PAGE data compression on the clustered](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=34.952842105263166) [index. And then I copied that table and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=36.952842105263166) [I've got a clustered columnstore index on](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=39.900210526315824) [this table. That's the only difference,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=42.4791578947369) [the data is exactly the same, and you can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=44.41599999999999) [use any large table and any big database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=47.115999999999964) [you have access to, to do similar testing.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=49.466) [And we want to make sure to turn on the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=51.466) [graphical execution plan so we can see](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=53.966) [what's happening with this. So we'll turn](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=56.110736842105275) [that on right there and then we'll turn](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=58.32126315789476) [STATISTICS IO ON and SET NOCOUNT ON, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=60.95284210526315) [do a CHECKPOINT and DBCC DROPCLEANBUFFERS](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=63.90021052631575) [to make sure there's nothing in the buffer](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=66.11073684210521) [pool and we're reading it from the I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=68.64457142857145) [subsystem. So we'll do all that, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=70.93028571428579) [we're going to come down here and we've](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=73.42652631578943) [got three separate queries. The first one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=75.95284210526307) [is going to do a SELECT COUNT(\*) AS (Row](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=78.11599999999999) [Count) from the table with this hint to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=80.81599999999996) [force it to do a clustered index scan, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=83.216) [we've got some timing code in here. And we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=86.591) [do the same thing down here on the second](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=89.716) [table that's using page compression, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=91.966) [then the same thing down here on the third](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=93.466) [table that's using the clustered](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=96.06215384615383) [columnstore index. So we want to run all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=97.60061538461537) [of this in a batch, and we're going to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=99.96600000000002) [this and then look at the I/O statistics](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=102.88266666666674) [and the batch cost and everything after](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=105.216) [it's done. So this takes about 6 or 7](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=107.21600000000004) [seconds to run this entire batch, and when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=109.78742857142866) [it comes back you'll see we've got 62](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=112.1535) [million rows in each table. The elapsed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=114.6535) [time for the first query was about 4. 4](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=117.016) [seconds roughly, this was slightly less](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=120.61600000000006)[than 2 seconds with page data compression,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=123.01600000000009) [and this was 140 milliseconds with a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=125.93028571428572) [clustered columnstore index. And if we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=128.9302857142857) [switch over to the graphical execution](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=131.00547368421056) [plan you can see the batch cost of each](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=132.58442105263165) [query, so 66%, 32%, and 3%, so that's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=134.9528421052633) [pretty big difference there. And we can,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=139.02552380952386) [again, see the I/O statistics here and we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=142.35885714285723) [can see 594 logical reads with a clustered](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=146.26863157894735) [columnstore index, the page data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=150.47915789473672) [compression is 120000 reads, and then with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=153.11073684210507) [no data compression 287000 reads, so a huge difference in the amount of I/O.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=6&mode=live&start=158.216)

[Delayed Durability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live)

[The next improvement in SQL Server 2014 is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=2) [delayed durability. Now this is a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=4.7515) [database-level property that you can set](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=6.815125) [to help alleviate log write waits when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=8.976684210526315) [you're doing lots of writes to your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=11.555631578947366) [transaction log file. It uses asynchronous](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=14.134578947368418) [log writes to the disk after the log block](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=16.345105263157894) [fills up, and this sometimes can alleviate](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=19.660894736842103) [the bottlenecks that you're seeing when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=22.091235294117645) [you're trying to write to your transaction](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=23.85594117647058) [log file. Now it's possible to see some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=25.914764705882337)[data loss for committed transactions that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=28.251999999999995) [don't fully get written to the disk if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=30.00099999999999) [something happens before they do get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=32.2753) [written to the disk, so make sure you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=33.851200000000006) [aware of the risks involved with this, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=35.95240000000001) [in some scenarios, this can be a really nice performance boost.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=7&mode=live&start=41.003)

[Demo: Delayed Durability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live)

[In this demo we're going to look at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=2) [delayed durability feature in SQL Server](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=4.7016874999999985) [2014. Now this feature is available in all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=6.502812499999997) [editions of SQL Server, including Standard](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=8.45005882352941) [Edition, so that makes it a lot more](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=9.861823529411758) [useful. And what you can do with this is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=11.893909090909094) [take a look at what's going on with your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=14.348454545454555) [delayed durability setting for all the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=16.803) [databases on the instance, and we see that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=18.603000000000005) [most of them have it set to the legacy](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=21.00300000000001) [default setting of DISABLED, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=24.202999999999996)[AdventureWorksLT2008R2 is set to ALLOWED,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=26.53633333333332) [and then DelayedDurabilityTest is set to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=28.869666666666646) [FORCED right now. So then the next thing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=30.85563157894737) [we want to look at is here's how you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=32.96089473684211) [actually change the settings, so it's an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=35.50888235294117) [ALTER DATABASE command for a particular](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=37.97947058823528) [database, and you set DelayedDurability to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=40.0971176470588) [DISABLED, that's the default legacy](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=42.231571428571414) [setting, which means that all transactions](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=44.017285714285684) [are fully durable. And then the next](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=46.19188888888888) [setting you can try is ALLOWED, and that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=48.91411111111108) [means that individual transactions can use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=52.02522222222217) [DelayedDurabilty if you use the proper](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=54.51728571428572) [command in an explicit transaction in a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=57.0887142857143) [T-SQL transaction. And then the next](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=59.87442857142856) [setting is this one here, and this one is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=62.017285714285684) [DELAYED\_DURABILITY -- FORCED, which means](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=65.303) [that all transactions will use delayed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=67.178) [durability and the transaction level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=69.428) [setting is actually ignored. And so here's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=71.40300000000002) [the transaction level setting. When you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=74.20300000000006) [commit a transaction you just have to say](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=76.46966666666665) [WITH (DELAYED\_DURABILITY = ON), and that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=79.13633333333328) [makes it use delayed durability when](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=81.13633333333325) [you're using this ALLOWED setting for the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=83.34146153846154) [database level. If you're using this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=86.03376923076925) [setting, it ignores this and they're all](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=87.7260769230769) [delayed durable. And then the other thing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=89.34146153846149)[you want to think about here is there's a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=91.11878947368417) [new system stored procedure called](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=93.48721052631569) [sp\_flush\_log that lets you flush the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=94.803) [transaction log and harden any committed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=98.23157142857141) [delayed durability transactions when that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=101.66014285714283) [happens. So if you're concerned about data](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=103.80299999999998) [loss, which is definitely something to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=106.13633333333328) [think about if you're going to use the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=108.13633333333333) [delayed durability feature, you can run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=110.80299999999995) [this command periodically to reduce the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=112.80299999999993) [amount of data that you might lose, but if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=114.4848181818182) [you run this too often it's going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=116.5302727272728) [pretty much erase the performance benefit](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=118.34845454545467) [of using this feature, so just something](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=119.94585714285716) [to think about. Now these are three good](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=121.94585714285721) [web post articles that you can read and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=124.64510526315787) [get more details about this feature. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=127.59247368421047) [moving on to the actual demo part of this,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=130.03027272727272) [what we're going to do is we're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=132.0757272727272) [create a database and then do some tests](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=134.12118181818167) [with it, inserting data as fast as](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=136.55299999999997) [possible to see the effect of delayed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=139.00299999999993)[durability. So the first thing we're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=141.4529999999999) [to do is drop this database if it exists.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=143.40300000000008) [So we'll do that, and that works, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=145.803) [we're going to create the database and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=148.053) [we're going to make the transaction log](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=149.803) [file relatively large so we don't have to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=151.75036842105266) [worry about growing it during our insert](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=154.2766842105264) [test. So we'll go ahead and create a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=156.48721052631595) [database, and then we're going to switch](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=158.46966666666668) [and make sure we're using that new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=160.13633333333337) [database, and we're going to create one](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=161.803)[table, and it has just three columns in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=164.7503684210527) [it, an IDENTITY column, and a varchar(20),](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=168.1187894736844) [and then another integer column here, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=170.96966666666665) [the primary key is on this IDENTITY](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=173.69188888888885) [column, so that's pretty standard, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=176.41411111111105) [we'll do that. And then we're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=178.053) [come down here and for the first run of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=180.053) [this test we're going to set this to be](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=182.40300000000002) [fully durable so it's a legacy setting](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=185.10300000000012) [without using delayed durability. So we do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=187.2030000000002) [that, and then we're going to have a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=189.053) [little loop here where we're going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=191.053) [clear out the wait statistics, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=192.803) [we're going to initialize some variables,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=195.27358823529406) [and then loop through and insert a row](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=197.39123529411754) [into this table 500000 times, and we've](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=200.13633333333337) [got some timing code in here to see how](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=202.46966666666677) [long this actually takes, and then we're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=205.46966666666685) [going to check the wait statistics and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=207.69773684210531) [we're also going to check the I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=209.90826315789485) [statistics by file for that current](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=212.13633333333334) [database. So that's what the test run is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=214.1363333333334) [going to do. And when I run this it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=216.80300000000014) [going to take roughly 30 seconds on my](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=219.69773684210531) [machine to do this test. So while that's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=222.22405263157907) [running, we can pull up Task Manager and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=224.59247368421055) [see what's going on here, and we're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=226.69773684210534) [running about 11-12% most of the time in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=228.5398421052633) [CPU, and we're just as fast as we can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=231.8029999999999) [inserting rows into this database. And](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=235.66014285714266)[what's going on underneath the covers is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=238.053) [we're running some write log wait types](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=239.803) [while this is going on, and when this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=241.553) [finishes in a few seconds we'll be able to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=243.66014285714283) [look at the wait stats and the I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=246.23157142857133) [statistics for each file in this database.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=248.51728571428555) [So it should be done in just another](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=249.94585714285722) [second or 2 here, and then we'll take a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=251.46966666666685) [look at it. And what happened here is it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=253.46966666666668) [took nearly 31 seconds, the elapsed time](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=256.46966666666674) [is in milliseconds. And then here's our](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=258.80299999999994) [cumulative wait stats, and the only thing](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=260.9141111111111) [that's really showing up here is WRITELOG.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=262.8585555555555) [And my log is on an SSD on my workstation,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=264.803) [so even with that we're still running into](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=267.6601428571428) [write log waits as we rapidly try to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=269.945857142857) [lots of small inserts into this table. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=273.11069230769215) [we had a lot of waits here, and spent a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=276.0638695652174) [lot of time waiting on that particular](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=278.67256521739114) [wait type, and then looking down here we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=280.4986521739128) [can see what's going on with lots of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=282.59247368421046) [writes and the total number of megabytes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=284.69773684210503)[written. So going back to this, we're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=286.5398421052628) [going to basically repeat all this, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=288.60300000000007) [we're going to blow away the database and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=290.70300000000015) [create it again so we get fresh stats, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=293.07572727272725) [it's important that I use the master](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=295.5302727272725) [database when I do this. And so now we're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=297.4393636363633) [going to drop the database and we're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=299.75538095238096) [to create it again, and then we'll go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=301.6601428571429) [through and do all the other steps, create](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=303.5649047619048) [the table, and make sure you switch that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=306.428) [database. And then we're going to set](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=309.428) [DELAYED\_DURABILITY to FORCED, which makes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=312.60299999999984) [all the transactions use delay durability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=314.93633333333304) [without you having to make any code](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=317.1839523809524)[changes like you have to do when you set](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=318.51728571428583) [it to ALLOWED. So we change that, and then](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=320.23157142857167) [we come down here and we're just going to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=322.7120909090909) [run this entire test again and this should](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=325.5757272727272) [go significantly faster. So when we run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=328.1187894736842) [this we can pull up Task Manager if we're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=330.32931578947375) [fast enough, and we see that the CPU is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=333.17142105263173)[running a little bit hotter, which](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=335.9030000000001) [indicates that we're not waiting as much](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=337.70300000000015) [on the disk so it lets the CPU run a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=339.803) [little hotter there. And looking at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=342.41169565217376)[stats here we came in at about 6. 5](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=344.2377826086954) [seconds, which is nearly 5 times faster.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=346.75036842105266) [And we have some different kinds of waits](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=348.9608947368422) [involved now, so we've got PAGEIOLATCH\_SH,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=351.48721052631595) [and we've got some other things besides](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=353.9905) [WRITELOG, so that changes where the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=357.053) [bottleneck is by doing this. And we also](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=359.53027272727275) [see that we have a lot fewer writes and a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=362.43936363636374) [lot fewer MB written. And if we go back](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=366.0757272727275) [and look at the results from when I ran](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=368.9334347826086) [this before, you can kind of see a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=371.672565217391) [comparison, so almost 5 times, about 4. 5](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=374.1839523809524) [times faster to do it with delayed](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=377.23157142857167) [durability, and a lot fewer writes to the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=379.8982380952385) [transaction log, and then we see a fewer](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=382.70300000000003) [total number of megabytes written to the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=385.1030000000001) [transaction log. If you have the right](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=387.2030000000002) [kind of workload where you're actually](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=389.1187894736841) [running into write log waits and you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=390.69773684210503) [doing lots of small inserts, and you're](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=392.5398421052628) [actually seeing a bottleneck there, this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=394.92064705882365) [setting could have a huge effect on your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=397.0382941176473)[performance, but just keep in mind there's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=399.5172857142857) [a chance of some data loss so you need to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=401.1839523809524) [think about that and consider whether you really want to do this or not.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=8&mode=live&start=403.5649047619048)

[New Cardinality Estimator](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live)

[Another big change in SQL Server 2014 is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=2) [the new cardinality estimator. This new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=5.268000000000001) [cardinality estimator can really help the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=7.679777777777778) [query optimizer to create better query](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=10.013111111111114) [plans in many cases, but unfortunately,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=12.34644444444445) [it's also possible to see very bad](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=14.607882352941177) [performance regressions in some cases, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=17.07847058823529) [it's really important you do a lot of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=19.196117647058813) [testing before you start using this. Now](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=21.402) [this can be controlled by the database](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=23.29088888888889) [compatibility level, or by trace flags, or](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=26.013111111111115) [by query hints, so you have lots of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=28.73533333333334) [different ways of controlling this at](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=31.440461538461534) [different levels. So if you have the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=33.286615384615374) [compatibility level set to 120, it'll use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=35.21778947368421) [the new cardinality estimator, where if](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=37.05989473684211) [it's 100 or older it'll use the old](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=38.638842105263166) [cardinality estimator. You can also use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=41.56866666666666) [trace flag 9481 to force it to use the old](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=43.854380952380936)[cardinality estimator, and you can use](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=47.67977777777777) [2312 to force it to use the new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=50.01311111111109) [cardinality estimator regardless of what](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=53.12422222222217) [your database compatibility level is. So,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=54.8395) [again, it's really important that you do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=56.7145) [very comprehensive workload testing to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=58.902) [make sure that you don't run into some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=60.666705882352936) [queries that perform very much worse with the new cardinality estimator.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=9&mode=live&start=63.49023529411763)

[Demo: New Cardinality Estimator](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live)

[For this demonstration I'm going to show](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=2) [you some of the capabilities of the new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=3.5511176470588235) [cardinality estimator that's part of SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=5.323823529411767) [Server 2014. So we're going to use the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=7.414058823529413) [AdventureWorks2014 database for this demo,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=10.708176470588239) [so let's switch to that database. Then I](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=12.767) [want to point out an excellent white paper](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=15.43366666666667)[called Optimizing Your Query Plans with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=18.10033333333333) [the SQL Server 2014 Cardinality Estimator.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=20.366999999999994) [It was written by my good friend Joe Sack.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=22.767) [I highly recommend that you read that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=25.76699999999999) [white paper. Now query hint 2312 means](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=28.100333333333314) [you're going to use a new cardinality](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=30.531705882352934) [estimator, regardless of what your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=33.00229411764705)[compatibility level is, and query hint](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=34.767) [9481 means you're going to use the legacy](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=37.392) [cardinality estimator. And we want to make](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=40.892) [sure that the graphical execution plan is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=42.95747619047621) [turned on, so we'll come up here and click](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=44.62414285714289) [on that in the toolbar, and then the first](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=46.767) [thing I want to do is find out the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=48.81245454545454) [compatibility level for all my databases.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=50.85790909090908) [So we can see that most of them are in](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=52.40336363636364) [120, which means the SQL Server 2014 using](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=55.585181818181844) [the new cardinality estimator, and that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=58.130636363636405) [includes AdventureWorks2014. So let's just](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=60.17876470588235) [take a look at the data in the address](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=61.943470588235286) [table and see how many cities, how many](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=65.13542105263157) [have London, how many have Paris, that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=68.08278947368417) [just sort of gives us an idea of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=70.6617368421052) [distribution of the data in this table.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=73.61315384615384) [And then we're going to switch](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=75.767) [AdvnetureWorks2014 to the 110](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=78.767) [compatibility level. And then we're going](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=80.767) [to run a query and make it use the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=83.03015789473682) [cardinality estimator because it's in 110](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=85.87226315789466) [compatibility level and we're not using a](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=87.767) [query hint here. So when I run this query,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=89.86699999999998) [we'll run it and then take a look at the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=92.56699999999995) [graphical execution plan and hover over](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=95.267) [this operator, and you can see that the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=96.767) [estimated number of rows is 2. 08, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=98.767) [then the actual number of rows is 202, so](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=101.81461904761903) [that's not a great cardinality estimate.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=105.24319047619045) [So if we force it to use the new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=107.70817647058823) [cardinality estimate or by using the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=111.94347058823527) [QUERYTRACEON 2312 query hint and run that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=114.767) [same exact query, what we should see is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=117.56700000000004) [that when we hover over this operator the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=120.76700000000008) [estimated number of rows is now 20, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=123.66699999999999) [then the actual is 202, so that's a little](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=126.06699999999996)[bit better. So that's an example of the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=128.767) [new cardinality estimator doing a better](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=131.29331578947375) [job of figuring out what is going on with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=133.18805263157907) [the data in that table. So now let's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=136.24068421052635) [switch to the new cardinality estimator](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=139.18805263157907) [with compatibility level 120. So we do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=141.3985789473686) [that, and then now that we're in 120 mode](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=143.76700000000005) [we don't have to use that query hint, it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=146.76700000000014) [just going to use the new cardinality](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=149.92084615384616) [estimator by default. So when we run this](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=152.61315384615386) [query and look at the execution plan and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=155.08278947368424)[hover over this operator, the estimated](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=157.18805263157904) [number of rows is 20. 49 and the actual is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=158.767) [202, so that's what we want. And then we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=162.517) [can force it just for this individual](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=165.71436842105265) [query to use the legacy cardinality](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=167.9248947368422) [estimator by using this QUERYTRACEON 9481.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=169.8196315789475) [So when I run this, this will come back](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=172.03015789473687) [and we can hover over that operator and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=175.8196315789475) [see that the estimated number of rows is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=179.03015789473685) [2. 08, so that's not as good of an](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=181.13542105263164) [estimate. So another interesting thing you](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=183.5038421052633) [can do is run both of these queries back](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=185.26700000000005) [to back in the same batch, and then run](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=187.96700000000016) [this and look at the execution plan, and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=190.76700000000002) [you can see the query costs relative to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=193.43366666666677) [the batch. So it's 56 for the one on the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=196.1003333333335) [top and 44% on the one on the bottom. So](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=199.59052941176463) [that's another interesting way of looking](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=203.04477777777777)[at it, and for this very simple query it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=204.7114444444444) [actually thinks that the legacy](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=207.21144444444434) [cardinality estimator is less costly, but](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=208.76700000000002) [anyways, this is something that you need](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=210.76700000000008) [to be aware of and just test it both ways,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=213.10033333333348) [because some workloads do much better with](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=216.43366666666674) [the new cardinality estimator, and certain](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=218.76700000000014) [queries do worse with the new cardinality](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=220.76700000000002) [estimator, so you have a way to force it](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=223.10033333333342) [at the database level or at the query](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=226.13542105263159) [level with either the compatibility level](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=229.0827894736843)[for the database or query hints for individual queries like you saw here.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=10&mode=live&start=231.29331578947384)

[Module Summary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live)

[So what did we cover in this module? Well,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=2) [we talked about buffer pool extensions and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=4.232450000000001) [how you can use them to improve I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=5.968800000000002) [performance with some types of workloads.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=8.461) [Next we talked about the resource governor](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=10.711) [enhancements that let you control your I/O](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=13.2735) [usage, which can also help your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=15.461)[performance and scalability. Then we](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=17.336) [talked about clustered columnstore indexes](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=19.086) [and how they can be really useful for](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=20.961) [certain types of queries. Then we talked](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=23.961) [about the delayed durability feature and](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=26.294333333333324) [how that can help you alleviate log write](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=28.294333333333316) [waits at the cost of possibly losing some](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=30.960999999999995) [data. Then finally I talked about the new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=33.62766666666667) [cardinality estimator and how that can](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=36.29433333333335) [help many queries, but how you need to do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=38.29433333333336) [some testing to make sure you don't run into any performance regression.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=11&mode=live&start=43.961)

[Where to Go Next and Course Summary](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live)

[Okay, now that you've watched this course,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=2) [where should you go next? Well, it's](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=4.392833333333333) [always a good idea to look for new](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=6.744857142857143) [Pluralsight courses from me. After that,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=9.316285714285712) [you want to look for other courses put out](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=11.227) [by SQLskills on Pluralsight, including SQL](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=14.0395) [Server 2014 DMV Diagnostic Queries -- Part](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=16.046444444444443) [1, SQL Server 2014 DMV Diagnostic Queries](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=19.157555555555543) [-- Part 2, and then part 3 of that same](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=22.268666666666643) [sequence. Then another good course that](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=25.352) [you might want to look at is SQL Server:](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=26.852) [Troubleshooting Query Plan Quality Issues.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=30.03057142857143) [Course Summary. Scaling with SQL Server is](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=33.602) [a very complex subject with multiple](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=36.48435294117648) [system layers that you need to consider to](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=38.95494117647061) [get the best performance and scalability](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=41.83276923076922) [for SQL Server. So this includes your](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=43.67892307692306) [storage subsystem, your hardware, the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=46.20199999999999) [operating system, and SQL Server itself.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=48.201999999999984) [And it's really important that you do](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=50.602) [proper configuration and testing of each](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=52.54644444444445) [one of these system layers in order to get](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=54.21311111111112) [the best performance and scalability out](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=57.03057142857141) [of your entire system. Many of the default](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=59.17342857142854) [configuration options for the operating](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=61.93533333333334) [system, for SQL Server instance settings,](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=63.60200000000002) [and database properties are just not the](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=65.602) [best choices for performance. There are](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=68.14745454545452) [many useful tools available, and many of](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=70.17342857142859) [them are free, that you can use to help](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=72.17342857142863) [check and test your system before you go](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=74.74485714285726) [into production. And, once again, thanks](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=77.36670588235297) [for watching this course, I really appreciate it.](https://app.pluralsight.com/player?course=scaling-sqlserver2012-2014-part2&author=glenn-berry&name=scaling-sqlserver2012-2014-part2-m8&clip=12&mode=live&start=79.48435294117654)

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