## [Course Overview](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3)

### [Course Overview](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3)

[All right then, Docker.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=4.54) [It is changing the world and in a good way.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=7.19) [And believe me, you don't want to miss out.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=10.04) [Well, let me tell you,](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=13.05) [have we got a course for you. Getting Started with Docker is the](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=14.29) [ultimate launchpad for kickstarting your Docker journey.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=19.25) [And it's handcrafted to be perfect for developers,](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=22.62) [operations professionals, and of course DevOps.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=26.81) [But the best part, not only does it take the scary out of learning Docker,](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=30.64) [it actually makes it fun. And when you're done with the course you](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=35.55) [will be pumped and ready to learn more. So, in this course, and](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=39.61) [there'll be plenty of opportunities for hands on, but we'll show you](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=45.88) [some really easy ways to get Docker.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=49.91) [Then, though,](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=52.54) [the beating heart of the course is showing you how to take application](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=53.59) [source code from the GitHub repo, build it as a Docker image, share it](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=57.81) [in a container registry, and then run it as a container. And you'll get](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=62) [your hands on with tools like Docker Compose and Swarm and Stacks that](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=67.2) [all make it easy to manage microservices apps in a modern, declarative](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=71.8) [fashion.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=76.76) [And of course we'll explain what all of those buzz words](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=77.76) [actually mean. Now, what about me?](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=80.77) [Well,](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=84.34) [I'm Nigel, and I've been working with Docker in containers since the early days.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=84.99) [I'm one of the longest‑serving Docker captains, I'm the author of these](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=89.31) [bestselling container books, and of course I've got a ton of courses here on](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=93.39) [Pluralsight and the reviews speak for themselves. But you know what, let's cut the waffle, and let's get learning Docker.](https://app.pluralsight.com/course-player?clipId=6b13bbee-fc55-4a56-ac37-c3a0227000c3&startTime=97.52)

## [Course Introduction](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed)

### [Course Introduction](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed)

[Alright then, here we are.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=1.44) [So thanks for choosing the course, and I'm telling you, it's a good choice.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=5.24) [You're going to love it. Now,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=9.29) [some really quick housekeeping before we start, and I promise it](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=12.04) [will be quick because I'm hoping you won't skip it.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=15.32) [So the whole reason for this course, well,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=19.14) [obviously it's to get you up and running with Docker,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=22.34) [but we're going to do it as fast as possible,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=25.24) [but without leaving your brain fried and totally confused. So,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=28.94) [there'll be plenty of chances to get your hands on, but we'll be](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=33.74) [doing everything we can to explain things as clearly as](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=37.33) [possible, because believe me, right,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=40.52) [I have no interest in you walking away at the end of this course,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=42.33) [and I don't know, maybe recognizing a few of the commands, but inside your head,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=45.89) [you didn't really grasp what was going on.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=51.18) [No chance, right, I have no interest in that.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=53.43) [We will be explaining things.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=55.65) [However,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=59.14) [we've got to keep in mind, this is a beginner's course, so even though, yes,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=60.54) [we'll be explaining stuff as we go, we're not going to be getting into the weeds.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=65.26) [In fact, we've got other courses for that.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=69.39) [And you know what, actually, on the topic of other courses, well,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=73.54) [if maybe you are like 100% a bona fide nube, like, I don't](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=77.44) [know, you have zero idea what Docker is,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=83.71) [and a container is something to hold a beverage, well,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=85.52) [if that's you, you probably want to hit this course first.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=88.44) [It is a proper, absolute zero prior experience necessary.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=92.74) [Anyway, look,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=99.84) [the stuff in this course here is the fundamentals, and](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=100.73) [Docker itself, at its core, is a DevOps tool.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=104.11) [I mean, it was instrumental in the whole early DevOps movement.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=106.96) [Well,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=110.94) [because Docker is a DevOps tool and we are learning the](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=111.39) [fundamentals, everything on the agenda has both a](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=114.42) [developer and an operations element, or it applies equally to both,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=117.83) [which is why we've stuck this course right at the start of the](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=123.24) [developer and the operations learning paths.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=127.14) [Now, we're building these paths out, and I don't know,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=131.54) [I expect that we'll constantly be tweaking them, but the point is,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=135.05) [we've got a developer learning path and on operations learning path,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=138.58) [and this course is the springboard for both.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=143.54) [So, one of the things I'm aiming for is to wrap your head around Docker and](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=147.94) [containers and what they're all about, to give you a chance for some hands‑on](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=151.49) [with some of the cooler aspects, but ultimately, okay,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=155.57) [to lay the groundwork for you to crack on with the other courses](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=158.89) [in the paths that are right for you. However,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=162.2) [and this is good,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=166.76) [right, as well as the learning paths we've also got standalone](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=167.35) [courses that I know you'll love as well. Now,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=171.65) [just a couple right, on the developer side, Dan's got a great](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=174.96) [course called Docker for Web Developers.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=178.53) [Then on the Operations and DevOps side, I've got Docker Deep Dive. And, look,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=181.01) [I could waffle all day, okay,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=187.34) [but you know what, we're adding courses all the time,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=188.56) [so check out the learning paths, for sure,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=191.42) [but also poke around in our standalone courses as well.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=194.55) [You'll just love them.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=197.97) [I don't know, maybe take a note or maybe a screenshot of this or something,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=199.44) [cause I really want you to maximize what you get](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=203.64) [out of Pluralsight as a platform.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=206.24) [So, whatever you do, do not stop after this course.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=209.34) [It is literally the tip of the iceberg.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=214.09) [Anyway, look, who am I?](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=217.34) [Well, like I mentioned in the trailer, I'm Nigel,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=218.91) [and I know some of you know me already,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=221.99) [but for those who don't, I'm a bit of a techaholic.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=224.38) [And I've been working with Docker and Kubernetes for, well,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=227.27) [let's just call it a lot of years, yeah,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=231.32) [like when Docker was really, really new.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=233.13) [In fact, look,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=235.96) [I'm a Docker Captain, though, anybody referring to me as](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=237.04) [captain will be ordered to walk the plank.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=241.77) [Look,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=246.14) [I've got a ton of courses here at Pluralsight, I am the author of these](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=247.01) [bestselling books on containers, and I'm pretty active in the community and](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=250.56) [you'll see me at conferences and meetups and the likes.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=254.39) [Well, actually, speaking of which,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=257.64) [if you do see me anywhere, and I say this all the time,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=259.81) [but I do mean it, if you see me somewhere,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=263.41) [come and say hi.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=266.74) [Like, I might look miserable and unapproachable, but I'm not.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=268.36) [Come and say hi.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=272.77) [Oh, of course, let's connect on the socials as well.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=274.54) [I'm always happy to engage and talk about technology. But, look, talk is cheap.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=277.35) [This is a cracking course,](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=282.14) [and I know you're going to love it, and I know you're going to love Docker as well. So, strap yourself in, and let's get ready to learn.](https://app.pluralsight.com/course-player?clipId=959f70c7-a251-40e6-b4ad-0039ce12d0ed&startTime=283.91)

## [Getting Docker](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a)

### [Module Overview](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a)

[Okay.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=1.14) [I want everything we learn to be as hands on as humanly possible.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=1.88) [Now, in saying that, if you can't follow along in your own lab or,](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=7.24) [I don't know, maybe you just don't want to,](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=11.7) [that's all right as well.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=13.99) [You will still get a ton of good stuff from the course.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=15.13) [I guess all I'm trying to say is that I reckon for maximum](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=19.64) [take‑home value it is best if you can follow along.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=24.32) [Anyway, look,](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=28.14) [if you do want to follow along you are going to](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=28.91) [need Docker. And let me tell you, getting Docker has never been easier.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=30.92) [So, gone are the days of me literally robbing 30, maybe even 40,](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=37.11) [minutes of your time just showing you how to install it.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=43.06) [I reckon today like, I don't know, 5,](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=46.04) [maybe 10, minutes, right, and we will be rocking and rolling with a](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=49.11) [Docker environment that you can totally follow along with.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=53.69) [So, we'll look at two options, Docker Desktop and Play with Docker.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=57.04) [Now, look,](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=62.64) [the aim of the game here is to get you something quick](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=63.37) [and easy so that you can follow along.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=66.82) [We're not aiming for battle‑ready, highly‑available,](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=68.76) [high‑performance, weapons‑grade Docker clusters here.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=72.15) [No, we've actually got courses for that.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=75.1) [But here and now we are getting you a lab](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=77.64) [environment and a pretty good one as well. But you know what, time is money. Let's get this show on the road.](https://app.pluralsight.com/course-player?clipId=3c72ce39-693f-4850-9166-868e3cd5ae1a&startTime=80.57)

### [Docker Desktop](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af)

[Right then, Docker Desktop, and for me,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=1.34) [this is the easiest way to get yourself a Docker](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=4.04) [development environment on your laptop.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=6.81) [And I'm telling you, it is slick as heck.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=9.28) [Well, it works on PC and Mac, and with a few simple clicks,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=13.94) [you're going to be in business.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=17.83) [However, as things stand, if you're a PC user,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=20.14) [you're going to need a 64‑bit version of Windows 10 or later. If you're](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=23.7) [on a Mac, I think the official line is something like the most recent](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=28.9) [version of macOS, plus maybe the two previous.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=33.19) [But you know what?](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=36.48) [Never take my word for it.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=37.57) [Always check the docs. Now as well, while this is about getting you a](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=39.53) [lab as a local testing development environment,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=45.59) [you're actually getting the full Docker experience.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=48.5) [Pretty cool, right?](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=51.51) [So it is brilliant for, let's say, developers coding your apps,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=53.34) [as you do with whatever tools you have on your laptop in your favorite](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=58.98) [languages, only now you're adding the tools to build those apps as](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=62.24) [Docker images and then test and run them as containers, and because of](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=67.35) [the way that containers work,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=72.89) [if your app works on Docker Desktop, it is pretty much](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=74.64) [nailed on to work in production.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=78.48) [But you know what?](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=82.54) [I could talk all day, and we don't want that.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=83.17) [So let's go and get it. Now I'm here a docker.com, but of course](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=85.09) [you can just as easily Google Docker Desktop,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=90.78) [but I go products and Docker desktop. Ah! Now it's detected that I'm on a Mac,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=94.34) [but look, it's also got Windows.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=101.1) [Oh, and look, even a link to Linux. Now, right now,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=102.98) [they do an Edge under Stable channel. Stable is the safe route and probably](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=106.8) [more like what you'll be running in production, whereas Edge,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=110.78) [that's more for the risk takers, and it gets you some of the](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=113.94) [newer and maybe more experimental features.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=116.49) [So for me, I'll go for Edge. Now, while that downloads, okay,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=119.47) [all of this is pretty much identical for Windows.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=125.11) [It's basically fire up the installer and then next,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=128.45) [next, next until you're done.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=131.58) [Well, I'll tell you what.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=133.84) [Here is mine in my Downloads folder.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=134.85) [I just fire that up, and okay, it's going to do a bit of thinking,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=137.74) [and then yeah,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=142.74) [look. It's just drag over here to my Apps folder,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=143.39) [and away that goes. Now of course, depending on your internet connection,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=145.94) [this might take a minute or something like that, but when it's done,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=149.88) [it's then just like any other app in your launchpad on a Mac, or I guess,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=154.2) [in your Start menu on Windows. Oh, yeah,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=158.2) [customary security stuff.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=162.36) [And then on a Mac,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=165.04) [you get a whale at the top here. For Windows, it's a whale in](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=166.4) [the bottom right‑hand corner in your system tray, but once it's](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=170.33) [all settled and it looks like this,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=174.09) [that's Docker running. And seriously, at this point,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=176.74) [you are ready to rock and roll with a full‑on Docker](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=180.38) [environment on your local machine.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=183.46) [But I want to show you some quick stuff, right?](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=186.34) [So clicking on the whale gets you a bunch of options, and now look,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=190.44) [you can restart it.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=194.16) [There's Kubernetes stuff.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=195.57) [Now look, yours might be empty, by the way, your Kubernetes stuff,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=197.23) [but we'll have a look at preferences. Now, okay, the](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=201.04) [General tab lets you say things like,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=205.29) [I want to automatically start when I boot up.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=207.42) [Obviously, I probably want to check for new versions or stuff like that, right?](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=209.95) [Resources is interesting.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=214.14) [It lets you keep a leash on how much of your system Docker consumes.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=215.89) [I'm going to skip Engine and CLI actually,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=220.44) [because we're a Getting Started course, but Kubernetes here,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=222.18) [this lets you run a local Kubernetes cluster as well.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=225.69) [Now, okay, we're getting started with Docker,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=229.23) [and I don't want to get off track or confuse things, but if you are needing to](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=231.9) [test and develop against Kubernetes, boom! Right there, Docker Desktop has you](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=236.74) [covered, as does Pluralsight actually. I don't know,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=242.13) [maybe take a screen grab of this or whatever,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=245.14) [because this is the best way to start your Kubernetes journey.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=247.31) [Well,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=252.34) [a couple of last things before we crack on. Docker Desktop on Windows](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=252.79) [can run Linux containers and Windows containers,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=256.81) [which, when you think about it, is pretty sweet.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=260.81) [I mean,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=263.21) [you can use your Windows laptop to develop and test Linux and Windows apps.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=263.73) [In fact,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=269.08) [you get a nifty little option like this that lets you flip between the two.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=269.94) [Unfortunately, Docker Desktop on Mac, yeah, that only does Linux apps. Anyway,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=274.34) [magic! If you've got Docker Desktop, you're ready to, well,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=280.9) [do you know what?](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=285.24) [Not only follow along with the examples,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=285.81) [but you're ready to do so much more, because like I said,](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=288.22) [it is full‑on Docker, and you know what? It's becoming more and more popular as a local dev and test tool.](https://app.pluralsight.com/course-player?clipId=47fdaf7b-1538-4ad1-8a62-b1da884a11af&startTime=291.4)

### [Play with Docker](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b)

[All right, Play with Docker.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=1.34) [So if you've been following along you'll have seen how to](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=5.06) [install Docker Desktop on your own computer.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=7.71) [And it's the business right, I love it, but what if you](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=12.24) [can't install software on your computer? Or,](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=16.53) [like, maybe you've only got access to a work machine and it](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=18.9) [doesn't let you install software. Or, I don't know,](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=22.17) [maybe your computer's to weird or something.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=24.97) [No sweat, it's all good.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=27.74) [Play with Docker has got you covered.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=29.56) [All you need is a modern browser and a Docker Hub](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=32.35) [account. So, let's get straight to it.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=35.68) [The URL's here, labs.play‑with‑docker.com.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=39.14) [Okay, and as we can see, there's a cheeky little log in, but that's all right.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=43.34) [All you need is a Docker Hub account, and they are free.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=48.63) [And do you know what, honestly,](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=52.15) [if you're serious about learning Docker a Hub account is pretty much mandatory.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=54.45) [So, if you haven't already got one, crack open a new tab and head over to](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=61.34) [hub.docker.com. Then just go through the sign up here.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=66.74) [You know what, it is literally those three or whatever fields and you'll](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=71.54) [be in business. Anyway, once you've got that it's back here to Play with](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=75.37) [Docker and just whack in your credentials. Now then, and I love this,](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=80.4) [right, so don't get me wrong, but Play with Docker is provided to you](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=85.77) [courtesy of Docker, Inc. for free.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=91.6) [So, if sometimes it's not the fastest or most](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=95.69) [responsive in the world, I don't know, cut them some slack.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=99.1) [It's not like you're paying for it. Anyway, look at the clock up here. It is](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=102.88) [a 4‑hour countdown. And I'm telling you, and trust me on this, when that](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=108.96) [clock hits 0 it is goodbye to anything you built.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=114.46) [So, you are getting here a time limited 4‑hour playground.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=118.65) [But it is as easy as clicking ADD NEW INSTANCE here.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=124.24) [Honestly. And that's it.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=128.51) [That right there is a fully‑working Docker instance.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=130.27) [So, if you can't install Docker Desktop and you don't have](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=135.14) [access to a lab or anything come on over to Play with Docker](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=138.21) [and you can still follow along.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=141.98) [And you know what, for us on this Getting Started course I reckon we are ready to peel back the curtain and see the magic.](https://app.pluralsight.com/course-player?clipId=6fde219a-25d7-457a-82b2-10ccdd0fc91b&startTime=144.74)

## [Deploying a Containerized App](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4)

### [Module Overview](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4)

[Okay, so no messing about.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=1.44) [We are about to take an application all the way from](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=3.43) [source code to running in a container, plus all the funky stuff in between.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=7.1) [Now the idea is you're going to get a proper hands‑on experience that,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=12.34) [I don't know, lights up the old neurons and creates one of those ah‑ha moments.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=17.84) [You know the type where you're like, okay, yeah, now I get it.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=22.43) [Now I know what all the fuss is about and why I need Docker so much.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=27.04) [But you know what, as well as that,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=32.14) [I'm kind of hoping that the whole process we'll go through will](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=34.11) [give you this sort of end‑to‑end holistic view of what the](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=36.89) [major pieces and moving parts are, and yeah,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=40.72) [both from a developer and an operations perspective.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=44.25) [Now, a couple of things.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=49.34) [Like I said,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=51.34) [you're totally welcome to follow along on your laptop](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=52.25) [or wherever and get your hands on, but you don't have to.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=54.49) [I am more than happy if you're just to watch, you're still going to learn a ton.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=58.14) [The other thing I wanted to mention is that all of what we're about to do is](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=62.44) [100% relevant for developers and operations professionals.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=67.17) [So,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=73.64) [on the developer front you'll see how to package your app as a container image,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=74.31) [share it in a registry, and then how to run it as a container.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=79.42) [And you know what,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=83.04) [you'll be able to do all of this on your laptop with crazy cool tools.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=84.44) [Over on the operations front, well, you'll get familiar with Docker in general,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=90.04) [like I mean what the heck are things like images and containers,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=94.55) [but you'll also see how to run a container,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=98.41) [start it, stop it, all of that jazz, right?](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=101.36) [And I reckon if you're familiar with virtual machines](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=104.35) [you'll see a bunch of parallels, yeah?](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=107.43) [But you'll also see a bunch of differences.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=110.14) [Oh, and of course, if you're DevOps or if you're looking to get into DevOps,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=113.74) [haha, throw me a high five because you are going to get a piece of everything.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=118.35) [Well, either way, okay.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=125.44) [In my opinion, vast experience, yeah,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=127.94) [the best developers and the best sys admins or operations people](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=131.61) [all have some understanding of the full picture.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=135.19) [So, if you're,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=138.64) [let's say a sys admin, it is absolutely a good thing for you to know](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=140.31) [the fundamentals of what developers are up to.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=144.43) [And then on the flip side,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=147.74) [if you're a developer it's going to make your life a whole ton easier](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=149.07) [knowing some of the things that operations care about.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=153.11) [But you know what, look, I'm waffling.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=156.27) [Just trust me when I say the simplicity and slickness,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=158.24) [if that's even a word, of what we're about to do,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=163.58) [I am telling you it's going to blow your mind.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=167.38) [Well, look, waffle, waffle, waffle.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=171.24) [Here's the plan, we're going to race through a full workflow and we'll do at,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=173.19) [I don't know, something like warp 6 or 7.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=178.11) [A bit of a reconnaissance run actually.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=180.47) [The idea being to give you a big picture so that when we drill](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=182.52) [into it a little bit later you've got an idea of how everything](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=185.77) [fits into that bigger picture.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=189.08) [Well,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=191.34) [do you know what, once we're done with that we'll then](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=191.74) [step through things a bit slower.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=193.95) [I don't know, impulse speed, yeah?](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=196.12) [Now the idea with this bit is to reinforce](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=198.94) [everything that you'll just have seen,](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=201.59) [plus it'll give you more of a chance to digest things.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=203.6) [And that's the plan.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=207.54) [And like I said before, look, follow along if you want.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=209.33) [Everything we're about to do can be done in Docker Desktop or Play with Docker.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=212.32) [Whew, sound like fun?](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=217.54) [Well I'm telling you it is going to be, right? Let's get this show on the road.](https://app.pluralsight.com/course-player?clipId=1576d481-798f-4c16-9dbb-44428f179cf4&startTime=219.32)

### [Warp Speed Run-through](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257)

[Okay, time for that reconnaissance flight. And remember,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=1.44) [the aim here is just to grasp the end‑to‑end flow, so](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=5.01) [it is absolutely fine, in fact,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=9.26) [I expect that some of you are going to get lost at](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=11.87) [some point, but it's totally okay,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=14.58) [because this is like a movie trailer, or whatever,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=17.23) [where you're just getting the highlights.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=19.95) [Remember,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=21.99) [we're going to be playing the full‑length movie right after.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=22.65) [Now then, this here is the workflow we're about to do. We'll](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=26.59) [take some application source code,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=30.89) [and then we'll use Docker to package it as a container image, push](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=32.77) [that image to a registry, and run it as a container.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=37.25) [And you know what, actually, for this part,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=41.64) [even though it's demos, you should just watch.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=43.85) [You can follow along in your own lab when we step through](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=46.33) [things a little bit slower later on. Anyway,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=48.81) [look, as we can see,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=51.94) [I have got Docker running. Now, this is actually Docker Desktop on my Mac,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=53.32) [but it doesn't have to be.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=60.64) [Docker is Docker, so it could be Docker Desktop on Windows.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=61.87) [It could be Play with Docker in the cloud, pretty much](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=65.65) [any Docker installation, to be honest,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=67.97) [But then this here is some source code, and I don't want you](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=70.94) [to worry about what that is right now.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=75.2) [It is just source code for an application,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=77.1) [though, actually,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=81.44) [I will say, we've got a special file here called Dockerfile that](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=82.94) [tells Docker some important stuff about the app. Anyway, look,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=87.02) [detail to come. With all of that in place, we can build that code](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=90.32) [into a container image.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=93.75) [So, the command to do that is docker image build, and](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=95.94) [we'll talk about the options later.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=99.65) [But away that goes, basically pulling the app code and building any](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=101.55) [dependencies and packaging it all as a neat and tidy image.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=105.87) [Then when that's done, we end up with this image here and no problems, actually,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=112.14) [if you're unsure what an image is yet, we'll circle back later.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=118.34) [But once we've got the image,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=121.84) [the next step is to push it to a registry, which we do with this](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=123.56) [command here. Give that a second to upload.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=126.93) [Okay, that is now on dockerhub here. Yeah, look, there we go.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=133.14) [So, it's on dockerhub ready to be pulled and used.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=139.74) [So remember, that's the app and all dependencies packaged up as](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=143.25) [an image and stored in a centralized repository. And then to run](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=148.42) [it, we just go docker container run here with a few parameters,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=152.28) [and that should be running, which it is.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=158.54) [And because I know that it's a web app on Port 8080, and I guess](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=163.54) [because I know a thing or two about Docker Desktop, I know I can](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=167.86) [reach that on local host 8080.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=171.44) [And there it is, up and running as a containerized app.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=174.64) [How about that, eh?](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=180.2) [We started out with some code and a list of dependencies, and then we've](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=183.24) [used Docker to package everything up as this cool image.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=188.27) [We used Docker again to push that to a centralized registry, and](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=191.6) [we used Docker again to run it as a container.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=195.54) [And I don't know about you,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=199.24) [but I still remember for me, like the first time that I did](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=201.46) [that, I was blown away, like thumping my chest and feeling](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=204.6) [properly large and in charge.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=208.42) [But, I get the flip side as well, right?](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=211.84) [It can kind of be a bit underwhelming.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=214.39) [I mean, I don't know, it was almost too easy.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=216.7) [Well, if you think that's the case,](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=220.94) [get used to it because that is the beauty of this.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=222.62) [Simple is the new normal with Docker.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=226.06) [Anyway, look, that's the reconnaissance flight. Time to look a bit closer and give you a chance for some hands‑on.](https://app.pluralsight.com/course-player?clipId=14a6ea69-3f26-4a4b-ac07-f34500624257&startTime=229.04)

### [Containerizing an App](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d)

[Okay,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=1.34) [so we're going to step through exactly the same workflow that we've just seen,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=2.01) [only this time, a little slower.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=5.77) [Give you a chance, maybe, to follow along and figure things out a bit better.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=8.02) [Now, I'm going to be doing the demos in Docker Desktop on my Mac.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=12.44) [But do you know what? Docker is Docker, and that's part of the beauty.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=17.54) [So if you're following along,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=21.09) [maybe in Play with Docker, or even Docker Desktop on](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=22.91) [Windows, or Docker somewhere else, it's all going to be good.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=25.6) [Well, first things first.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=29.84) [The app we're building is a Linux app.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=31.87) [So, if you're on Docker Desktop on Windows,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=34.86) [be sure you've got it rigged for Linux containers.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=37.84) [If you're on Mac or Linux, you're set and good to do.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=41.01) [Anyway, this here is the app, and it is publicly available on GitHub at this URL.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=44.74) [Now, again, Docker is language agnostic.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=51.24) [So we're not bothered about the detail here.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=55.89) [I mean, yeah, I'll quickly walk through it,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=57.99) [but it literally could be any app; Docker doesn't care.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=60.14) [So, pick your favorite language and packages; they're all good with Docker.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=63.55) [Anyway, we'll look at the main app here.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=68.34) [Yeah,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=73.14) [super short, right? It is an Express app using the handlebars view engine, and,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=73.42) [well,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=80.23) [you know what? Not massively bothered about the rest,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=80.94) [other than maybe this bit here.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=83.66) [The app itself listens on port 8080.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=85.64) [So, that means when we run it in a container,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=89.84) [it is going to bind to port 8080 inside the container.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=94.08) [So, park that for later, right?](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=98.1) [Port 8080.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=100.33) [0h, and it'll print this message, but that's basically the app.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=102.18) [Then back here,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=106.74) [this file will list the dependency, so the packages the app needs, and](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=108.23) [under here is where the view lives. Anyway, look,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=113.04) [a super simple web app that, if you're a front‑end web developer,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=117.42) [you can no doubt see, well, look, it's about as bog‑standard as they come,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=121.77) [isn't it, so the point being not written in any special way or](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=125.85) [special language to make it work with containers,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=129.64) [and that's the whole point.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=131.79) [Take pretty much any regular app, ha, it'll work in a](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=132.88) [container! Now, the process is what we saw before.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=136.22) [Take the source code and build it into an image.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=141.09) [Now, Docker is clever enough to do that, or it's almost clever enough.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=143.73) [It actually needs a tiny bit of help,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=148.15) [which is where this file here called Dockerfile comes into play.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=150.65) [And I mean, look at it.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=154.14) [It's basically a set of build instructions.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=155.27) [So, a set of steps for Docker to follow to build the app and](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=158.16) [its dependencies into a container image.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=162.19) [So all the container image is is app code and dependencies,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=165.14) [all neatly packaged so that we can share it and run it.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=169.32) [Anyway, look,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=174.04) [this is a Linux‑based Node.js app, so the file here says start building this](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=175.17) [image by first grabbing the node:current‑alpine image.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=180.5) [Now, hmm, okay,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=185.01) [this is actually a special container image with node tools preinstalled,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=186.68) [and we're going to use it as the foundation, or the bottom layer,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=191.94) [of our image to build everything else on top of.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=195.43) [Now, a quick side note, right.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=198.04) [Okay, this is not a full‑blown Linux distro with a kernel and everything, right?](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=200.84) [It's more like maybe a set of file system constructs, like](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=205.58) [folders and device files and stuff. Because what happens,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=209.4) [right, is every container, when it is running,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=212.17) [uses the kernel of the host it's running on, so the container](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=215.88) [itself doesn't come packaged with its own kernel.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=219.85) [Anyway,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=222.44) [on top of a kernel, an operating system has config files](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=222.81) [and device files and other stuff, so this image here is a](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=226.26) [set of Alpine Linux constructs, plus, of course,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=229.85) [a bunch of node stuff.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=233.31) [Now, this is a getting started course,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=235.24) [right? If you need more details on how containers share a host's](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=237.99) [kernel and all kinds of internal stuff like that,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=241.92) [then Docker Deep Dive here is what you want.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=245.45) [It covers all of that in glorious detail.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=248.3) [Anyway,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=253.24) [next up is just a bunch of metadata telling you who to hustle about the app.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=254.34) [Ignore that.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=258.23) [But then this line here is saying in this image make a](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=259.36) [new directory called usr/src/app.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=262.73) [Then the next line is let's copy in our app code, and into](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=267.54) [that folder we just created, it literally is a set of](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=271.25) [instructions Docker just iterates through.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=274.37) [Now, however,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=277.04) [the period here says copy in all the files and subdirectories](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=278.4) [from wherever we run the build command.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=283.34) [So on my machine here,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=286.84) [I'm going to be running the build command in a minute from](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=288.02) [within the folder that's got all of the app code.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=290.66) [We'll see it in a second.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=292.73) [Next up, though, we set the working directory to where we just installed the app.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=294.54) [This line installs the app dependencies listed in package.json,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=299.34) [and then this entrypoint here starts the app,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=303.32) [or it's the command to run each time a container](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=307.23) [will get started from this image.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=311.01) [It's basically calling node with the name of the main app file. And that's it.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=313) [That is how Docker is going to build the image.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=318.19) [Start with the Linux image with node tools, add some metadata,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=320.72) [create a directory for the app, copy in the app code,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=324.63) [set the working directory, install dependencies, and set this as the](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=327.59) [command to start the app. Flipping magic! Now look,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=331.57) [we're a getting started course, I don't know how many times I've](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=338.82) [said that ,so we're only wetting the appetite and painting the](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=341.3) [picture of what this is all about. We've plenty more courses to](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=344.45) [take you to the next level.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=347.45) [But you know what?](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=348.77) [Stop waffling, Nigel.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=350.04) [Let's build it! Now at this point, if you're wanting to follow along,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=351.12) [you're going to need two things, Git and Docker.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=355.54) [If you're on your laptop or whatever with Docker Desktop,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=358.94) [then just Google how to install Git. It is properly easy. If](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=361.58) [you're following along on Play with Docker,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=365.41) [ha, even better! Git's already installed.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=367.82) [Anyway, this here is the repo, and I want to copy this.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=370.47) [It's just the URL to the repo.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=376.04) [Then from a Command Prompt, I go git clone, and I'll paste that URI in.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=378.23) [Now look, if you're new to this,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=384.34) [all that's done is it's made a copy of that repo with all of](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=385.98) [the source code onto my local computer.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=389.98) [Now, actually,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=393.14) [I want to switch into that directory, and here are all of the](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=393.62) [files. Exactly what we saw on GitHub, yeah? Okay,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=401.22) [so the command to build an image is docker image build, or](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=405.04) [you can just go docker build for short.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=409.45) [I am going to tag this as nigelpoulton and gsd for getting started with Docker.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=411.94) [Then I'll finally say first container.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=418.34) [Reckon that will do.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=421.79) [Yeah.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=423.24) [Now then, look,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=423.94) [this bit here is my Docker Hub ID. So yours will be](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=425.24) [different. Now, you can use mine, and if you do,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=429.26) [some of this stuff we're about to do will still work.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=433.26) [But trust me, it's way better if you use your own.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=436.44) [So again, if you haven't already got your own Docker Hub ID,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=440.44) [maybe pause the video and head over to Docker Hub and get one.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=444.59) [They're free, and they're pretty important if you're serious](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=447.86) [about working with Docker. Anyway, look,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=450.58) [this bit is your Hub ID, then this bit is the name of the](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=454.22) [repository, and then this is the actual name of the image.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=458.37) [Normally this last bit will be some sort of version string, but honestly,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=462.92) [it can be anything, and this will work for us.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=466.91) [Well, then we say period. Now, the period is important.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=470.24) [It's telling Docker that when we fire off this command,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=474.37) [all the files it needs, especially the Dockerfile with the build instructions,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=477.56) [are in the directory that I'm running the command from. And](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=481.78) [away that goes! And if we look closely, well,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=486.01) [actually,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=489.55) [I'm going to warp space time a bit here so that you see](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=490.18) [things happening as I explain them.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=492.9) [Well, Docker is iterating through those instructions in the Dockerfile,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=494.94) [the exact same instructions, yeah,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=498.96) [So it is pulling the node alpine image, creating that directory](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=501.24) [for the app code, setting the working directory,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=505.52) [installing all the dependencies, and then dumping out the image.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=508.5) [Now, we don't see the entrypoint.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=512.19) [command, as that just gets stored as metadata.](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=514.05) [But this, right here, is the image! So the app, and all dependencies,](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=516.84) [all wrapped up nicely, and here it is on my machine. How easy was that?](https://app.pluralsight.com/course-player?clipId=79d02b2c-c312-4308-b763-def8ffddd89d&startTime=523.15)

### [Hosting on a Registry](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9)

[Alright, we've taken some app code and built it into a container image,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=1.44) [but right now that image is landlocked on your local computer.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=5.17) [And you know what,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=10.04) [that's alright if all you want to do is run a container from it on that machine,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=10.86) [but in the real world,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=14.61) [you're going to want to host it somewhere where you can easily](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=15.85) [access it and use it from different environments,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=18.86) [which, is where centralized repositories like Docker Hub come into play.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=21.91) [Now, I've got to say, there are loads of container registries out there.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=27.94) [I mean, for sure Docker Hub is the most popular,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=32.42) [but Google's got one, GitHub got one, there genuinely are loads,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=35.04) [and you can even host your own on your own private cloud or even on‑premises.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=39.44) [The point being,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=45.14) [container registries are where we store container images so we can](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=46.53) [share them and access them from different environments.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=51.15) [Anyway, when we built the image, we tagged it with this,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=55.14) [and I think I said something like,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=58.94) [it's best if you use your own Docker Hub ID instead of mine.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=60.86) [Well, if you followed my advice and you did use your own,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=64.74) [you'll be able to use docker image push to upload it to Docker Hub.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=67.95) [So I'm going to go docker image push,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=73.04) [and then it's just the name or the tag of the image.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=76.54) [Now, if you try this with my Hub ID,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=81.34) [it's going to fail because you don't have permission](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=85.29) [to push it up to my repositories.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=87.44) [Actually, do you know what, even if you're pushing to your own repositories,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=89.27) [you might need to do a docker login.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=93.34) [Anyway, look, that's pushed, meaning if we look at Docker Hub, and again,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=95.57) [this is my account so it'll be different for you, but it's this gsd](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=103.79) [one here. And this should be our image, first‑ctr. And see how it's](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=108.59) [recognized it as a Linux app? Pretty cool.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=116.94) [Anyway, look, that easy again.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=119.66) [At this point,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=121.94) [we've taken some regular app code, packaged the app and all of](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=122.94) [its dependencies as a tidy little image,](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=126.88) [and now we've lobbed that up to a centralized repository, just too easy. Well, do you know what, let's go and run it.](https://app.pluralsight.com/course-player?clipId=74dcc3a2-c223-4376-99ca-3dc47b9527e9&startTime=129.39)

### [Running a Containerized App](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f)

[Now then,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=1.44) [if you've been following along you'll have an image on your local](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=2.2) [machine with the app and the dependencies inside of it.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=5.21) [And you can totally use that local image and run a container from it,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=7.95) [but I want to demonstrate Docker Hub so I'm going to](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=11.9) [delete that local copy. Though,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=14.32) [before I do that, it's a good thought exercise to think of an image](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=17.43) [as being like a stopped container. And then, on the flip side, a](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=21.43) [container is basically a running image.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=24.65) [So, if you know virtual machines at all,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=27.64) [and I'm figuring most of you will, well,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=29.9) [a VM template is basically a stopped VM.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=33.09) [And then on the flip side, a VM is a running instance of a VM template. Kind](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=36.76) [of sort of, yeah? And if you're a developer the same kind of goes for](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=41.6) [classes in object‑oriented programming languages.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=45.19) [So, an image would be like a class and then a running container](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=48.26) [would be like an object created from that class.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=52.51) [Huh. Long story short, images are build‑time constructs](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=55.84) [and containers are runtime constructs.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=59.18) [Anyway, I am going to delete that local copy of the image.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=62.44) [Give it a quick double‑check. All right,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=68.14) [we're all gone. Now, to run a container from it is docker container run. The](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=70.95) [‑d flag here says to run this container in the background detached from my](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=78.56) [terminal. And this will make more sense in a minute.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=82.98) [Then we give it a name.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=86.34) [I'll call it web.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=87.83) [You can call yours whatever you want. And then we'll do some port mapping.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=89.24) [So, hang on a sec.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=94.64) [This is basically saying map port 8000 on the Docker host,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=96.84) [which for me is my laptop because I'm running on Docker Desktop.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=102.31) [If you're in Play with Docker that'll be port 8000 in](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=105.51) [your Play‑with‑Docker instance.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=108.96) [But then this other part here, 8080, is the port that the](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=111.44) [app is listening on in the container.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=115.37) [So if we come and look at the code again real quick,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=118.3) [I think I said to remember this earlier on, but look,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=120.68) [the application itself is working on port 8080.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=124.04) [Well,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=128.44) [back here the port mapping is saying any traffic hitting your](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=128.88) [Docker host on 8000 is going to get sent to 8080 in the](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=132.62) [container and to the app, of course.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=136.41) [Well, we've also got to tell it which image to use. Now, Docker is opinionated.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=139.54) [That means in this instance if we don't stick a URL of a](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=146.57) [different registry in front of the image Docker is going to](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=151.16) [think we mean Docker Hub. Well, away that goes. So, the top line here says,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=154.44) [well first off it looked for a local copy of the image. But I've deleted that,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=161.77) [remember, so it didn't find one. So, it went to Docker Hub,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=165.3) [pulled it,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=169.45) [and it started a container from it. And this hideous long string here is the](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=170.09) [ID of that running container. Only, is it actually running?](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=174.39) [Looks like it is to me, this here being a short version of that](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=179.54) [container ID. And as well we can see the image it's based on. This](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=183.76) [is the app command that we documented, remember?](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=189.41) [And then whatever the port mappings are in a name.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=192.39) [So, Docker says it's running, but you know what we can do even better than that.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=195.34) [It's a web server mapped to port 8000 on your Docker host,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=199.73) [which, if you're following along on Docker Desktop,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=204.24) [is your local machine or your local host adaptor.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=206.93) [If you're on Play with Docker you'll have a nice button with the](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=209.89) [port number on it that you can just click.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=212.86) [And then I guess if you're on another service in the cloud,](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=216.34) [probably, all you'll need is the public IP or DNS of the cloud](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=219.55) [instance you're running on and then port 8000.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=223.87) [And look, there we are, a running web server.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=226.74) [Whoo. So, we have gone from bog‑standard, uninteresting source](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=231.34) [code on GitHub and then used Docker to build an image, pushed to](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=236.46) [a registry, and then pulled from a registry and run as a](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=240.21) [container. Walk in the park. Well, let's see if we can go and stop and restart it.](https://app.pluralsight.com/course-player?clipId=af96bd87-dfb5-4998-9ab4-40da7441901f&startTime=243.5)

### [Managing a Containerized App](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb)

[So, we've got a web app running inside a container.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=1.44) [We're not messing about, are we? Anyway, you know how](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=4.69) [the industry loves a good buzz word?](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=7.6) [Well, we call what we have got or what we've done a containerized app,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=10.18) [and it's kind of like a super fast,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=17.24) [lightweight virtual machine, meaning, we can stop and](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=19.93) [restart it, just like we can with a VM.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=23.41) [So, funnily enough, docker container stop is the command to](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=26.15) [stop a container, and you can give it the name of the](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=30.5) [container or its id. I called mine web, so we'll go with that. Now, ah ha,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=33.52) [yeah,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=38.74) [it can take a few seconds while Docker gives the app running inside](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=39.12) [the container a chance to gracefully shut down.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=42.76) [Basically,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=46.14) [what it's done is it sent the app a SIGTERM signal, and then I think it's](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=46.6) [allowing something like 10 seconds of grace for the app to shut itself down,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=51.59) [and if it doesn't shut itself down gracefully,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=55.43) [it'll be terminated with a SIGKILL. Anyway,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=57.79) [if we list containers again, but with the ‑a flag, we can see it's still listed,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=62.27) [but it is showing as Exited,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=69.3) [meaning, if we hit refresh in our browser here, okay, not responding.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=71.12) [Well, yeah, we just stopped it.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=77.53) [Then, if we start it up again with docker container start this time, same name,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=80.54) [of course, another quick refresh, and we're already back in business.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=86.04) [So starting and stopping containers couldn't be easier.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=90.78) [Well, guess what?](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=96.74) [Deleting one's pretty easy as well. So, I'll stop it first.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=98.14) [Remember,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=103.74) [give that a second, yeah, and then I'll delete it with docker](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=104.23) [container rm, and then the name of the container.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=109.54) [Then, if we run that ls ‑a command again, not a trace, right?](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=113.34) [Meaning, obviously if we retry the start command from a second ago, nah, no joy.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=118.89) [The container is literally wiped from off the face off the earth.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=125.49) [Now real quick, when we run that container,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=131.54) [we use the ‑d flag to run it detached from the terminal, and that's fine for](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=134.63) [containers that are designed to run in the background,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=140.77) [like normal web servers and the likes.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=143.27) [But, you can run containers in the foreground attached to your terminal.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=144.95) [So, a really simple example might be docker container run again,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=150.53) [only this time ‑it for interactive and terminal.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=156.14) [Call it whatever you want again, and we'll base this one on the base alpine](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=160.35) [image and run sh as the main app to run inside the container.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=166.59) [Now,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=172.64) [another example might be this: if you're running Docker on](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=172.85) [Windows Server or even Docker Desktop on Windows,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=175.83) [if you are in Windows container mode. Anyway,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=179.34) [look, if you look closely, you'll see how my shell prompt changed.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=182.41) [That's because my shell is now attached directly inside that running container,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=187.34) [meaning, any time I run a command here, it's actually](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=192.21) [running inside the container, I mean, that's pretty cool,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=196.13) [right?](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=199.09) [We are inside of a container running commands from there.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=199.33) [However, if I type exit, that will drop me back to my terminal on my Mac.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=203.94) [But it'll also kill the container because I'm effectively killing](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=210.04) [the shell process that I said was going to be the container's main](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=214.79) [process, and when you kill the main process in a container, PID 1,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=218.43) [if you know your Linux, then the container basically throws its arms up and says,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=223.87) [I've got no more work to do.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=228.38) [I might as well terminate. Well, I don't want that actually,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=230.18) [so, instead I will type ctrl+p+q, and don't ask me why it's p](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=234.12) [and q, but we can see that has dropped me back to my local](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=240.64) [terminal, and if we list the containers,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=244.47) [yeah, look, it is still running,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=248.34) [so, ctrl+p+q is a graceful way to leave a container without burning](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=250.23) [it to the ground as you leave, and then, this time to terminate it,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=255.92) [I'm going to do it with the ‑f flag.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=261.52) [This basically says to Docker, look,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=264.32) [I know that the container's running and you don't](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=266.59) [normally like to delete running containers,](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=269) [but trust me, just annihilate this one.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=272.04) [Magic. Tell you what, though, it's been a lot, so let's do a quick recap.](https://app.pluralsight.com/course-player?clipId=11dcd9d1-2ca0-4147-8ff7-49f28b65aefb&startTime=275.04)

### [Recap](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d)

[So, we know the crack by now.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=1.44) [We started out with regular app code, and that's](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=3.05) [important because Docker doesn't care.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=6.5) [It is language agnostic.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=9.19) [So you can start using Docker right now without](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=11.74) [having to learn any new languages.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=14.5) [Now, you might have to learn some new tools,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=17.24) [but Dan's going to have you covered with some of those in the next](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=19.47) [course on the Docker for Developers learning path.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=22.48) [Anyway, look, we took that code and we used Docker to build it into an image,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=26.04) [push it to a registry, and run it as a container.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=32.08) [We even stopped it, restarted it, and deleted it.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=34.64) [Marvelous! But why, Nigel, pray tell, should I care?](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=37.76) [Well, and I know a bunch of you get this already,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=44.54) [I get it, right, but not everybody might get it.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=48.42) [Well,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=51.34) [look, on the operations front, containers are the future](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=51.86) [and they're kind of virtualization 2.0.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=55.66) [So, we know that hypervisors virtualize hardware, like virtual CPUs,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=59.34) [virtual RAM, virtual networks, all of that jazz, yeah. Well,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=63.27) [containers do a similar thing, only a bit higher up in the stack.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=67.07) [They virtualize operating systems. So each container is](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=70.98) [basically a virtual operating system, so it has its own](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=76.45) [process tree, its own root file system, its own eth0, and all the rest.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=80.43) [So, kind of like how every VM on a host shares the same hardware,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=86.94) [every container on a host shares the same OS kernel.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=92.59) [And because there's only a single OS kernel in the](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=98.34) [container model, containers are smaller, faster, and more](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=101.8) [lightweight than virtual machines,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=105.79) [meaning more applications per square foot of infrastructure.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=107.53) [Again,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=111.69) [that's because containers are just app code and dependencies. Like, if you run,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=112.64) [I don't know,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=118.84) [50 containers on a host, let's say, they all share a single OS kernel,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=119.38) [hence, smaller, faster, and ultimately, more applications per host.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=125.47) [Plus,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=132.04) [there's a whole bunch of new tools to manage containers and all of that new,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=132.78) [shiny, underlying infrastructure.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=137.05) [Plus as well,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=138.97) [there's a bunch of new paradigms when it comes to security and](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=140.06) [shared kernels and stuff, so you really want to know this. So,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=143.31) [that's a good part of why you need to care as an operations or an](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=148.91) [infrastructure professional.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=152.74) [Now, on the developer front,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=155.04) [you care because you can develop apps on your laptop](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=157.36) [with your favorite languages and tools,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=161.02) [and Dan's going to go into more detail about that in the](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=162.84) [next course on the developer path.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=165.1) [But you develop locally in the security that if it works on your laptop,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=167.74) [it is going to work in production, all because of the way](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=173.72) [Docker builds your apps into an image.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=178.8) [Remember, it packages the app, of course,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=181.78) [plus all dependencies, meaning, sorry if I'm overstressing this, right,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=185.17) [I feel like a bit of a geek sometimes, but the thing is,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=190.49) [because all of the dependencies are packaged with the app, gone are the days](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=193.58) [of where something works on your laptop, but it bombs out in production](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=198.08) [because maybe you're running different libraries or whatever. They're not in](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=201.43) [the container model because the libraries get shipped with the app. As well,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=205.28) [though, if you're a developer, the tools,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=210.46) [the portability of code, unloads more things and making containers more and](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=212.76) [more the pattern of choice for developing modern apps.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=218.1) [Oh, you know what, though?](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=223.04) [I reckon that'll do for a recap. Just let me finish by saying one](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=224.6) [last time it was gloriously easy to get that app from source code](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=229.12) [to running in a container, and who in their right mind doesn't](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=234.11) [want more of that? Anyway, we're not done yet.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=239.03) [So far, yeah, we've seen how to containerize a ridiculously simple app using](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=242.84) [the Docker CLI and run it on a standalone Docker host.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=248.11) [Well, coming up next,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=252.44) [we'll look at how to easily build a more resilient](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=254.32) [infrastructure to run your apps on,](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=258.16) [and we'll see how to define and document more complex apps](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=260.74) [in declarative YAML files that just make it so much easier](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=265.19) [to deploy and manage them.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=268.66) [Oh, and of course, you'll see it in action and get your chance to get hands on. See you there.](https://app.pluralsight.com/course-player?clipId=332db364-8882-4389-896a-bd16520e942d&startTime=270.45)

## [Microservices and the Real World](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f)

### [Module Overview](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f)

[Okay, your time and attention are valuable,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=1.54) [and I am massively grateful for them, so let's not waste them.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=4.36) [This is what we're about to cover. We'll kick off,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=8.07) [actually, by busting some jargon,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=12.01) [so we'll be saying what we mean when we use terms like](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=14.55) [cloud‑native and microservices. Now, this is important because,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=18.19) [well,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=24.14) [they're real things, and they impact both](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=24.74) [developers and operations professionals,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=26.64) [but, as well,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=29.84) [I don't want to make assumptions that everybody](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=31.32) [automatically knows what they mean.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=33.66) [Well, look, when we're done with that,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=36.24) [we'll get our hands on with a crazy cool developer tool called Docker Compose.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=38.28) [Now, you're going to want to watch this even if you're in Ops,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=44.74) [because we'll be showing multi‑container apps and we'll be introducing](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=48.62) [things like microservices and declarative configuration.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=54.05) [Now, of course, those might be buzzwords right now,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=58.94) [believe me, I know, but as we crack on,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=62.48) [I promise we'll explain them all. Anyway, look,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=66.23) [then we'll take a look at something called Docker Swarm.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=70.15) [Now, this is a simple, but a powerful alternative to Kubernetes,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=73.94) [and we'll see what it brings to the operations and](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=78.44) [implementation side of things with clustering,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=81.22) [high availability, and security.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=83.72) [Well,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=87.04) [once we've got a swarm built, we'll look at what a](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=87.31) [Docker service is, and at this point,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=89.97) [it'll be important that you understand microservices](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=92.68) [architectures, so don't skip this lesson up here. After that,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=95.77) [we'll wrap things up by looking at Stacks,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=101.65) [which are multi‑container apps like Compose that we've already](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=104.86) [covered, but they've got a more production‑like implementation or a](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=108.07) [more production‑like feel to them. And then,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=112.5) [when we're done with that, seriously,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=116.44) [you'll know exactly what Docker offers on both the](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=118.93) [operations and developer front,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=121.51) [and, obviously, you'll be properly primed and ready](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=123.46) [to explore things even further.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=126.94) [Now, I get it that this might look a lot, and I also get it that I'm throwing](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=130.34) [around buzzwords like I think maybe it makes me sound clever or cool, and I can](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=135.65) [assure you I do not think that. But, what you'll learn here will set you up,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=140.7) [well, nicely as a developer for attacking things like multi‑container](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=147.11) [microservices apps done declaratively. Heck,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=151.43) [I'm going to have to wash my mouth out, so many buzzwords,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=154.9) [but remember, we're going to explain them all.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=157.62) [Also, though, on the operations front,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=160.34) [you'll get a solid grasp of the new way of developing, as](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=163.86) [well as managing, all of these fancy cloud‑native, whatever](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=167.66) [you want to call them, modern apps.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=171.32) [And, of course,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=172.86) [you'll walk away with a decent idea of how to start](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=174.27) [doing it all on a highly available, secure by default,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=177.17) [clustering platform. And buzzwords aside, between you and me, honestly,](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=180.64) [what we're about to see is properly game changing. But you know what, enough of me waffling, come on.](https://app.pluralsight.com/course-player?clipId=e83332ea-4280-4ee2-be01-8ec8c0a7498f&startTime=187.54)

### [Cloud-native Microservices](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b)

[Okay, so I want to keep this as brief as possible,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=1.54) [but I also want to make sure you get the picture.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=4.66) [Now, okay, before I go any further,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=8.27) [the definitions you're about to hear are according to Nigel.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=11.13) [Now, in no way am I trying to say they're canonical,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=16.64) [and I totally get that people can be passionate about](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=20.42) [their own definitions, so let me be clear,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=23.85) [in no way am I trying to say that my definition is better than yours,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=26.36) [though, obviously it is.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=31.32) [No, I'm just kidding.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=33.1) [The point is, the definitions here are broadly correct,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=34.11) [but they are tailored a bit towards the content that](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=37.67) [we're covering in this course.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=40.76) [Anyway, look, we'll define microservices first,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=42.72) [and whenever I do this,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=47.03) [I usually find it best to start out with a legacy non‑microservices app.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=48.6) [So this is a picture of an app, and the point is,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=54.34) [while it's a single application in binary,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=57.34) [it's actually made up of lots of small features.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=60.4) [Now, of course, I'm massively oversimplifying,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=63.34) [but the point is the web frontend, the data store,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=66.32) [reporting, logging, the whole picnic is part of a single app,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=71.06) [so it is deployed and managed as a large single unit,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=76.04) [meaning, if you want to maybe patch or push a feature update or something to,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=80.44) [say, the reporting service, well, I'm sorry to break it to you,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=86.35) [you are patching the entire app,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=89.84) [and that can sometimes mean taking the whole thing](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=92.09) [down while the patch is applied.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=95.43) [Yeah, the whole thing, and, of course,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=97.13) [on a weekend where you'd rather be at home or fishing or golfing](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=100.91) [or pretty much anywhere other than the office.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=105.64) [As well, though, in this kind of design,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=110.14) [if you need to scale one aspect, maybe the reporting,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=112.82) [well, you can't.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=116.11) [You basically scale the whole thing or none of it.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=117.92) [I'm sure, you know, like move it to a more powerful cluster or something,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=121.64) [lock, stock, the whole thing.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=125.65) [Now, again, I'm over simplifying of course, but big and clunky was the mantra.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=127.44) [Well, microservices takes that same application experience,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=133.74) [and it breaks each feature out into its own smaller,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=138.98) [discrete service, hence the term, microservices.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=142.48) [Now, in this model,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=147.74) [each microservice usually is coded independently and often by different teams,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=149.02) [and that's the microservices design pattern.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=154.02) [Take the different features of an app and break them](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=157.44) [all out and code them independently.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=160.35) [This then leads to cloud‑native features,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=163.84) [so things like patching, dynamic updating,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=166.92) [dynamic scaling, all of that jazz, but against each](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=171.17) [individual microservice independent of the rest.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=175.38) [So, do whatever you need to do to one part of the app](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=179.24) [without touching and potentially breaking something else or](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=183.69) [everything else, right? Now, again, I'm oversimplifying, but that's the gist.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=187.31) [Now, one last thing,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=193.34) [the term cloud‑native absolutely does not mean that it](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=195.29) [will only run in the cloud, not at all.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=199.22) [I mean, for sure it will run in the public cloud,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=201.87) [but also your private or hybrid cloud,](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=204.82) [including on‑premises, basically anywhere you've got](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=207.51) [something like Docker or Kubernetes. Aah. Well, with that in the bag, let's crack on with the examples.](https://app.pluralsight.com/course-player?clipId=fd735bac-8bb2-4044-999f-cc6686a3248b&startTime=211.14)

### [Multi-container Apps with Docker Compose](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b)

[Okay, so far,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=1.54) [we've seen how to take the simplest of apps and then use a](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=2.77) [handful of Docker commands to go from code to app,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=6.09) [and that is the bizzo, don't get me wrong,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=9.64) [but it's a bit like 1990s?](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=12.64) [I don't know.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=15.81) [By that I mean it's not exactly scalable, and it is a bit opaque.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=16.43) [Like with all of those Docker commands we've used,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=21.22) [it's never really been obvious what the app does.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=24.51) [Plus, it's not a great way of showing how different app components connect.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=27.13) [Well, a better way is the declarative way,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=32.41) [which, listen,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=37.14) [is basically a fancy word for saying you define everything you](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=38.27) [want in a config file in how it all connects,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=42.29) [and then you just give that config file to Docker and let Docker do the rest.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=45.05) [So, this file here, among other things, it defines a multi‑container,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=50.74) [or a microservices app with a web front‑end and a Redis backend.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=55.59) [And, honestly, we can throw this file at Docker and Docker will,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=60.63) [well, it will build or pull any images it needs,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=65.38) [it will create any networks and volumes and secrets and the likes,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=68.26) [and then it will start the containers.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=71.72) [And I think you're going to love it.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=73.78) [Well, do you know what?](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=77.64) [To do this, we actually need an extra tool called docker‑compose.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=78.56) [However, if you're running Docker Desktop on Mac or Windows, magic!](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=83.05) [You've already got Compose!](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=87.35) [And if you're on Play with Docker, ha, it's there as well!](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=89.08) [However, if you're on Docker on any other platform,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=92.74) [you're probably going to need to manually install it.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=96.33) [But you know what?](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=99.37) [That's dead easy.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=99.95) [Just Google how to install Docker Compose.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=100.91) [I promise it's a piece of cake.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=102.96) [Well, once you've got it,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=106.54) [you're going to need to be in the multi‑container folder](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=108.44) [of the course's GitHub repo. And then, you know what,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=110.8) [actually, let's look through some of the files first.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=116.34) [Now, I'm going to do this from GitHub because it's](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=119.54) [probably a bit easier to read.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=121.67) [Well, this file here is the main app file.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=124.04) [It's a Python Flask app, or actually,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=126.83) [it's a Python Flask app that talks to a Redis cache,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=128.88) [and basically, every time you hit the web page,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=132.25) [it increments a counter in the cache.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=135.39) [Anyway, look, that's the app code.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=137.84) [Well, this file here lists the dependencies,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=140.74) [and we know what the Dockerfile here does.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=143.26) [So, app code here, requirements here,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=145.73) [and instructions on how to build any container images here.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=148.53) [But this Compose file, this is new, and it's pretty exciting, actually.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=153.74) [So look, it is defining two application microservices.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=159.14) [This one called web‑fe is the Python Flask app.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=163.64) [This will call that Dockerfile to build an image and then set](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=167.84) [this as the app to run when a container starts.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=172) [It's saying map port 5000 on the container to 5000 on the Docker host,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=174.9) [it's attaching to this network, and its mounting this volume.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=180.32) [Now, of course, we could do all of this stuff by hand on the command‑line,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=185.34) [but I mean, come on,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=191.44) [it's so much cleaner to document it all here and then leave](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=193.2) [the commands and the hard work to Docker.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=196.73) [However, there is a second service here called Redis,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=199.94) [but this one just pulls a stock image from Docker Hub](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=202.89) [and it attaches to the same network.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=206.11) [And then, of course,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=208.84) [these bits here tell Docker to create a network and a volume.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=209.6) [Now, the power of this declarative approach,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=215.14) [that's what this is here, by the way,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=218.31) [instead of maybe 10 Docker‑specific commands pulled](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=220.09) [together with bits of string in a script,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=223.65) [we define our desired state in a file like this.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=225.81) [So, I want a web front‑end container built from a Dockerfile I'm giving you,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=229.04) [listening on port 5000 on the counter‑net network,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=233.07) [and please mount the counter‑vol volume.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=236.81) [Oh, and I also want a Redis service on the same network.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=239.94) [And do you know what?](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=244.24) [We let Docker care about how to, well, actually build and pull any images,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=245.39) [build and attach to networks all the volume stuff,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=250.1) [and how to start the containers.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=252.92) [Like,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=254.7) [I can't be bothered remembering how to do all of](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=255.35) [that; let's just have Docker do it.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=257.26) [So, and there's more to this, right, but from a developer point of view,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=260.08) [this is way better than remembering a ton of Docker commands.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=266.43) [Plus,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=269.69) [it's actually a great way to document and keep](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=270.36) [track of your multi‑container apps.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=272.9) [Well, then, from an operations perspective,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=276.24) [it's pretty much living documentation, and honestly,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=279.22) [I know that sounds super cheesy,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=283.6) [but while this is the source of truth for Docker when deploying the app,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=285.55) [it's also pretty solid documentation for you in operations,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=290.13) [like you know which images are being used in networks and](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=293.68) [volumes and what ports are exposed.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=296.73) [It's pretty sweet.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=298.94) [Anyway, look,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=301.74) [from within the multi‑container directory containing all of the files,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=302.79) [you'll literally go docker‑compose up.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=306.16) [You know what?](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=310.14) [I'll add the ‑d flag here just to run it detached in the background.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=310.78) [Now,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=314.94) [the command works because Compose expects its config file](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=315.39) [to be called docker‑compose,yaml I mean,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=318.86) [you can call it something different if you want,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=321.2) [but if you do, you need to pass it the file name as a separate argument.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=323.31) [But you know what?](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=327.74) [That's looking good.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=328.66) [So if we list images here, yeah, there's the Redis image,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=330.84) [this one is the Python image pulled to build the actual app image here.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=336.83) [Then if we list containers as well, ugh, don't like that.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=343.04) [And let's see if I can make that a bit better.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=348.54) [Oh, hello.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=351.39) [You know what, that'll do.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=354.64) [I am never fitting all of that on one line.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=355.7) [Anyway, this one is the web front‑end one, and this one the Redis back‑end.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=358.54) [You know what?](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=363.48) [Look, you can list networks and volumes, if you like.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=364.16) [The point being,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=366.83) [loads of Docker constructs built, but from running just a single compose up](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=369.04) [command referencing that moderately easy‑to‑read YAML file.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=374.82) [Anyway, look, we're on port 5000, meaning If you're on Docker Desktop,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=382.14) [you can browse to localhost on 5000, and there's the app.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=387.25) [I suppose I better give that a few clicks.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=392.64) [Kind of rude not to. Whew, that took a while.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=396.14) [No, just kidding.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=400.63) [Look, if you're following along with Play with Docker,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=401.52) [you'll have a button in the UI with the port number on it.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=404.18) [So just click that and you'll see the app, and remember,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=407.21) [give it loads of clicks, yeah? If you're running Docker somewhere else,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=409.91) [it's probably going to be some combination of a host IP address plus port 5000.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=413.52) [But that's it.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=420.14) [I mean, we just used docker‑compose to deploy a multi‑container app.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=421.44) [And if you like your buzzwords, that is a microservices app with two services,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=427.15) [all from a declarative config file and deployed to a single Docker host.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=432.34) [Well, do you know what, to bring the app down, it is just docker‑compose down.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=438.34) [Give it a second.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=444.74) [All right.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=447.24) [Now look, of course there's loads more; there always is.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=448.09) [But right now, at this point,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=452.04) [you know what docker‑compose is, plus you know a bit about declarative](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=453.51) [configuration. Only, I don't know, it's all a bit, I don't know,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=457.99) [laptop‑y, if that makes sense? Actually,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=464.35) [maybe hacky is a better term.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=467.01) [I mean, look,](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=469.07) [it's cracking for local development, but what about something that](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=469.81) [looks and smells a bit more like production? Well, funny you should ask, because that is next on the agenda.](https://app.pluralsight.com/course-player?clipId=dd568fda-cced-4c63-ad7d-9171a48c477b&startTime=473.42)

### [Taking Things to the Next Level with Docker Swarm](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e)

[Right then,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=1.54) [Docker has this mode called swarm mode that lets you](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=2.31) [cluster multiple Docker hosts into a secure,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=6.02) [highly available cluster.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=9.3) [Now, we've got courses that go into way more depth than we're about to,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=12.74) [but what we're about to cover here will give you enough to get a swarm up](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=16.81) [and running and at least wrap your head around what it means to you as](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=20.18) [either an Ops professional or a developer.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=23.75) [Now, on the theory side, the cluster comprises managers and workers,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=27.24) [and actually, we call the cluster a swarm.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=32.34) [So a swarm is a cluster of one or more manager nodes and some worker nodes.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=35.61) [The managers host the control plane features,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=42.04) [so things like scheduling and persisting the state of the](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=45.36) [cluster and the apps that it's hosting.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=48.91) [So, in production, it is really important that the managers are highly available.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=51.06) [Now, the recommendation is to have an odd number, usually three or five.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=56.94) [The odd number is to avoid a split‑brain condition](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=62.62) [where there's maybe a network issue,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=65.23) [and you end up with an equal number of managers on both sides of the split,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=67.95) [because the issue in that situation is that neither](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=73.24) [side knows if they have a majority, and then updates to the cluster are frozen.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=76.43) [Obviously, if you started out with an odd number of managers,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=81.54) [then there's less chance of a split brain.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=85.62) [Like here, this side of the split knows that there were five,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=88.74) [it can't communicate with two anymore, so it knows it has a majority,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=92.76) [and it keeps the cluster open for updates.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=97.64) [Obviously, then,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=101.14) [these over on the other side know that they don't have a majority,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=102.19) [so they won't make updates to the config.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=105.34) [Anyway, managers and worker nodes can be whatever you like,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=108.74) [so on‑prem or in the Cloud, VMs, physicals,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=113.44) [it doesn't matter.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=117.58) [In fact,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=118.39) [all that does matter is that they have Docker installed and](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=118.8) [can communicate over reliable networks.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=122.12) [Now, if you are running with Docker Desktop,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=125.74) [you can still run in swarm mode,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=128.51) [you're just limited to a single manager node that does everything,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=131.21) [so no HA or anything like that, which, might sound kind of like,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=135.68) [well, what's the point Nigel?](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=141.89) [Well, as well as clustering nodes for high availability and the likes,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=144.44) [swarm mode also unlocks additional Docker features,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=148.36) [most notably, services.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=152.71) [Now,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=156.34) [if you just rewind your brain a bit to where we defined what a microservice is,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=157.04) [well, a Docker service, and we'll see one in a second,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=161.23) [but a Docker service maps directly to an application microservice,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=164.39) [but look, we'll get to that in a second.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=169.3) [For now, let's build a quick swarm.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=172.14) [In fact, I'm going to build this one here with three managers and two workers.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=174.24) [Yours can be different, but the process is the same.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=179.26) [In fact, if you're following along on Docker Desktop,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=182.39) [you're just going to do the first step.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=184.84) [Anyway, from one of your Docker nodes, you need to initialize the swarm.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=187.01) [This will make the node that you run the command on,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=191.84) [the first manager node in the swarm or the cluster.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=194.51) [Now, like I said, if you're running on Docker Desktop, this is all you need.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=198.44) [You can hit Return and you'll get a single‑node swarm.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=201.66) [However, on Play with Docker and most other places,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=205.44) [you're going to need to specify this flag here.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=209.56) [What it's doing is telling Docker which of the host IPs](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=211.86) [to use for the cluster communication.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=216.01) [In Play with Docker, you can use the node's 192.168 address.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=218.74) [And if you're in a public cloud like, I don't know,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=223.58) [AWS or whatever, you should just use one of the instance's private IPs.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=226.55) [Anyway, look, we have got a swarm initialized and this node is the first manager.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=232.14) [But I want three for high availability,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=236.29) [so I'll run this command here to get the command to](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=239.74) [securely join a new manager to the swarm.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=243.37) [Now, look, obviously it includes a join ‑‑token,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=247.11) [so keep this safe, but I'll have that,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=250.58) [and I'll run it over here on this node that I want to make the next manager.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=254.44) [Marvelous!](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=259.23) [And the same again for the third manager.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=261.23) [Bingo, right.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=266.74) [At this point, we should have three managers.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=267.69) [Sweet!](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=271.14) [So what are we looking at?](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=273.64) [Well, yes, three managers, and look, node 1 is acting as the leader.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=275.06) [The others are followers,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=278.98) [but they can step in and become leaders If node 1 ever goes down.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=281.34) [Anyway, look, adding workers is pretty much the same.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=286.62) [So if I jump back to node 1 here and then rerun that join ‑‑token command again,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=289.48) [but this time for workers, grab that,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=296.38) [and then run it on the nodes that I want to make workers.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=302.06) [Now, once that's done, run this again, three managers and two workers.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=308.03) [So that's us with a five‑node swarm running three highly](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=319.24) [available managers and a couple of workers.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=323.1) [And, of course, look,](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=325.94) [in the real world you'll distribute all of that across whatever your](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=327.24) [infrastructure failure domains and the likes are, but for us, we're ready to see what it looks like deploying an app to a swarm.](https://app.pluralsight.com/course-player?clipId=ad39a814-e537-48c6-9219-91c51702910e&startTime=330.53)

### [Microservices and Docker Services](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b)

[Okay, so with a swarm up and running,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=1.34) [you unlock a few pretty cool additional Docker features,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=3.44) [one of which, as we said, is the service object,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=7.24) [and another is the docker stack command.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=9.94) [Well, we'll look at service objects first.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=13.04) [And one last time,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=16.03) [a Docker service object maps back to an individual](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=18.63) [service in a microservices app.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=22.84) [So, do you know what, real quick on the old PowerPoint here.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=25.35) [Each one of these application microservices,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=28.24) [each one can be implemented through its own Docker service,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=30.92) [and then you deploy it and manipulate it via the Docker service object.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=35.42) [Yeah, well, look, if trying to figure out that is hurting your head a bit,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=41.24) [don't stress, I'm pretty sure you'll understand it when we actually do it.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=45.88) [But right now, for example, if you need to scale up the microservice,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=50.24) [you do that by altering the docker service associated with it.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=54.59) [Now, look, just to be clear, there's 1, 2,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=59.34) [3, 4, 5, 6, 7, 8 microservices here, so that would be 8 Docker services,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=63.46) [so one for the web stuff, one for the reporting,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=68.2) [another for logging, you get it, yeah?](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=71.07) [Anyway, look,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=73.94) [we're going to take our first look at Docker services via the imperative method](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=74.76) [where we use the Docker command line to manage everything.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=78.96) [Once we're cool with that,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=81.79) [we'll see how to do it all declaratively with the docker](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=83.17) [stack command and a declarative YAML file.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=86.29) [Hoo, okay,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=90.33) [so the command to imperatively create a Docker service is docker service create.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=92.04) [Now, this is only available in swarm mode,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=98.74) [so if you've got Docker and you've not initialized a swarm,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=101.95) [it ain't going to work.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=105.96) [Anyway, look, I will call this particular service,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=107.18) [web, then, as I'm using the same app as before,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=109.85) [I'm going to map 8080 this time to 8080 in the container.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=114.14) [And then this ‑‑replicas here lets us say, funnily enough,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=120.24) [how many replicas of the container we want,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=123.54) [and I reckon 3 for now.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=125.81) [Well, like I just said, we will base it on the same image we used before.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=129.24) [And you're totally welcome to use this image if you're following along,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=134.64) [but you know what, if you were following along and you've built your own,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=137.79) [by all means, use that.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=140.84) [Anyway,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=143.15) [off that goes and Docker is spinning up three identical replicas or](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=143.96) [containers all running from that exact same image.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=149.14) [Now, we can verify stuff with the Docker command line.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=153.64) [So listing the service shows us that three out of the three replicas are up,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=157.34) [and then the usual image and port stuff.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=161.76) [Now, the right way to manipulate the service is with the docker service command,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=165.54) [but, as we can see here, we can go in, I don't know,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=169.8) [sort of through the side door with some of the Docker](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=173.74) [commands that we're already familiar with.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=176.09) [So look there, we can see three containers, magic!](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=179.04) [But remember, a service replica is a container,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=183.83) [so we asked for three service replicas, and we've got three containers.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=187.55) [Ha ha!](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=191.94) [However, if you're running this kind of command on a multi‑node swarm,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=192.94) [then docker container ls is only going to show you the](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=199) [containers running on the local node.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=202.17) [So if you're on like a five‑node swarm,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=204.93) [you're not going to see all three with this command.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=207.29) [Like I said before, the better command is docker service ps.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=210.84) [Well, for starters, you can run this on any manager and see all replicas.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=216.54) [Plus, you get to see the node that each replica is running on.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=220.37) [Now, okay, I didn't tell you this earlier on,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=224.04) [I've actually flipped back to a single‑node swarm in Docker Desktop,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=226.6) [so I've only got a single‑node cluster.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=230.85) [But, if you built a proper swarm in, like,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=233.23) [Play with Docker or somewhere else,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=236.47) [you'll see replicas load balanced across all nodes in the cluster.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=238.14) [Either way, though, do you know what, three identical containers,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=244.54) [and all up and running.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=247.19) [But, I always say, believing what Docker tells us is one thing,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=249.23) [seeing it with our own eyes is another.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=253.63) [So, like I just said, I'm on Docker Desktop,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=256.24) [so it'll be localhost and 8080 this time.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=258.12) [And there's that web server again, only this time,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=262.64) [take note of the container that serviced the request here.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=266.14) [If we hit Refresh a few times, look,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=269.88) [we see that cycle through the three container replicas.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=272.76) [You see that, yeah?](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=276.57) [Now, these names match back to the container names on the command line here.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=279.64) [And this is magic, right?](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=286.14) [Only, do you know what, it is not even the half of it.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=287.53) [So, we can scale the number of replicas with docker service scale,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=292.14) [and then just the name of the service, and however many we want,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=297.28) [and off that goes.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=301.48) [And if we check, ha, that looks like ten to me,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=305.54) [and actually, see how some of them are newer than the others.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=310.67) [These will be the new ones.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=314.27) [But then, let's say we take an ax to it, maybe the top three.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=317.34) [Give me a second, ha, ha, ha.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=326.04) [Okay,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=329.94) [so this will go in through that side door that I mentioned](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=330.33) [before and destroy three containers.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=332.71) [Uh‑oh, oh, okay, yeah.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=337.24) [I need to force that.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=341.26) [Okay, they should be gone.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=344.34) [Only, if I give this, I don't know, maybe 2 or 3 seconds,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=346.94) [and then we give it another try, check that out,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=350.86) [we're back up to 10, and actually 3 of them lock in very new.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=353.98) [So, what happened there?](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=359.64) [Well, Docker knows we'd asked for 10, so it recorded that as our desired state.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=362.24) [But then we went in through the side door,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=369.64) [so not using the docker service command,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=371.78) [and we blew three of them away, basically a crude way of simulating failures.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=373.97) [Anyway, Docker was like, well, look, I'm supposed to have 10,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=379.54) [but for, well, whatever reason, I've only got 7.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=383.06) [So, it fired 3 new ones up and took us back to our desired state of 10.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=386.78) [And all of that cleverness is managed via a reconciliation loop that](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=393.14) [is constantly watching the state of the cluster and comparing the](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=398.11) [observed state with our desired state,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=402.34) [with the goal of the loop being that observed state](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=404.62) [should always match our desired state.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=407.07) [Now, look,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=411.84) [if I'd gone in through the front door and changed the](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=413.44) [state with the docker service command like I did with the](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=415.94) [docker service scale earlier on, then it's all good.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=418.4) [Docker knows that any of those changes are intentional.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=422.13) [But if we use other Docker commands or, of course,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=425.64) [if something actually crashes or a node fails and we](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=428.46) [drop from our desired state of 10,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=431.23) [then Docker knows that it's not intentional and it tries to fix it.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=433.15) [But I'm waffling, look, that's the imperative way,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=438.04) [and, yeah, it's okay,](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=440.97) [but a much better way is the declarative way with the docker](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=443.98) [stack command and a declarative YAML file. Let's see it.](https://app.pluralsight.com/course-player?clipId=bcdab680-6c3a-4d52-816a-7f469476fe2b&startTime=447.15)

### [Multi-container Apps with Docker Stacks](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02)

[Okay, so let's do all that again, yeah? Hey,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=1.44) [it wasn't that bad! Anyway, look,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=5.76) [this time we'll do it all again using a declarative YAML file.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=8.17) [Because, like I said before, documenting an app configuration in a YAML file,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=12.08) [it just helps on so many levels.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=17.72) [Well, as a quick reminder, the most obvious of which,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=21.34) [or at least one of the most obvious, is that you actually](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=24.79) [have your app documented somewhere.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=27.94) [And from an ops perspective,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=30.41) [that is like sit down and breathe into a paper bag to contain](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=32.73) [your excitement. But as well, in the dev world,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=36.05) [it makes it so much easier for you to pick up an app later on](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=39.7) [down the line and easily refresh your memory.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=43.22) [Or, do you know what, even bring someone else on the team or even a](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=45.67) [new hire up to speed. Just give them the YAML, and it's pretty easy](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=49.07) [to figure out the anatomy of the app.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=53.87) [Whew! Anyway, first things first.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=57.24) [Let's clean up any running services left over from the last lesson.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=59.84) [So, I'm going to go in through the front door, yeah.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=63.64) [That'll be docker service rm, and then the name of the service.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=65.72) [And we'll do a quick verify, and then, do you know what?](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=71.23) [Why not? A double check with this. Give it a sec, actually.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=74.56) [Okay,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=80.94) [we're good to go. So, here in the swarm‑stack folder of the](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=81.39) [GitHub repo, we've got another app, which, do you know](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=86.55) [what, if I'm perfectly honest,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=91.3) [is almost identical to the one that we use with docker‑compose.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=92.37) [In fact, do you know what if we open up the compose file,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=95.71) [yeah, it's got a web front‑end and Redis cache.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=100.84) [So, the app that counted the number of page hits,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=104.64) [only this time it also returns the name of the](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=107.27) [container that served the request.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=110.32) [Now, then, because we're running this app in Docker swarm mode,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=113.34) [we call the app a stack.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=118.24) [So this file describing the app with two services is](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=121.64) [describing the stack. Now, out of interest here,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=124.99) [stacks on a swarm do not support building images on the fly.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=129.74) [So, in the compose example earlier,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=137.04) [this web front‑end image was built on the fly using a Docker file.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=139.82) [Well, stacks can't do that.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=143.78) [I guess they're more of a production tool where you're probably](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=146.17) [not going to be building at deploy time. Anyway,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=149.68) [this time, the web front‑end image needs to be pre‑created.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=152.34) [Now, of course, in the real world,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=156.84) [it'll have been through all different tests and the likes.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=158.46) [But also,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=161.34) [it'll need storing in a registry so that all of the nodes in the cluster](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=162.86) [can access and pull it. We'll come to that in a second,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=167.58) [actually.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=170.35) [Now as well, this block here,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=172.24) [deploy.replicas equals 10, this is saying give us 10 replicas of](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=174.64) [this service. So, similar to what we did imperatively a minute](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=179.26) [ago, yeah. But aside from those bits,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=182.01) [it is pretty much a compose file like we saw before.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=185.35) [So let's go and deploy it. Now, we said the image](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=188.59) [for the app needs to be pre‑built, so we'd better do that first.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=194.49) [Obviously,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=198.44) [we've got the Docker file here with the build instructions, so we go docker](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=199.11) [image build, we'll tag it as, hmm, what did I call it?](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=203.02) [Oh yeah, well,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=211.34) [you know what, might as well copy that. There we](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=212.18) [go. And don't forget the period.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=214.57) [Remember? That says use the Docker file and the app stuff in](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=217.78) [the current directory, and off it goes. Yeah,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=222.25) [go on.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=228.03) [I will cast aside the laws of physics again to speed that up.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=228.42) [Cool. Now,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=232.64) [as I'm on Docker desktop, I could crack on at this point is](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=234.18) [I've got the image locally in only one node.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=236.95) [But if you are running a multi‑node cluster like you will in production,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=240.14) [you'll need to push that to a registry so that every node can access it.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=244.23) [Give that a second.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=250.04) [Okay, so look, with the image built and the registry,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=253.94) [we go docker stack deploy, the ‑c flag to tell it we're deploying from a](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=257.18) [compose file, and then we'll call the stack now counter.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=263.23) [Now, that's the name of the app.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=268.78) [We'll see it in a second.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=271.33) [Okay,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=274.14) [look, we can see it's built the network, then it's](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=274.7) [deployed the two microservices.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=277.38) [Now, the docker stack command is pretty versatile,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=280.24) [and it lets you list and introspect running stacks.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=282.97) [Obviously, we've only got one running,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=287.64) [but we can see that both of the services in the stack are up.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=289.12) [You can see more detail on each services in the stack,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=294.04) [and you can see each container. Now the name of the service or](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=299.44) [the microservice as defined in the YAML file is embedded as](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=308.61) [part of the container name. Check.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=312.08) [But you know what, let's see if it is actually running.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=316.34) [Oh, actually look, this is on port 5000.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=319.36) [I just mapped it that way in the YAML file.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=322.93) [But localhost and 5000, and there we are.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=325.24) [And you know what?](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=330.64) [I don't know, I might make this look a bit fancier in the future,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=331.64) [so don't be surprised if it looks different when you're deploying it.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=334.34) [But the important thing is, right, that if we hit refresh, yep,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=338.15) [the counter increments, but also the container ID here changes as well.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=341.22) [Now that's because we've got 10 replicas of the web container running](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=346.43) [and requests are being balanced across them all.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=350.54) [But also, if you scale up and down,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=353.77) [your requests get automatically balanced against any new](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=356.63) [containers added. Though, I must point out,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=359.87) [this is layer three load balancing, and it's pretty crude.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=363.73) [It's not application or well layer 7 stuff.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=367.04) [Well, anyway, look,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=370.94) [one last thing, a recommended way to increase and](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=371.91) [decrease the number of replicas, or, to be honest,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=375.43) [make any changes to the stack, is to crack open the same application](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=377.66) [YAML file, which in the real world, I am really hoping you're going to](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=382.34) [be keeping in a version control system. Anyway, crack that open, and](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=386.94) [you make your desired changes.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=391.84) [So, we'll change the number of replicas,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=393.45) [give it a save,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=395.74) [and then just rerun that docker stack deploy command, and Docker takes care](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=398.4) [of realizing that this is an update to an existing stack,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=404.4) [and it goes about updating the relevant bits. And the beauty of doing](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=407.63) [it this way, so checking out the config file, recording your updates](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=413.1) [in there, and then using that updated file to change the state of the](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=417.75) [app on the cluster, the beauty of that is that your YAML file is](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=421.67) [always up to date and remains that source of truth for both developers](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=426.01) [and operations.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=430.92) [And on that note, folks, oh, actually, no.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=433.34) [Let's just tear it all down first with a docker stack rm, I think we](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=437.61) [called it counter, yeah. And this time for sure we are done with the](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=442.24) [demos .But stick around for maybe, I don't know,](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=448.03) [maybe 2 more minutes while I list out some of the courses I](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=452.28) [recommend you take next as you crack on adding more and more](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=455.76) [vital Docker skills to your resume. See you there.](https://app.pluralsight.com/course-player?clipId=03370c57-235a-4940-9d00-8c75c87aaa02&startTime=459.22)

## [What's Next?](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5)

### [What's Next?](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5)

[Wow! We're all done.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=1.54) [Well, first off, let me congratulate you on making it to the end.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=4.44) [An hour and a bit of listening to me? Ha! That is no easy ride.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=8.63) [No, but seriously, congrats on completing the course.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=13.54) [I am genuinely excited for you.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=17.04) [I mean, you've got the fundamentals of Docker and containers now,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=20.24) [and you're more than ready to press ahead with further mastery, which,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=23.92) [on that note, you're in luck,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=28.55) [because we are living in, what I see at least, as a](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=30.47) [golden age of technology learning.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=33.96) [I mean here at Pluralsight, we've just got so much content for you.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=37.24) [Like we've got the developer learning path and an operations](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=42.51) [learning path, and I highly recommend both, and I'm hoping](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=46.24) [you'll take courses from them.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=49.41) [And remember,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=51.64) [we're building them out all of the time, but we've also got standalone](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=52.14) [courses that I mentioned earlier, and couple of highlights are Dan's Docker](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=56.53) [for Web Developers, and my own Docker Deep Dive; well,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=60.23) [if you can stand any more time with me, that is.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=63.74) [But the thing is,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=66.94) [these are just the highlights. Have a proper look, and I promise,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=68.66) [you won't be disappointed. And as well as that, though, Kubernetes](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=71.76) [is very much in the mix with containers.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=77.27) [And you know what?](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=79.43) [We've got you well and truly covered with that here at Pluralsight as well.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=80.62) [I've got a Getting Started with Kubernetes course that I](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=83.83) [suppose is very much like this, only it does actually go a bit](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=87.3) [further and into a bit more depth,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=90.9) [but as well, we've obviously got a ton of learning paths for Kubernetes as well.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=92.94) [Now away from Pluralsight, but sticking to Docker,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=98.94) [we've introduced you to a great tool here called Docker Desktop.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=102.03) [It is a properly good tool for both learning and working with both](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=106.64) [Docker and Kubernetes, and I highly recommend you install it and](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=111.9) [just get your hands as dirty as possible.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=115.29) [And I reckon on that note, I'm Nigel Poulton, and I don't know about you,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=118.94) [but I have massively enjoyed sharing this course with you.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=124.42) [So feel free to connect and reach out, and look out for your local meet‑ups and,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=127.17) [well, other industry events.](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=133.18) [I mean, I used to highlight container‑specific events, but you know what?](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=134.79) [These days,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=138.94) [just about every major tech conference has a strong container focus anyway,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=139.74) [so yeah,](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=144.64) [look, thanks for your time, and keep in touch, and let me](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=145.8) [know how you like the course and how your container journey is progressing. Ciao! Ciao!](https://app.pluralsight.com/course-player?clipId=e58a19f2-8237-49bf-b1ec-1ffe3ee8b1e5&startTime=148.66)