

SQL Server Cluster Installation Checklist

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1. Prerequisites

- Installation media
 - ☐ SQL Server 2008 R2 x64 Developer/Enterprise Edition
 - ☐ SQL Server 2008 R2 x64 Service Pack 2
 - ☐ SQL Server 2008 R2 x64 Service Pack 2 CU4
 - ☐ Windows 2008 R2 x64 Enterprise Edition

- Storage
 - ☐ Data Disk
 - ☐ Log Disk
 - ☐ Tempdb Disk

- IP Addresses
 - ☐ Cluster
 - ☐ MSDTC
 - ☐ SQL Server Instance

- Network Names
 - ☐ Cluster
 - ☐ MSDTC
 - ☐ SQL Server Instance

- Service Accounts
 - ☐ Cluster
 - ☐ MSDTC
 - ☐ SQL Server Instance
 - ☐ SQL Server Agent

2. Installation checklist

Windows OS Installation

1. All drives partition aligned.	<input type="checkbox"/>
2. Hyper threading disabled in the Bios (if appropriate)	<input type="checkbox"/>
3. OS and installed applications drive use NTFS with default Allocation Unit Size.	<input type="checkbox"/>
4. If possible, use RAID 1 for OS and applications drive	<input type="checkbox"/>
5. OS installed to C Drive.	<input type="checkbox"/>
6. Domain Administrators group added to the Local Administrators group.	<input type="checkbox"/>
7. Account Policies enforced by GPO or set explicitly.	<input type="checkbox"/>
1. Password Policy	<input type="checkbox"/>
1. Enforce password history = Last 10	<input type="checkbox"/>
2. Maximum password age = 90 days	<input type="checkbox"/>
3. Minimum password age = 7 days	<input type="checkbox"/>
4. Minimum password length = 8	<input type="checkbox"/>
5. Password must meet complexity requirements = Enabled	<input type="checkbox"/>
2. Account Lockout Policy	<input type="checkbox"/>
1. Account lockout threshold = 5 invalid login attempts	<input type="checkbox"/>
8. Local Policies enforced by GPO or set explicitly.	<input type="checkbox"/>
1. Audit Policy set to audit Success and Failure of	<input type="checkbox"/>
1. Audit account logon events	<input type="checkbox"/>
2. Audit account management	<input type="checkbox"/>
3. Audit logon events	<input type="checkbox"/>
4. Audit policy change	<input type="checkbox"/>
5. Audit system events	<input type="checkbox"/>
2. Security Options	<input type="checkbox"/>
1. Interactive logon: Do not display last user name – Enabled	<input type="checkbox"/>
2. Interactive logon: Message text for users attempting to log on – Set to Legal Disclaimer for access to production servers	<input type="checkbox"/>
3. Interactive logon: Message title for users attempting to log on – Set to Legal Message Titled for access to production servers.	<input type="checkbox"/>
9. Everyone User removed from non-C drives.	<input type="checkbox"/>
10. All applications installed to D Drive and not C Drive.	<input type="checkbox"/>
11. Windows Updates configured to download but not install.	<input type="checkbox"/>
12. Windows page file on C Drive set to 2 GB	<input type="checkbox"/>
13. NIC's configured as teamed (if appropriate), set to Full Duplex and maximum network speed (usually 1GB).	<input type="checkbox"/>
14. Disable unused NICs	<input type="checkbox"/>
15. Adjust the binding order of the network adapters (primary public NIC first)	<input type="checkbox"/>
1. Watch out for hidden adapters: http://sirsql.net/blog/2011/5/12/sql-clusteringnetwork-binding-order-warnings.html	<input type="checkbox"/>
16. Check that Netbios is disabled for the heartbeat NIC	<input type="checkbox"/>
17. Disable settings autodetection (speed and duplex mode) for the Heartbeat NIC	<input type="checkbox"/>
18. Check that DNS and default gateway are disabled for the heartbeat NIC	<input type="checkbox"/>

19. Disable TCP Chimney offload	<input type="checkbox"/>
20. Turn off the firewall	<input type="checkbox"/>
21. Disable power management	<input type="checkbox"/>
22. Disable the recycle bin	<input type="checkbox"/>
23. Validate IO Subsystem configuration is optimal using SQLIO and test alternate configurations to determine optimum configuration for SQL.	<input type="checkbox"/>
24. If using SAN Storage test HBA Queue Depth settings at 64 and 128 in conjunction with SAN admin to determine the optimal setting for the server based on IO demands and impact to other systems using the SAN, ensure that MPIO is configured properly. (Going to high on the SQL Server can allow it to dominate the SAN, reducing performance of other systems using SAN storage on different disk arrays)	<input type="checkbox"/>
25. Anti-Virus Software installed and configured to update from root server.	<input type="checkbox"/>
26. System Added to monitoring system (SCOM, BigBrother etc...).	<input type="checkbox"/>
27. Set the system to optimize for background services (system properties, advanced settings)	<input type="checkbox"/>
28. Install all patches and updates	<input type="checkbox"/>

Cluster Pre-Installation

1. Check network connectivity on all interfaces	<input type="checkbox"/>
2. Check power redundancy, and network redundancy	<input type="checkbox"/>
3. Check the HBA firmware version and update it if appropriate	<input type="checkbox"/>
4. Check and document the multipathing strategy (active/active or just failover?)	<input type="checkbox"/>
5. Test multipathing and failover.	<input type="checkbox"/>
1. Copy a huge file to each array simultaneously	<input type="checkbox"/>
2. Pull out one fiber cable	<input type="checkbox"/>
3. Watch to make sure the copy continues	<input type="checkbox"/>
4. Check the file integrity at the end of the copy	<input type="checkbox"/>
5. Repeat with the other fiber cable	<input type="checkbox"/>
6. Repeat disabling one zone of the SAN for the server	<input type="checkbox"/>

Cluster Installation

1. Restart both nodes	<input type="checkbox"/>
2. Create a Quorum disk (size 1 GB NTFS)	<input type="checkbox"/>
3. Create Data Disk, Log Disk and Tempdb Disk for each instance in the cluster. Remember alignment and cluster size.	<input type="checkbox"/>
4. Attach the storage to both nodes in turn	<input type="checkbox"/>
5. Add the Application Server role to the nodes	<input type="checkbox"/>

1. Select the Application Server Foundation, Incoming Remote Transactions and Outgoing Remote Transactions role services	<input type="checkbox"/>
6. Add the Failover Clustering Server Role	<input type="checkbox"/>
7. Run the Cluster Validation Wizard	<input type="checkbox"/>
1. Run all tests	<input type="checkbox"/>
8. Provision IP addresses and Virtual names for services and the cluster itself	<input type="checkbox"/>
9. Create the cluster from the Failover Cluster Management console, New Cluster Wizard	<input type="checkbox"/>
2. Enter cluster name and IP address	<input type="checkbox"/>
3. Check the Cluster resource group	<input type="checkbox"/>
4. Check the Quorum disk (The Wizard may have picked the wrong disk).	<input type="checkbox"/>
1. In case of wrong setup, configure Quorum settings	<input type="checkbox"/>
2. Node and disk majority	<input type="checkbox"/>
3. Configure Storage Witness to use the Quorum disk	<input type="checkbox"/>
10. Create a MSDTC disk (size 4 GB NTFS)	<input type="checkbox"/>
11. Create the MSDTC resource on the cluster (Cluster Manager, configure services and applications)	<input type="checkbox"/>
1. DTC resource type	<input type="checkbox"/>
2. Enter DTC resource name and IP address	<input type="checkbox"/>

Pre-Installation of SQL Server

1. Separate RAID Arrays for Data and Log files. Tempdb on dedicated array.	<input type="checkbox"/>
2. Data, Log, and Tempdb drives formatted with 64K Allocation Unit Size.	<input type="checkbox"/>
3. SQL Server Admins Group added to the Local Administrators Group.	<input type="checkbox"/>
4. Create AD Service User Account, or Local User Account for non-domain servers, with no permissions.	<input type="checkbox"/>
1. Add the readServicePrincipalName and writeServicePrincipalName permissions to the Service Account in AD (http://support.microsoft.com/kb/319723)	<input type="checkbox"/>
5. Configure the Data drive with Drive letter E in Windows.	<input type="checkbox"/>
6. Configure the Log drive with Drive letter L in Windows.	<input type="checkbox"/>
7. Configure the TempDB drive with Drive letter T in Windows.	<input type="checkbox"/>
8. Configure additional Data drives with Drive letter F, G, etc. skipping previously reserved Drive letters and M (cluster MSDTC) and Q (cluster Quorum).	<input type="checkbox"/>
9. Add the AD Service User Account to the Root path with Full Control of D, and List Folder Contents Permissions for Data, Log and Tempdb Drives.	<input type="checkbox"/>
10. Create SQLData folder on Data and Tempdb Drives	<input type="checkbox"/>
11. Add the AD Service User Account with Full Control of SQLData folder on Data and Tempdb Drives	<input type="checkbox"/>
12. Create SQLLogs folder on Log Drive	<input type="checkbox"/>

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| 13. Add the AD Service User Account with Full Control of SQLLogs folder on Log Drive | <input type="checkbox"/> |
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SQL Server Installation

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| 1. Clear event logs in Windows | <input type="checkbox"/> |
| 2. Slipstream SPs and CUs in the installation media | <input type="checkbox"/> |
| 3. Use the “Add node to cluster” setup option | <input type="checkbox"/> |
| 1. Enter the Virtual Server name when prompted for the SQL Server Network Name | <input type="checkbox"/> |
| 2. Enter Instance name | <input type="checkbox"/> |
| 3. Install the binaries to the local D Drive. | <input type="checkbox"/> |
| 4. Enter the cluster resource group | <input type="checkbox"/> |
| 5. Select shared disks | <input type="checkbox"/> |
| 6. Enter IP address of the virtual server | <input type="checkbox"/> |
| 1. Uncheck DHCP | <input type="checkbox"/> |
| 2. Uncheck the IPv6 box | <input type="checkbox"/> |
| 7. Use service SIDs as security policy | <input type="checkbox"/> |
| 8. Use the previously configured Service Account as the startup account for the SQL Service. | <input type="checkbox"/> |
| 4. If installing SQL Server 2008 set the default file paths according to the previous drive configuration. | <input type="checkbox"/> |
| 5. Set SQL Server and SQL Agent to startup Automatically. Disable the Browser Service unless installing Named Instances or multiple instances on the Server. | <input type="checkbox"/> |
| 6. Apply latest Service Pack and Cumulative Update based on SQL Server version. | <input type="checkbox"/> |
| 7. Provision SQL Admins group in the sysadmin fixed server role. | <input type="checkbox"/> |
| 8. Review the Event log for errors. If ok, clear it. | <input type="checkbox"/> |
| 9. Add the second node | <input type="checkbox"/> |
| 1. Watch out for the “invalid SKU” error: http://forums.techarena.in/windows-server-help/1032365.htm | <input type="checkbox"/> |
| 10. Review the Event log for errors | <input type="checkbox"/> |
| 11. Fail-over to the second node | <input type="checkbox"/> |
| 12. Review the Event log for errors. If ok, clear it. | <input type="checkbox"/> |
| 13. Configure possible owners, fallback and preferred owners of the resources. | <input type="checkbox"/> |
| 14. Configure dependencies and fail group properties of the resources. | <input type="checkbox"/> |

Post-Installation Steps

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| 1. Add the SQLServerMSSQLUser\$<ServerName>\$<InstanceName> group to the Root path with Full Control of D, and List Folder Contents Permissions for Data, Log and Tempdb Drives. | <input type="checkbox"/> |
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2. Add the SQLServerMSSQLUser\$<ServerName>\$<InstanceName> group with Full Control of SQLData folder on Data and Tempdb Drives.	<input type="checkbox"/>
3. Add the SQLServerMSSQLUser\$<ServerName>\$<InstanceName> group with Full Control of SQLLogs folder on Log Drive.	<input type="checkbox"/>
4. Remove the AD Service User Account from the Root Path. (This decouples the Service Account explicitly and relies on the group)	<input type="checkbox"/>
5. Add the SQLServerMSSQLUser\$<ServerName>\$<InstanceName>, SQLServerSQLAgentUser\$<ServerName>\$<InstanceName>, or other group accounts to any Backup, or processing folders as needed.	<input type="checkbox"/>
6. In the Local Security Policy, add the SQLServerMSSQLUser\$<ServerName>\$<InstanceName> group to the Perform Volume Maintenance Tasks and Lock Pages in Memory (if appropriate) objects.	<input type="checkbox"/>
7. Exclude Data, Log, Tempdb, any Backup file paths, the quorum disk and the SQL Server Binaries folders from AntiVirus Scans.	<input type="checkbox"/>
8. Remove Builtin\Admins from sysadmin fixed server role.	<input type="checkbox"/>
9. Enable Failed Login Auditing in the SQL Server Security Settings	<input type="checkbox"/>
10. Enable TCP/IP and change default port from 1433.	<input type="checkbox"/>
11. Enable remote DAC connections.	<input type="checkbox"/>
12. Enable as required xp_cmdshell, SQLCLR, and OLE Automation for the SQL Server Instance.	<input type="checkbox"/>
1. Configure xp_cmdshell proxy account as required.	<input type="checkbox"/>
13. Enable DatabaseMail and configure default public and private accounts.	<input type="checkbox"/>
14. Configure SQL Error Log retention for 30 log files	<input type="checkbox"/>
15. Configure SQL Agent job to perform nightly log rollover.	<input type="checkbox"/>
16. Configure SQL Agent jobs for database backups, CHECKDB, index maintenance, statistics updates, backup cleanup, and history cleanup.	<input type="checkbox"/>
17. Move MSDB Database files to SQLData and SQLLogs respectively.	<input type="checkbox"/>
18. Reconfigure Tempdb with data files equal to 1/2-1/4 the physical CPU's on the server based on load characteristics. Set data files to the same size based on load characteristics in 4096MB increments for Datafiles, and 1024MB increments for Log files. Set AutoGrowth to 1024MB for data files and 512MB for Log file.	<input type="checkbox"/>
19. Enable Trace Flag 1118 on SQL Server 2000 and SQL Server 2005 for Tempdb.	<input type="checkbox"/>
20. Set Model database to SIMPLE recovery, 2048MB default datafile size and 1024MB default logfile size. Set AutoGrowth to 1024MB for data files and 512MB for Log file.	<input type="checkbox"/>
21. Set Max Server Memory based on installed RAM and installation type (Newer Servers are all 64bit, but enable AWE as needed on 32 bit servers).	<input type="checkbox"/>
8GB RAM = 6144 Max Server Memory 16GB RAM = 12228 Max Server Memory 32GB RAM = 28672 Max Server Memory These are base values that will later be adjusted based on the Memory\Available MBytes counter being > 150 on the Server.	
22. Set max degree of parallelism sp_configure option based on the number of physical CPU cores installed and anticipated workload	<input type="checkbox"/>
For OLTP, generally set to 1/2 or 1/4 of the physical cores available on the server. Adjusted up or down based on wait stats and load.	
23. Set cost threshold of parallelism sp_configure option based on the anticipated load.	<input type="checkbox"/>

General default value of 5 is low for most OLTP workloads and should be increased.
Base value of 20-25 used for most server installs.

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| 24. Add AD login (standard for environment and locked out in AD by default) for patching and emergency server access to Local Administrators Group. | <input type="checkbox"/> |
| 25. Set SA user password to standardized password that is changed quarterly on all servers and maintained in password safe. | <input type="checkbox"/> |
| 26. Configure Database Mail | <input type="checkbox"/> |
| 27. Configure SQL Server Agent failsafe operator | <input type="checkbox"/> |
| 28. Create Alerts for errors severity 16-25 and number 823, 824 and 825 | <input type="checkbox"/> |
| 29. Install all patches and updates for Windows | <input type="checkbox"/> |
| 30. Install SQL Server Service Packs and CUs | <input type="checkbox"/> |
| 31. Install the backup client | <input type="checkbox"/> |
| 32. Backup all databases | <input type="checkbox"/> |
| 33. Test restore | <input type="checkbox"/> |
| 34. Run a test workload and test performance | <input type="checkbox"/> |

3. Objects to migrate

The following list contains all the object types that must be migrated manually with additional scripts:

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| • ALERT | <input type="checkbox"/> |
| • AUDIT | <input type="checkbox"/> |
| • BACKUP DEVICE | <input type="checkbox"/> |
| • CATEGORIES | <input type="checkbox"/> |
| • CERTIFICATE | <input type="checkbox"/> |
| • CLR | <input type="checkbox"/> |
| • CONFIGURATION | <input type="checkbox"/> |
| • CREDENTIAL | <input type="checkbox"/> |
| • CRYPTOGRAPHIC PROVIDER | <input type="checkbox"/> |
| • DATA COLLECTOR | <input type="checkbox"/> |
| • DATABASE | <input type="checkbox"/> |
| • DATABASE MAIL | <input type="checkbox"/> |
| • DISTRIBUTION DB | <input type="checkbox"/> |
| • DTS PACKAGE | <input type="checkbox"/> |
| • ENDPOINT | <input type="checkbox"/> |
| • EVENT NOTIFICATION | <input type="checkbox"/> |
| • JOB | <input type="checkbox"/> |
| • LINKED SERVER | <input type="checkbox"/> |
| • LOG SHIPPING | <input type="checkbox"/> |
| • LOGIN | <input type="checkbox"/> |

• MAINTENANCE PLAN	<input type="checkbox"/>
• MESSAGES	<input type="checkbox"/>
• OPERATOR	<input type="checkbox"/>
• PBM POLICY	<input type="checkbox"/>
• PERMISSION	<input type="checkbox"/>
• PROXIES	<input type="checkbox"/>
• REGISTRY CONFIGURATION	<input type="checkbox"/>
• REPLICATION	<input type="checkbox"/>
• RESOURCE GOVERNOR	<input type="checkbox"/>
• ROLE MEMBER	<input type="checkbox"/>
• SCHEDULE	<input type="checkbox"/>
• SERVER TRIGGER	<input type="checkbox"/>
• SERVICE BROKER	<input type="checkbox"/>
• SSIS PACKAGE	<input type="checkbox"/>
• UCP	<input type="checkbox"/>
• XE EVENT SESSION	<input type="checkbox"/>
• XE SESSION	<input type="checkbox"/>