Technical white paper

Standardize Microsoft SQL Server Cluster Provisioning Using HP DMA

HP Database and Middleware Automation version 10.30

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Purpose

This paper describes how to use HP Database and Middleware Automation (HP DMA) to create a repeatable, standardized "gold image" for provisioning Microsoft SQL Server, including the SQL Server clustered instance on multiple nodes and a SQL Server database on that clustered instance.

> **Tip:** To provision a SQL Server standalone environment, see *Standardize Microsoft SQL Server Standalone Provisioning Using HP DMA*, available at: softwaresupport.hp.com

Benefits of HP DMA

HP DMA automates many of the daily administrative tasks required to manage the lifecycle of relational databases and J2EE application servers. These tasks are complex, often manual, typically time-consuming, and frequently error-prone. HP DMA improves the efficiency of these administrative tasks, enabling administrators to deliver change faster with higher quality, better consistency, and improved reliability.

HP DMA equips you to do the following:

- Define and enforce standards for software installation
- Define an installation process once and reuse it repeatedly
- Leverage knowledge enterprise-wide
- Avoid human error

What SQL Server does

Microsoft SQL Server provides the following:

- Database management and system analysis for e-commerce, line-of-business, and data warehousing solutions.
- High availability and disaster recovery: Gain greater uptime, faster failover, improved manageability, and better use of hardware resources through failover clustering.
- Security and compliance: Help secure data with transparent data encryption, robust auditing, extensible key management and encrypted backups. It is even easier to manage permissions for data access to support separation of duties across various users.

Goal

This paper describes how to create the following configuration, a 2-node SQL Server clustered instance (named InstanceA) on both nodes:
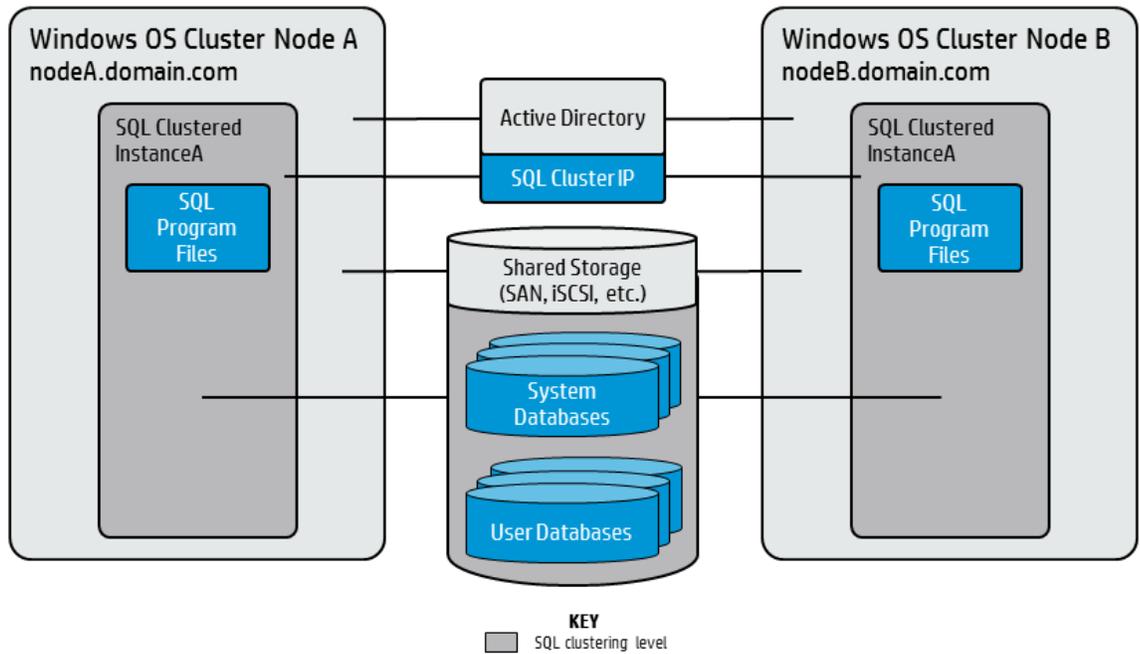
Prerequisites

Before performing the procedures in this paper, your environment must meet the following minimum requirements:

- An existing Windows 2008, 2008 R2, or 2012 cluster
- Installation software:
  - The SQL Server 2008, 2008 R2, or 2012 software installation files, obtained from Microsoft.
  - The installation media must be available locally or available for download from the software repository.[1]
- Storage:
  - An available shared disk for SQL Server shared files
  - A staging directory with 4 gigabytes available to unzip the SQL Server software
- Permissions to create an SQL Server database:
  - System Stored Procedures (SP)
  - CREATE LOGIN
  - If using a non-default database owner, the **sp_changedbowner** process is available
  - If a non-default database owner is specified and does not exist, permission to create the appropriate login
- .NET 3.5 is installed.

> **Note:** For additional information, see "Run as a Windows Domain User" in the *HP DMA Installation Guide*, available at: softwaresupport.hp.com

- Licenses for SQL Server and HP DMA.

For additional requirements, see the following Microsoft documentation:

SQL Server version	Microsoft documentation
2008	Hardware and Software Requirements for Installing SQL Server 2008
2008 R2	Hardware and Software Requirements for Installing SQL Server 2008 R2
2012	Hardware and Software Requirements for Installing SQL Server 2012

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[1]For additional information, see Alternative methods for specifying input files.

Process Overview

Use the following HP DMA workflows to standardize the process of provisioning a SQL Server clustered instance on multiple nodes and a SQL Server database on that clustered instance:

MS SQL - Install Clustered SQL Instance

Installs a new clustered instance of SQL Server on an existing Windows OS cluster.

MS SQL – Add Node to Cluster

Adds an additional node to an existing SQL Server clustered instance.

Run this workflow once for each additional node.

MS SQL Create Database

Creates a new SQL Server database on the target instance.

Only run this workflow once on any of the nodes.
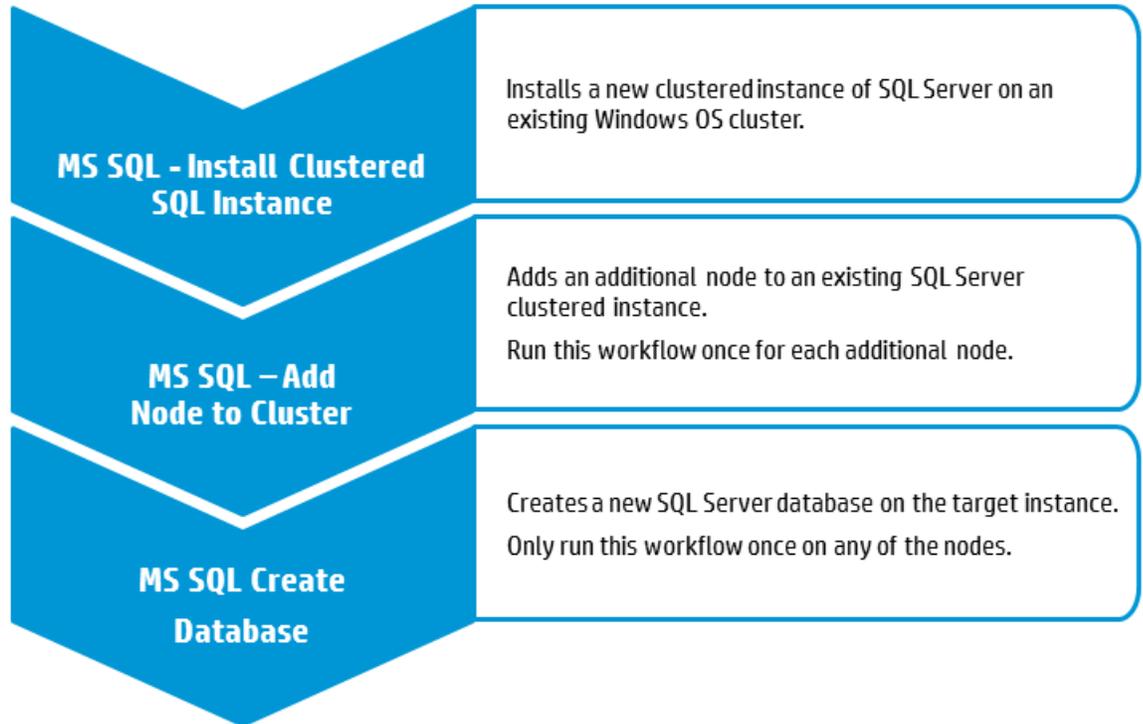
The following sections provide detailed information required to run each workflow.

Note: For additional information, see How to run an HP DMA workflow.

Workflow 1: MS SQL - Install Clustered SQL Instance

MS SQL - Install Clustered SQL Instance

MS SQL – Add Node to Cluster

MS SQL Create Database

This section provides detailed information required to run the MS SQL - Install Clustered SQL Instance workflow.

> **Tip:** To provision multiple SQL Server clustered instances on the same Windows OS cluster, run MS SQL - Install Clustered SQL Instance once for each.

Solution pack

This workflow requires the HP DMA Database Provisioning Solution Pack.

Parameters to expose

None

Input parameters

When you deploy the MS SQL - Install Clustered SQL Instance workflow, specify input parameter values for the following steps.

> **Note:** Bold text in the following tables indicates that you must specify a value for the parameter.

Step: Gather Parameters for DB2 Provision Instance

Parameter	Description	Example Value
Cluster Administrator Account	Required: The Windows domain user that will run the setup operation. This user requires elevated administrator privileges on the cluster. Format: <DOMAIN>\<USERNAME>	Win12\Administrator
Cluster Administrator Password	Required: Password for the Windows domain user that will run the setup operation. This user requires elevated administrator privileges on the cluster. Must be a strong Windows password.	●●●

Step: Gather Parameters for DB2 Provision Instance, continued

Parameter	Description	Example Value
Download From Software Directory	Optional: The name of the ZIP file that contains the SQL Server installation software files obtained from Microsoft.[1] Note: If necessary, manually zip the installation software files up.	`SQL12.zip`
Download Target Destination	Required: The local directory where the SQL Server setup files are stored:[2] - If source files are in the software repository: Location where Download From Software Directory will be downloaded and extracted - If source files are on the target: Location where the Microsoft SQL Server installation files already exist—not zipped up Upon a successful workflow completion, all downloaded and extracted files are cleaned up.	`C:\temp`
Instance Name	Required: The name of the newly created virtual server and instance. Format: <Virtual Server>\<Instance Name> Use MSSQLSERVER for the default instance and any other alphanumeric value for a named instance.	SQL-CLUSTER\InstanceA
Public IP Address	Required: Public IP Address. For SQL Server 2012 set to DHCP.	DHCP
Public IP Network Name	Required: IP Network Name for the clusters. Format: <Network Name>:<Subnet Mask> For example: Public:255.255.255.0	

[1]If the file is not found on the target server(s), it will be downloaded from the software repository. For additional information, see Alternative methods for specifying input files.
[2]For additional information, see Alternative methods for specifying input files.

Step: Gather Parameters for DB2 Provision Instance, continued

Parameter	Description	Example Value
SQL Agent Account	Required: The login account for the SQL Server Agent service. Can be a local Windows user, a domain user, or a built-in account (for example: NT AUTHORITY\NETWORK SERVICE). If not a built-in account, also specify SQL Agent Password. This parameter is optional for SQL Server 2008 or 2008 R2.	Win12\Administrator
SQL Agent Password	Required: Specify if SQL Agent Account is specified. This parameter is optional for SQL Server 2008 or 2008 R2.	●●●
SQL Service Account	Required: The login account for the SQL service. Can be a local Windows user, a domain user, or a built-in account (for example: NT AUTHORITY\NETWORK SERVICE). If not a built-in account, also specify SQL Service Password. This parameter is optional for SQL Server 2008 or 2008 R2.	Win12\Administrator
SQL Service Password	Required: Specify if SQL Service Account is specified. This parameter is optional for SQL Server 2008 or 2008 R2.	●●●
SQL Sysadmin Accounts	Required: A comma-delimited list of user accounts that will be set as system administrators. Each account must either be a local Windows user or a domain user. This parameter is optional for SQL Server 2008 or 2008 R2.	Win12\Administrator

Step: Discover SQL Databases

Parameter	Description	Example Value
Web Service Password	Required: Password for the HP DMA Discovery web service API.	●●●

Step: Discover SQL Databases, continued

Parameter	Description	Example Value
Web Service User	Required: User who is capable of modifying the managed environment by using the HP DMA Discovery web service API.	dmawebuser

Workflow 2: MS SQL - Add Node to Cluster

MS SQL - Install Clustered SQL Instance

MS SQL – Add Node to Cluster

MS SQL Create Database

This section provides detailed information required to run the MS SQL - Add Node to Cluster workflow.

Tip: To provision additional SQL Server nodes, run MS SQL - Add Node to Cluster once for each additional node.

Solution pack

This workflow requires the HP DMA Database Provisioning Solution Pack.

Parameters to expose

None

Input parameters

When you deploy the MS SQL - Add Node to Cluster workflow, specify input parameter values for the following steps.

Note: Bold text in the following tables indicates that you must specify a value for the parameter.

Step: MS SQL - Parameters - Add Node to Cluster

Parameter	Description	Example Value
Cluster Administrator Account	Required: The Windows domain user that will run the setup operation. This user requires elevated administrator privileges on the cluster. Format: <DOMAIN>\<USERNAME>	Win12\Administrator *Use the same value specified for Cluster Administrator Account in the MS SQL - Install Clustered SQL Instance deployment.*
Cluster Administrator Password	Required: Password for the Windows domain user that will run the setup operation. This user requires elevated administrator privileges on the cluster. Must be a strong Windows password.	●●● *Use the same value specified for Cluster Administrator Password in the MS SQL - Install Clustered SQL Instance deployment.*
Download From Software Directory	Optional: The name of the ZIP file that contains the SQL Server installation software files obtained from Microsoft.[1] **Note:** If necessary, manually zip the installation software files up.	SQL12.zip *Use the same value specified Download From Software Directory in the MS SQL - Install Clustered SQL Instance deployment.*

[1] If the file is not found on the target server(s), it will be downloaded from the software repository. For additional information, see Alternative methods for specifying input files.

Step: MS SQL - Parameters - Add Node to Cluster, continued

Parameter	Description	Example Value
Download Target Destination	Required: The local directory where the SQL Server setup files are stored:[1] - If source files are in the software repository: Location where Download From Software Directory will be downloaded and extracted - If source files are on the target: Location where the Microsoft SQL Server installation files already exist—not zipped up Upon a successful workflow completion, all downloaded and extracted files are cleaned up.	`C:\temp`
Instance Name	Required: The name of the newly created instance. Use MSSQLSERVER for the default instance and any other alphanumeric value for a named instance.	InstanceA *Use the <Instance Name> portion of the Instance Name parameter in the MS SQL - Install Clustered SQL Instance deployment.*

Step: Discover SQL Databases

Parameter	Description	Example Value
Web Service Password	Required: Password for the HP DMA Discovery web service API.	●●●
Web Service User	Required: User who is capable of modifying the managed environment by using the HP DMA Discovery web service API.	dmawebuser

[1]For additional information, see Alternative methods for specifying input files.

Workflow 3: MS SQL Create Database

This section provides detailed information required to run the MS SQL Create Database workflow.

MS SQL – Install Clustered SQL Instance

MS SQL – Add Node to Cluster

MS SQL Create Database

> **Tip:** You only need to run this workflow once per clustered instance. You can run it on any node.

Solution pack

This workflow requires the HP DMA Database Provisioning Solution Pack.

Parameters to expose

None

Input parameters

When you deploy the MS SQL Create Database workflow, specify input parameter values for the following step.

> **Note:** Bold text in the following table indicates that you must specify a value for the parameter.

Step: MS SQL Parameters Create Database

Parameter	Description	Example Value
Database Name	Required: Name of the new database.	NewDatabase
Web Service Password	Required: Password for the HP DMA Discovery web service API.	●●●
Web Service User	Required: User who is capable of modifying the managed environment by using the HP DMA Discovery web service API.	dmawebuser
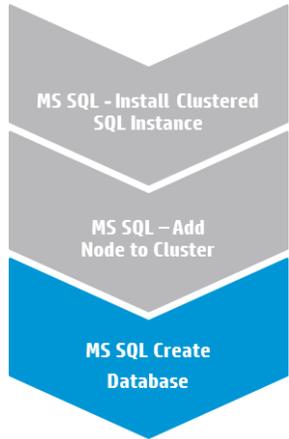
Appendix A: Alternative methods for specifying input files

HP DMA provides alternative methods for specifying input files, either downloaded from the software repository or stored directly on the target server(s).

Method 1: The input files are in the software repository

1. Obtain the pertinent input files.

   For example, download the SQL Server installation software files from Microsoft and create a ZIP file with setup.exe at the root of the ZIP file.

2. Import the files into the software repository. For additional information, see How to import a file into the software repository.

3. When you create the workflow deployment, specify the filenames and/or directory names for the pertinent input parameters—the files should not exist on the target server(s).

4. When the deployment is executed, HP DMA determines that the input files do not exist on the target server(s) in the specified (or default) download location and then downloads them from the software repository. If the input files need to be processed (for example, unzipped), the new files are placed in the specified (or default) extract location.

5. All downloaded, extracted, and staged files are removed upon successful completion of the workflow.

Method 2: The input files are stored on each target server

1. Obtain the pertinent input files.

   For example, download the SQL Server installation software files from Microsoft.

2. Copy the files to each target server into the specified (or default) download location.

3. When you create the workflow deployment, specify the filenames and/or directory names for the pertinent input parameters.

4. When the deployment is executed, HP DMA determines that the input files exist on the target server(s) in the specified (or default) download location. If the input file needs to be processed (for example, unzipped), the new files are placed in the specified (or default) extract location.

5. All extracted and staged files (and any downloaded files) are removed upon successful completion of the workflow.

Appendix B: How to import a file into the software repository

Many HP DMA workflows are capable of downloading files from the software repository on the HP DMA server to the target server(s) where the workflow is running. The following procedure shows how to import a file into the software repository so that it can be downloaded and deployed by a workflow.

HP DMA uses the HP Server Automation (SA) Software Library as its software repository.

> **Tip:** Be sure to use unique file names for all files that you import into the software repository.

To import a file into the SA Software Library:

1. Launch the SA Client from the Windows Start Menu.

   By default, the SA Client is located in Start → All Programs → HP Software → HP Server Automation Client.

   If the SA Client is not installed locally, follow the instructions under "Download and Install the HP SA Client Launcher" in the *HP Server Automation Single-Host Installation Guide* available at: softwaresupport.hp.com

2. In the navigation pane in the SA Client, select Library → By Folder. Select (or create) the folder where you want to store the file. Click **Import Software**.

3. In the Import Software dialog, browse to the file (or files) to import, select the character encoding, and then click **Open**. For the Type, select **Unknown**. Select (or browse to) the folder where you want to store the files. For the Platform, select all the operating systems. Click **Import**.

4. Click **Close** after the import completes.

Appendix C: How to run an HP DMA workflow

The following steps outline the general instructions to run an HP DMA workflow:

1. Import the specified HP DMA solution pack (if it is not already available).

2. Create a deployable copy of the workflow: Specify a name, add roles, optionally expose parameters (for additional information, see How to expose hidden parameters), and then **Save**.

3. Create a deployment: Specify a name, schedule, targets, and input parameters, and then **Save**.

4. Execute the deployment to run the workflow.

5. View the results to verify that the workflow ran correctly (refer to the online workflow documentation).

Note: For more information about running HP DMA workflows, see the *HP DMA Quick Start Tutorial* available at: softwaresupport.hp.com

Appendix D: How to expose hidden parameters

If you need to expose any hidden parameters, perform the following additional steps when you create a deployable copy of the workflow:

1. Click the Workflow tab.

2. Click the blue arrow ▶ next to the pertinent step to expand the list of input parameters.

3. For the parameter that you want to expose, select **– User selected –** from the drop-down list. For example:

4. Repeat steps 2 and 3 for all the parameters that you would like to expose.

5. Save the copy of the workflow.

To learn more about HP Database and Middleware Automation visit

[hp.com/go/dma](hp.com/go/dma)