SQL Server
Cluster Installation Checklist

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1. Prerequisites

- Installation media
  - SQL Server 2014 x64 Developer/Enterprise Edition ☐
  - SQL Server 2014 x64 Service Pack 1 ☐
  - SQL Server 2014 x64 Service Pack 1 CU5 ☐
  - Windows 2012 R2 x64 Enterprise Edition ☐

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

- IP Addresses
  - Cluster ☐
  - SQL Server Instance ☐

- Network Names
  - Cluster ☐
  - SQL Server Instance ☐

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

2. Installation checklist

Windows OS Installation

1. All drives partition aligned. ☐
2. Hyper threading disabled in the Bios (if appropriate) ☐
3. OS and installed applications drive use NTFS with default Allocation Unit Size. ☐
4. If possible, use RAID 1 for OS and applications drive ☐
5. OS installed to C Drive. ☐
6. Domain Administrators group added to the Local Administrators group. ☐
7. Everyone User removed from non-C drives. ☐
8. All applications installed to D Drive and not C Drive. [optional] ☐
9. Windows Updates configured to download but not install. ☐
10. Windows page file on C Drive set to 2/4 GB ☐
11. NIC's configured as teamed (if appropriate), set to Full Duplex and maximum network speed (usually 1GB). ☐
12. Disable unused NICs ☐
13. Adjust the binding order of the network adapters (primary public NIC first) ☐
    1. Watch out for hidden adapters: http://sirsql.net/blog/2011/5/12/sql-clusteringnetwork-binding-order-warnings.html ☐
14. Check that Netbios is disabled for the heartbeat NIC ☐
15. Disable settings autodetection (speed and duplex mode) for the Heartbeat NIC ☐
16. Check that DNS and default gateway are disabled for the heartbeat NIC ☐
17. Disable TCP Chimney offload [optional] ☐
18. Turn off the firewall ☐
19. Disable power management ☐
20. Disable the recycle bin for data disks ☐
21. Validate IO Subsystem configuration is optimal using SQLIO and test alternate configurations to determine optimum configuration for SQL. ☐
22. 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) ☐
23. Anti-Virus Software installed and configured to update from root server. ☐
24. System Added to monitoring system (SCOM, BigBrother etc…). [optional] ☐
25. Set the system to optimize for background services (system properties, advanced settings) ☐
26. Install all patches and updates ☐

Cluster Pre-Installation

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

Cluster Installation

1. Restart both nodes ☐
2. Create a Quorum disk (size 1 GB NTFS) ☐
3. Create Data Disk, Log Disk and Tempdb Disk for each instance in the cluster. Remember alignment and cluster size. ☐
4. Attach the storage to both nodes in turn ☐
5. Add the Application Server role to the nodes ☐
    1. Select the Application Server Foundation, Incoming Remote Transactions and Outgoing Remote Transactions role services ☐
6. Add the Failover Clustering Server Role ☐
7. Run the Cluster Validation Wizard ☐
    1. Run all tests ☐
8. Provision IP addresses and Virtual names for services and the cluster itself ☐
9. Create the cluster from the Failover Cluster Management console, New Cluster Wizard ☐
    2. Enter cluster name and IP address ☐
    3. Check the Cluster resource group ☐
    4. Check the Quorum disk (The Wizard may have picked the wrong disk). ☐
        1. In case of wrong setup, configure Quorum settings ☐
        2. Node and disk majority ☐
        3. Configure Storage Witness to use the Quorum disk ☐

Pre-Installation of SQL Server

1. Separate RAID Arrays for Data and Log files. Tempdb on dedicated array. ☐
2. Data, Log, and Tempdb drives formatted with 64K Allocation Unit Size. ☐
3. SQL Server Admins Group added to the Local Administrators Group. ☐
4. Create AD Service User Account, or Local User Account for non-domain servers, with no permissions. ☐
    1. Add the **readServicePrincipalName** and **writeServicePrincipalName** permissions to the Service Account in AD (http://support.microsoft.com/kb/319723) ☐
5. Configure the Data drive in Windows and add as a cluster disk. ☐
6. Configure the Log drive in Windows and add as a cluster disk. ☐
7. Configure the TempDB drive in Windows and add as a cluster disk. ☐

SQL Server Installation

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

11. Fail-over to the second node ☐
12. Review the Event log for errors. If ok, clear it. ☐
13. Configure possible owners, fallback and preferred owners of the resources. ☐
14. Configure dependencies and fail group properties of the resources. ☐

Post-Installation Steps

1. In the Local Security Policy, add the SQL Server service account to the **Perform Volume Maintenance Tasks** and **Lock Pages in Memory** (if appropriate) objects. ☐
2. Exclude Data, Log, Tempdb, any Backup file paths, the quorum disk and the SQL Server Binaries folders from AntiVirus Scans. ☐
3. Remove Builtin\Admins from sysadmin fixed server role. ☐
4. Enable Failed Login Auditing in the SQL Server Security Settings ☐
5. Enable TCP/IP and change default port from 1433. ☐
6. Enable remote DAC connections. ☐
7. Enable as required xp_cmdshell, SQLCLR, and OLE Automation for the SQL Server Instance. ☐
    1. Configure xp_cmdshell proxy account as required. ☐
8. Enable DatabaseMail and configure default public and private accounts. ☐
9. Configure SQL Error Log retention for 30 log files ☐
10. Configure SQL Agent job to perform nightly log rollover. ☐
11. Configure SQL Agent jobs for database backups, CHECKDB, index maintenance, statistics updates, backup cleanup, and history cleanup. ☐
12. Move MSDB Database files to the user database path. ☐
13. 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. ☐
14. Enable Trace Flag 1117, 1118, 2371, 2389, 2390, 3226. ☐
15. Set Model database to SIMPLE recovery, 100MB default datafile size and 100MB default logfile size. Set AutoGrowth to 100MB for data files and 100MB for Log file. ☐
16. 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). ☐

    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.
17. Set **max degree of parallelism** sp_configure option based on the number of physical CPU cores installed and anticipated workload ☐

    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.
18. Set **cost threshold of parallelism** sp_configure option based on the anticipated load. ☐

    General default value of 5 is low for most OLTP workloads and should be increased.

	Base value of 30-50 used for most server installs.	
19.	Add AD login (standard for environment and locked out in AD by default) for patching and emergency server access to Local Administrators Group.	☐
20.	Set SA user password to standardized password that is changed quarterly on all servers and maintained in password safe.	☐
21.	Configure Database Mail	☐
22.	Configure SQL Server Agent failsafe operator	☐
23.	Create Alerts for errors severity 16-25 and number 823, 824 and 825	☐
24.	Install all patches and updates for Windows	☐
25.	Install SQL Server Service Packs and CUs	☐
26.	Install the backup client	☐
27.	Backup all databases	☐
28.	Test restore	☐
29.	Run a test workload and test performance	☐

3. Objects to migrate

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

- ALERT ☐
- AUDIT ☐
- BACKUP DEVICE ☐
- CATEGORIES ☐
- CERTIFICATE ☐
- CLR ☐
- CONFIGURATION ☐
- CREDENTIAL ☐
- CRYPTOGRAPHIC PROVIDER ☐
- DATA COLLECTOR ☐
- DATABASE ☐
- DATABASE MAIL ☐
- DITRIBUTION DB ☐
- DTS PACKAGE ☐
- ENDPOINT ☐
- EVENT NOTIFICATION ☐
- JOB ☐
- LINKED SERVER ☐
- LOG SHIPPING ☐
- LOGIN ☐
- MAINTENANCE PLAN ☐
- MESSAGES ☐
- OPERATOR ☐
- PBM POLICY ☐
- PERMISSION ☐
- PROXIES ☐
- REGISTRY CONFIGURATION ☐
- REPLICATION ☐
- RESOURCE GOVERNOR ☐
- ROLE MEMBER ☐
- SCHEDULE ☐
- SERVER TRIGGER ☐
- SERVICE BROKER ☐
- SSIS PACKAGE ☐
- UCP ☐
- XE EVENT SESSION ☐
- XE SESSION ☐