Service Template for SharePoint® 2013 Enterprise Three Tier

Quick Start Guide

Version 1.1

Published: April 2013

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Windows Server & System Center

Customer | Architecture | Technology

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# Overview

This quick start guide for the service template for SharePoint 2013 Enterprise Three Tier Architecture provides reference guidance that you can use to automate the deployment of a Microsoft® SharePoint® Server 2013 Enterprise edition three tier service in a private cloud environment. For a matrix showing the differences between SharePoint versions, see [SharePoint feature availability across on-premise solutions](http://technet.microsoft.com/en-us/library/jj819267.aspx#bkmk_FeaturesOnPremise). The guidance in this document is designed to help you harness the power of service templates, which are an integral part of Microsoft System Center 2012 – Virtual Machine Manager (VMM), to deploy services in your environment. You can use service templates to automate tasks, and reduce deployment time and cost by dynamically provisioning services.

This short guide assumes that the IT pro using this documentation has experience working with VMM, specifically using VMM to deploy services using service templates. To learn more about VMM and service templates, see the following resources:

* [System Center 2012 Virtual Machine Manager](http://go.microsoft.com/fwlink/?LinkId=267307)
* [Using Service Templates in System Center Virtual Machine Manager 2012](http://go.microsoft.com/fwlink/?LinkId=268389).

# Environment Requirements

This service template is designed to work with System Center 2012 Service Pack 1 (SP1) on a virtual network with the operating system and application versions specified in the following table.

Table 1. Service Template Environment Requirements

| **Specification** | **Supported version** |
| --- | --- |
| System Center | System Center 2012 SP1 |
| Operating systems | Target virtual machine operating system: Windows Server® 2012 Datacenter. |
| Hyper-V® Host operating system: Windows Server 2012 with Hyper-V. |
| Network | A virtual network that is available during the import process of this template and has access to network resources mapped out in the remainder of this guide |
| SQL version | SQL Server® 2012 SP1 Enterprise x64 |
| SharePoint version | SharePoint Server 2013 Enterprise edition |

# Process Steps for Service Template Configuration

The following diagram depicts the overall high-level process flow of staging, preparing, and finally executing this service template for SharePoint Server 2013.



Figure 1. Service template configuration process

# Service Template for SharePoint 2013 Enterprise Three Tier Architecture

The following figure shows the architecture details of the service template for SharePoint 2013 Enterprise Three Tier configuration.



Figure 2. Service Template for SharePoint 2013 Enterprise Three Tier architecture

## Prepare Your Environment

This service template is based on a three tier model that is included in System Center 2012 SP1 – Virtual Machine Manager (VMM). The service template model helps IT administrators to automate deployment of SharePoint Server 2013 Enterprise on Windows Server 2012 in a three tier configuration. You also can easily extend the service template to automate more advanced deployment scenarios if required in your environment. This section focuses on how to prepare your environment to use this service template.

### Step 0: Download the Service Template Content

The service template and related files accompany this document and can be found on the TechNet Gallery page at the following location: [Virtual Machine Manager Service Template Example for SharePoint 2013](http://gallery.technet.microsoft.com/Virtual-Machine-Manager-77dea9d4).

The content of this download will be referenced throughout the document so ensure it is stored in a location for easy access to the artifacts within.

### Step 1: Create User Accounts for SharePoint

The service template for SharePoint 2013 Enterprise Three Tier can potentially take advantage of up to 11 unique service accounts for the installation of SharePoint. These are defined in the provided AutoSPinstaller .xml example file that the AutoSPInstaller script uses. For details on service account requirements, see [Plan for administrative and service accounts in SharePoint 2013](http://technet.microsoft.com/en-us/library/cc263445(v=office.15)).

This service template package leverages the following user accounts.

* !installer: The SQL Run As installation account used to deploy SQL. Must be a local administrator on the SQL tier.
* !SP\_CacheSuperReader: The SharePoint cache read only account.
* !SP\_CacheSuperUser: The SharePoint cache super user account.
* **!**SP\_Farm: The Server farm account (the installation account that the service template deployment of installing SharePoint uses).
* !SP\_PortalAppPool: The SharePoint portal account.
* !SP\_ProfilesAppPool: The SharePoint user profile management account.
* !SP\_SearchService: the SharePoint search service account.
* !SP\_Services: The default service account that most application pools use. By default, only search uses a separate managed account.
* !SP\_ExcelUser: The service account used for Microsoft Excel® Services.
* !SP\_VisioUser: The service account used for Microsoft Visio® Services.
* !SP\_SearchContent: The service account leveraged for search content services

Note    If you decide to modify any of the above accounts names, you must update the AutoSPinstaller.XML file provided as well as the SharePoint Farm administrator account referenced in the tier configuration section of the Import service template section. This file is referenced in **Table 2.** [**Step 2: Create the Network Share for the Service Template**](#_Step_2:_Create_1)under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**. SharePoint Farm account configuration is referenced in the **Import the Service Template** section under the **Run As Accounts** subsection of each tier.

Additional Note   Currently, the **SharePoint Farm Administrator** account (defined above) is used as the installation account for SharePoint within the service template due to an elevation issue that is encountered during deployment. If you use an alternate account for the installation of SharePoint, the search service may fail to deploy, and the service template may fail to properly deploy.

#### User Creation Script Provided in Downloadable Content

A simple PowerShell script has been provided within the downloadable content in a zip (**sp\_Create\_User.zip)** that could be used to create the service accounts used by SharePoint into the appropriate OU within your environment. This script assumes the ActiveDirectory PowerShell module is present and importable on the system it is running from. To leverage this script:

1. Extract the contents of sp\_Create\_User.zip that was made available in the source you downloaded to a script directory on a system (example: c:\scripts\sp\_Create\_User)
   1. Make sure the account you are logged in with that is executing this script has rights to create users in the target OU and that this OU will be available to the SharePoint farm you are deploying with this service template.
   2. Make sure the machine where this script is executing from has the ActiveDirectory PowerShell module
2. From an administrator elevated PowerShell console window execute the script with the following parameters   
     
   (Example shown with defaults provided – please supply proper OU and alternate input file if required)

.\sp\_Create\_User.ps1 -InputFile ".\sp\_user\_accounts.txt" -OUPath "ou=services,ou=HQ,dc=contoso,dc=com"

1. The results should be the following accounts created in the target OU (unless the account list has been modified or an alternate input file was leveraged).

|  |
| --- |
| !SP\_CacheSuperReader  !SP\_CacheSuperUser  !SP\_Farm  !SP\_PortalAppPool  !SP\_ProfilesAppPool  !SP\_SearchService  !SP\_Services  !SP\_ExcelUser  !SP\_VisioUser  !SP\_SearchContent  !installer |

Note    The UserIDs and associated passwords created should be updated within the main AutoSPInstaller XML file used for the installation of SharePoint. This file is referenced in **Table 2.** [**Step 2: Create the Network Share for the Service Template**](#_Create_the_Shares)under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**.

### Step 2: Create the Network Share for the Service Template

During the deployment of this service template, configuration steps (that happen during deployment) require a share on the network for source files to complete the installation of SQL Server 2012 SP1 Enterprise x64 and SharePoint Server 2013 Enterprise edition. In addition, the Windows PowerShell™ script AutoSPInstaller that you use to perform the actual installation and configuration of SharePoint needs to be located on the same network share with your source files for SharePoint Server 2013 Enterprise.

To Create the Network Share**:**

1. Ensure the account you are logged on with has rights to create shares and from a system that has network access to the file server you’ll be placing the source files on. Launch computer management (start/run **compmgmt**.**msc**)
2. Once the console is up, right click on **Computer** **Management** at the top and select **Connect** **to** **another** **computer**
3. Type the remote server in the **Another Computer** field
4. Navigate to **Shared Folders** under **System Tools** and expand the node
5. Right click on **Shares** and select **New** **Share**
6. Type in the path to your remote server system example: [\\SERVER\F$](file:///\\SERVER\F$) and then click **Browse**
7. Click **Make New Folder** and call it **APPS$** ensuring you are creating this in the proper location, in our example under [\\SERVER\F$\APPS$](file:///\\SERVER\F$\APPS$)
8. Provide read-only rights to the SQL installation account and SharePoint Farm installation account   
     
   Note    You may have to revisit this step after creating the proper accounts. The service template is configured to use contoso\!sp\_farm as the SharePoint Farm installation account and contoso\!installer as the SQL Run As installation account.

We recommend locating the AutoSPInstaller configuration XML and supporting files on a secure network share (not in the VMM Library) to ensure that the account credentials embedded within the unencrypted file remain as secure as possible, and are only accessible by those who require access to them.

Note   This share must be accessible via Universal Naming Convention (UNC) by the SQL installation Run As account and your SharePoint Farm administrator account, this is the account that is used to deploy the service template configuration. If you change the SQL installation account or opt to install SharePoint with a single account (for example) please ensure this account has been defined with sufficient rights to the above share to ensure a successful deployment leveraging this solution.

This service template for SharePoint Server 2013 has a dependent network share structure for deployment and configuration tasks that the service template takes advantage of for hydration. The recommended shares and directory structures are specified in the following table, and the supporting guidance assumes this directory structure. Replace [\\server](file:///\\server) with the server name and share you leveraged in the previous step in this section.

Table 2. Source Files and Shares

| **Component** | **Directory and description** |
| --- | --- |
| Main share | This is the main root source directory for the source files that the service template for SharePoint 2013 Enterprise Three Tier deployment process uses:  [\\server\apps$](file:///\\server\apps$) |
| SQL Server 2012 SP1 | This is the directory location for the SQL source files used for the final configuration of the SQL post deployment process:  [\\server\apps$\SQL2012SP1](file:///\\server\apps$\SQL2012SP1)  Note   Setup.exe for the SQL Server installation is assumed to be in the root of this folder. |
| AutoSPInstaller Extracted Source from CodePlex | This is the directory location for the extracted source files referenced by the service template for SharePoint 2013 Enterprise Three Tier during deployment. This directory should be extracted to ensure that the folder structure is maintained:  [\\server\apps$\AutoSPInstaller-3Tier-Enterprise](file:///\\server\apps$\AutoSPInstaller-3Tier-Enterprise) |
| SharePoint 2013 Source Files | This is the directory location for the extracted source files for SharePoint Server 2013 Enterprise install media:  [\\server\apps$\AutoSPInstaller-3Tier-Enterprise\SP\2013\SharePoint](file:///\\server\apps$\AutoSPInstaller-3Tier-Enterprise\SP\2013\SharePoint) |
| AutoSPInstaller Primary Script Folder | This is the primary script folder location for AutoSPInstaller.  [\\server\apps$\AutoSPInstaller-3Tier-Enterprise\SP\autospinstaller](file:///\\server\apps$\AutoSPInstaller-3Tier-Enterprise\SP\autospinstaller) |
| SharePoint 2013 AutoSPInstaller XML Configuration File | This is the directory location of the configuration file provided in the download for the service template for SharePoint 2013 Enterprise Three Tier. This file is referenced during the installation of SharePoint to automate the process using the AutoSPInstaller script. This file is located in the **downloaded** subfolder in the download. This content can be copied directly (maintaining folder structure) from the downloaded content to this location on your server share:  [\\server\apps$\AutoSPInstaller-3Tier-Enterprise\SP\autospinstaller\SharePointEnterprise2013Farm-3-tier.xml](file:///\\server\apps$\AutoSPInstaller-3Tier-Enterprise\SP\autospinstaller\SharePointEnterprise2013Farm-3-tier.xml) |

Note   SQL Server 2012 does **not** need to be located in the same share as the AutoSPInstaller files. However, SharePoint source files **are** assumed to be located in a subdirectory in the AutoSPInstaller share location.

Additional Note   SQL Server 2012 source files can be placed on the SysPrepped SQL tier image if desired (instead of located on the network). This process will also eliminate the requirement of a SQL Run As installation account (if the Run As account is left blank, the service template will leverage the SYSTEM context for the installation of SQL). For more information, see the [Install SQL Server 2012 SP1](#_Install_SQL_Server) section to determine when to place media on the SQL source VHDx. See Table 4 [Import the Service Template](#_Import_the_Service_1) for specific customizations required for your SQL tier in regards to a SQL Run As installation account under the subsection SQL Server Configuration\SQL Server Deployment\Installation Run As Account.

### Step 3: Download and Stage AutoSPInstaller

The service template for SharePoint 2013 Enterprise takes advantage of a robust scripted solution for the installation of SharePoint. This community script is located on CodePlex at [AutoSPInstaller](http://autospinstaller.codeplex.com/), and it must be downloaded and placed on a secure network share.

To download and stage AutoSPInstaller

1. Download the AutoSPInstaller configuration script from [AutoSPInstaller on the CodePlex website](http://autospinstaller.codeplex.com/).
2. Extract the downloaded contents to your secure network share that will be accessible by the account used to deploy the service template. See Table 2 [Step 2: Create the Network Share for the Service Template](#_Create_the_Shares) for the recommended share and folder structure.

### Step 4: Download and Stage SharePoint Server 2013

The SharePoint Server 2013 Enterprise source files are called directly by the AutoSPInstaller script to install SharePoint.

To download and stage SharePoint Server 2013 Enterprise

1. Download SharePoint Server 2013 Enterprise edition from the following location [Download Microsoft SharePoint Server 2013](http://technet.microsoft.com/en-US/evalcenter/hh973397.aspx?wt.mc_id=TEC_121_1_33).
2. Extract the source files for SharePoint Server 2013 and place them in a subfolder at the same level as the AutoSPInstaller script on your secure network share. See Table 2, "Source Files and Shares" in the section [Step 2: Create the Network Share for the Service Template](#_Create_the_Shares) for the recommended share and folder structure.

### Step 5: Download and Stage SQL Server 2012 SP1

SQL Server 2012 SP1 media is accessed during the service template customization of SQL. This media must be located on a share that is accessible by the service template execution account.

To download and stage SQL Server 2012 SP1

1. On the download page for [Microsoft SQL Server 2012 Service Pack 1 (SP1)](http://www.microsoft.com/en-us/download/details.aspx?id=35575), in the list under **Files in this download**, select the download link for **SQLServer2012SP1-FullSlipstream-ENU-x64.iso**.
2. Extract the source files for SQL Server 2012 SP1 slipstreamed and place them on your network share ([\\server\f$\apps$\SQL2012SP1](file:///\\server\f$\apps$\SQL2012SP1)) available to the account that will be leveraged for the installation of SQL. See the section titled [Step 2: Create the Network Share for the Service Template](#_Create_the_Shares) for account access and see Table 2, "Source Files and Shares" for the recommended share and folder structure.

### Step 6: Prepare the VHD for the Service Template (SQL Tier)

Use the following information to complete this step.

#### Prepare the Base VHD

To prepare the base virtual hard disk (VHD)

* **Install the operating system**: Create a base VHD using one of the supported operating systems specified in the [Environment Requirements](#_Environment_Requirements) section. For more information about how to create a virtual machine on a blank VHD, see [How to Create and Deploy a Virtual Machine from a Blank VHD](http://go.microsoft.com/fwlink/?LinkId=267310).

Note   Do not use SysPrep on the operating system at this point. The SysPrep requirement is detailed later in this section.

#### Install SQL Server 2012 SP1

Use the following information to install SQL Server 2012 SP1 onto your base VHD image you just created.

* **Install SQL Server 2012 on Base VHD:** To do so, see [Install SQL Server 2012 Using SysPrep](http://technet.microsoft.com/en-us/library/ee210664.aspx). Follow the instructions under the [Prepare Image](http://technet.microsoft.com/en-us/library/ee210664.aspx#prepare) section.

Note   Do not use SysPrep on the operating system at this point. The SysPrep requirement is detailed later in this section.

#### Finalize the VHD and Copy It to the Virtual Machine Library

Use SysPrep to finalize the VHD, and then copy it to the library so that it can be used by the service template for SharePoint 2013 Enterprise Three Tier.

To use SysPrep to finalize the VHD

1. Ensure that you have completed all of the previous substeps in this section.
2. Access SysPrep in the following directory on your virtual machine: %windir%\system32\SysPrep, and then at an elevated command prompt, execute the following example command.

Example: C:\windows\system32\SysPrep\SysPrep.exe /oobe /generalize /shutdown

1. After the virtual machine fully shuts down, navigate to the location of your VHD on your Hyper-V host, and then copy the VHD to the subdirectory where you store your virtual machine templates in your VMM library.

Example: [\\SCVMMServer\MSSCVMMLibrary\VHDs\](file:///\\SCVMMServer\MSSCVMMLibrary\VHDs\)

### Step 7: Prepare the VHD for the Service Template (APP / WFE Tiers)

Use the following information to complete this step.

#### Prepare the Base VHD

To prepare the base virtual hard disk (VHD):

* **Install the operating system**: Create a base VHD using one of the supported operating systems specified in the [Environment Requirements](#_Environment_Requirements) section. For more information about how to create a virtual machine on a blank VHD, see [How to Create and Deploy a Virtual Machine from a Blank VHD](http://go.microsoft.com/fwlink/?LinkId=267310).

Note   Do not use SysPrep on the operating system at this point. The SysPrep requirement is detailed later in this section.

#### Install SharePoint Server 2013 Enterprise

Use the following resources to install SharePoint Server 2013 (use the base install with no configuration):

* [Overview of SharePoint 2013 installation and configuration](http://technet.microsoft.com/en-us/library/ee667264.aspx).
* [Install SharePoint 2013 across multiple servers for a three-tier farm](http://technet.microsoft.com/en-us/library/ee805948.aspx).

To install SharePoint Server 2013 Enterprise

1. Run the prerequisite checker forSharePoint Server 2013 that is included with your source media to install and enable any server roles or download and apply any updates required for SharePoint.
2. Install SharePoint Server 2013 Enterprise on the virtual machine.

Note   Ensure to only install SharePoint and not configure it. Configuration happens during the service template deployment process using the AutoSPInstaller script and configuration XML.

#### Finalize the VHD and Copy it to the VMM Library

Use SysPrep to finalize the VHD, and then copy it to the library so that it can be used by the service template for SharePoint 2013 Enterprise Three Tier.

To use SysPrep to finalize the VHD

1. Ensure that you have completed all of the previous substeps in this section.
2. Access SysPrep in the following directory on your virtual machine: %windir%\system32\SysPrep, and then at an elevated command prompt, execute the following example command.

Example: C:\windows\system32\SysPrep\SysPrep.exe /oobe /generalize /shutdown

1. After the virtual machine fully shuts down, navigate to the location of your VHD on your Hyper-V host, and then copy the VHD to the subdirectory where you store your virtual machine templates in your VMM library.

Example: [\\SCVMMServer\MSSCVMMLibrary\VHDs\](file:///\\SCVMMServer\MSSCVMMLibrary\VHDs\)

### Step 8: Update the AutoSPInstaller XML for the Service Template

The service template for SharePoint 2013 Enterprise Three Tier comes with a preconfigured AutoSPInstaller.xml file (**SharePointEnterprise2013Farm-3-tier.xml**) that requires specific updates to be supported in your environment. This configuration file is provided as a working example for you to customize. This file is referenced in **Table 2.** [**Step 2: Create the Network Share for the Service Template**](#_Create_the_Shares)under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**.

#### Update Account Information

Use the following subsections to update your account information for the service template.

##### SharePoint Managed Accounts

It is necessary to update the account information in the **SharePointEnterprise2013Farm-3-tier.xml**. For details on service account requirements, see [Plan for administrative and service accounts in SharePoint 2013](http://technet.microsoft.com/en-us/library/cc263445(v=office.15)). Search for each specific account name, and update the account name and corresponding password within the XML to match your organizations account creation guidelines.

Note   Some passwords are surrounded by quotes and some are not. Ensure to follow the standards of the .xml file to ensure updating your passwords correctly. Search for the phrase EnterPassword to update.

#### Server Name Updates

The service template for SharePoint 2013 Enterprise Three Tier takes advantage of specific static server names. If you choose different server names for your deployment, you must update the server names in this file, as well as make appropriate updates are in the service template prior to deploying it. For more information, see the **OS Configuration** sections of **Table 4** and **Table 5** in the [Import the Service Template](#_Import_the_Service_1) section.

Note   Dynamic server names can be used in this service template for more advanced scenarios. A NLB and VIP is required to ensure that any URL referenced in the AutoSPInstaller .xml configuration file references a DNS name that can point to the deployed dynamically created server names. The addition of this extension to the service template allows for elasticity (expansion and potentially contraction) of the WFE tiers for scalability needs. For more information, see [Configuring Load Balancing in VMM Overview](http://technet.microsoft.com/en-us/library/jj721573.aspx). Dynamic server names are outside of the scope for the current release of this service template.

#### SharePoint Farm Passphrase Update

The SharePoint Farm passphrase is a passphrase used by SharePoint to allow resources to join an existing SharePoint environment. This passphrase is configured in the **SharePointEnterprise2013Farm-3-tier.xml** file and it is used during installation. We strongly recommend updating the passphrase from the default passphrase before deploying this service template. To update the passphrase, locate the **<*Passphrase*>** section of the AutoSPInstaller referenced .xml file, and then update it accordingly.

Note    This file is referenced in **Table 2.** [**Step 2: Create the Network Share for the Service Template**](#_Create_the_Shares)under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**.

#### SharePoint PIDKEY Update

The SharePoint Farm PIDKEY your license key for installation of the SharePoint farm. This PIDKEY is required to be entered before deployment of this service template. To update the PIDKEY for SharePoint, locate the **<PIDKey>XXXX-XXXX-XXXX-XXXX-XXXX</PIDKey>** section of the AutoSPInstaller referenced .xml file, and then update it accordingly.

Note    This file is referenced in **Table 2.** [**Step 2: Create the Network Share for the Service Template**](#_Create_the_Shares)under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**.

### Step 9: Copy EnablePSExec.CR to the VMM Library

Use the following information to copy the EnablePSExec script included in the download for the service template for SharePoint 2013 Enterprise Three Tier to the Virtual Machine Manager (VMM) library in System Center 2012.

To copy the script source to the library

1. Navigate to the directory where you downloaded the service template for SharePoint 2013 Enterprise Three Tier and extracted it.
2. In the **VMMLibrary\_Dependencies** subfolder, select the **EnablePSExec.CR** folder, and then copy it to the VMM library environment in System Center 2012:

Example: [\\SCVMMServer\MSSCVMMLibrary\scripts\EnablePSExec.Cr](file:///\\SCVMMServer\MSSCVMMLibrary\scripts\EnablePSExec.Cr)

Note   You may need to refresh the library to ensure that the script you added to it is available to you for the next section of guidance. The default refresh interval for the library is 1 hour.

### Step 10: Copy EnablePing.CR to the VMM Library

Use the following information to copy the Enable-PingResponse script included in the download for the service template for SharePoint 2013 Enterprise Three Tier to the VMM library in System Center 2012.

To copy the script source to the library

1. Navigate to the directory where you downloaded the service template for SharePoint 2013 Enterprise Three Tier and extracted it.
2. In the **VMMLibrary\_Dependencies** subfolder, select the **EnablePing.CR** folder, and then copy it to the VMM library environment in System Center 2012.

Example: [\\SCVMMServer\MSSCVMMLibrary\scripts\EnablePing.CR](file:///\\SCVMMServer\MSSCVMMLibrary\scripts\EnablePing.CR)

Note   You may need to refresh the library to ensure that the script you added to it is available to you for the next section of guidance. The default refresh interval for the library is 1 hour.

### Step 11: Copy EnableDatabaseFWException.cr to the VMM Library

Use the following information to copy the EnableDatabaseFirewallException.cmd script included in the download for the service template for SharePoint 2013 Enterprise Three Tier to the VMM library in System Center 2012.

To copy the script source to the library

1. Navigate to the directory where you downloaded the service template for SharePoint 2013 Enterprise Three Tier and extracted it.
2. In the **VMMLibrary\_Dependencies** subfolder, select the **EnableDatabaseFWException.cr** folder , and then copy it to the VMM library environment in System Center 2012

Example: [\\SCVMMServer\MSSCVMMLibrary\scripts\EnableDatabaseFWException.cr](file:///\\SCVMMServer\MSSCVMMLibrary\scripts\EnableDatabaseFWException.cr)

Note   You may need to refresh the library to ensure that the script you added to it is available to you for the next section of guidance. The default refresh interval for the library is 1 hour.

## Import the Service Template

This section provides instructions on how to import a service template into your Virtual Machine Manager library in System Center 2012 – Virtual Machine Manager (VMM).

To import the service template into the library in System Center 2012 VMM

1. In VMM, navigate to **Library**.
2. In the top of the left pane, in the **Templates** section, select **Service** **Templates**.
3. In the ribbon at the top, click **Import** **Template**.
4. Browse to where you extracted the source files for this service template, select the **SharePoint 2013 Enterprise Farm Three Tier.1.0.xml** file and follow the prompts to import it.

This service template uses the following virtual machine configuration parameters. Update the parameters to reflect the configuration of your environment as you import the service template.

Table 3. Virtual Machine Configuration Parameters

| **Resource type** | **Resource name and description** |
| --- | --- |
| **Library Resources** | **EnablePSExec.cr:** Map to the EnablePSExec.cr library resource in your VMM library. |
| **EnablePing.CR**: Map to the EnablePing.CR library resource in your VMM library. |
| **EnableDatabaseFWException.cr**: Map to the EnableDatabaseFWException.cr library resource in you VMM library. |
| **APP-WFE-SysPrep-SP2013.vhdx**: Select the base VHD image that you prepared earlier for the APP and WFE tier in this document in your VMM library. |
| **En-V-SQL12-SP1-P2.vhdx**: Select the base VHD image that you prepared earlier for the SQL tier in this document in your VMM library. |
| **Run As Accounts** | **Contoso\!installer**: Select a **Run as** account in your environment to be designated as the SQL Run As installation account for this SharePoint implementation. This account needs to be a local administrator on the SQL tier when the virtual machine is provisioned by VMM. See [Step 1: Create User Accounts for SharePoint](#_Step_1:_Create) in this document for more information. |
| **Contoso\!sp\_farm**: Select a **Run as** account in your environment to be designated as the SharePoint Farm Administrator account for this SharePoint implementation. See [Step 1: Create User Accounts for SharePoint](#_Step_1:_Create) in this document for more information.  **Note:** It will be necessary to create Run As accounts for the SharePoint Farm account and the SQL installation account if these accounts haven’t been previously defined within your VMM environment. This can be done at service template import time with the import package wizard and defining the accounts by clicking on **Create Run As Account** when mapping the previous account to the new account.  These accounts can also be created outside of the wizard by following the process documented here prior to import of the service template: [How to Create a Run As Account in VMM](http://technet.microsoft.com/en-us/library/gg675082.aspx) |
| **VM Networks** | **NT AUTHORITY\System**: Ensure proper mapping is in place to use NT AUTHORITY\System. This account is used for certain elevated script executions that are local to the system on each tier during the installation process. |
|  | **CorpNet01:** Map this to your virtual machine network that will provide access to the network infrastructure where your SharePoint farm is going to be installed. This interface will be used as the network to add your virtual machine(s) to the domain, communicate with your provisioned network share during deployment, as well as communication between each tier in this deployment. This VM Network selection is required to be consistently configured among all three tiers. |

Note   You will be required to complete post configuration steps in the Service Template Designer to ensure that the service can be properly deployed in the target environment. For more information about how to modify service templates after importing them, see, [How to Configure the Properties of a Service Template](http://go.microsoft.com/fwlink/?LinkId=267309).

The following tables includes recommended configuration updates that you will likely need to make to support the target environment.

Table 4. SQL Tier Target Environment Configuration Recommendations

| **Configuration item** | **Description** |
| --- | --- |
| **Hardware Configuration** | **Cloud Capability Profiles:** Select **Hyper-V**  **(Optional** – however if this is selected it must be configured consistently among all three tiers in your deployment**)**. |
| **Network Adapter:** Ensure that the appropriate virtual machine network in your environment is selected, and that appropriate configuration updates are applied to ensure network connectivity to the proper network during deployment of your service template. |
| **OS Configuration** | **Identity Information:** This tier requires a static server name and cannot be configured to be dynamic (See the **General** tab). If this server name is updated, you must also update the server references to it in the provided **SharePointEnterprise2013Farm-3-tier.xml** AutoSPInstaller configuration file.  Note    This file is referenced in **Table 2.** [**Step 2: Create the Network Share for the Service Template**](#_Create_the_Shares)under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**. |
| **Admin Password:** Define this password. We strongly recommend creating a password unless one is programmatically provided via Group Policy configuration. |
| **Product Key:** Enter the appropriate key or leave the field for it blank to enter the key after the operating system is provisioned. Evaluation mode is supported. |
| **Domain / Workgroup:** Provide appropriate configuration and credentials to join the environment to your domain. |
| **Application Configuration** | **Pre-install 1**: Ensure the **Run as** account for the EnableDatabaseFirewallException.cmd script is configured for NT AUTHORITY\System to ensure successful execution.  Note   This script adds a firewall exception for SQL to allow the farm resources to communicate to the SQL resources during installation. For more information, see [Configure the Windows Firewall to Allow SQL Server Access](http://technet.microsoft.com/en-us/library/cc646023.aspx). |
| **Pre-install 2**: Ensure the **Run as** account is set to NT AUTHORITY\System to allow for successful execution of this Internet Control Message Protocol (ICMP)-enabled script (Enable-PingResponse.ps1)  Note   This script modifies the firewall on each tier where it is executed to allow farm resources to reach each other through a ping. This update is necessary for certain components during the post configuration of SharePoint Server 2013. |
| **Pre-install 3**: Update the **Parameters** line to include the proper domain and SharePoint Farm administrator account to add to the local administrators group on the server running SQL Server 2012. See [Step 1: Create User Accounts for SharePoint](#_Step_1:_Create) in this document for more information  **Run As Account:** Ensure the **Run as** account is set to NT AUTHORITY\System to allow successful execution of this group modification command line. |
| **SQL Server Configuration\SQL Server Deployment** | **SQL Server Deployment (Name, Instance Name, Instance ID):** Update the details according to your configuration of the installation of SQL Server 2012 that you used SysPrep to prepare earlier in this guidance. The instance ID should match what was specified while using SysPrep. See [Install SQL Server 2012 SP1](#_Install_SQL_Server) in this document for more information.  **Product Key**: Provide the SQL Server 2012 product key for your organization.  **Installation Run as account:** This should be the SQL installation Run As account (**contoso\!installer** by default to be changed to match target environment) that you configured in see [Step 1: Create User Accounts for SharePoint](#_Step_1:_Create) in this document for more information. |
| **SQL Server Configuration\ Configuration** | **Media Source**: Update this path to match the location where the SQL Server 2012 SP1 source media is located that you staged during a previous step in this guide.  **SQL Server Administrators**: **Important**: Add the SharePoint Farm administrator account (default **contoso\!sp\_farm**) for this SharePoint deployment to the SQL Server administrators group to ensure that the database can be provisioned and updated during deployment. Remove the example **contoso\!sp\_farm** example, and then update it with the appropriate SharePoint Farm administrator account in your environment. For more information, see [Step 1: Create User Accounts for SharePoint](#_Step_1:_Create) in this document for more information. |
| **SQL Server Configuration\ Service Accounts** | **SQL Server Service Accounts**: This service template by default configures each SQL service to run under NT AUTHORITY\System. Review the information in the following resource to update Active Directory® service accounts to further harden your SQL Server 2012 installation: [Configure Windows Service Accounts and Permissions](http://msdn.microsoft.com/en-us/library/ms143504(v=sql.110).aspx). |

Table 5. APP and WFE Tier Target Environment Configuration Recommendations

| **Configuration item** | **Description** |
| --- | --- |
| **Hardware Configuration** | **Cloud Capability Profiles:** Select **Hyper-V**  **(Optional** – however if this is selected it must be configured consistently among all three tiers in your deployment**)**. |
| **Network Adapter:** Ensure that the appropriate virtual machine network in your environment is selected and appropriate configuration updates are applied to ensure network connectivity to the proper network during deployment. |
| **OS Configuration** | **Identity Information:** This service template is implemented with a static server name and is not configured to be dynamic (See the **General** tab). If this server name is updated, you must also update the server references to it in the provided **SharePointEnterprise2013Farm-3-tier.xml** AutoSPInstaller configuration file.  Note    This file is referenced in **Table 2.** [**Step 2: Create the Network Share for the Service Template**](#_Create_the_Shares)under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**.  **Additional Note**   If either the APP tier or the WFE tier is configured with a wildcard, such as WFE## (SERVER### will name virtual machines as SERVER001, SERVER002, and so on). Dynamic server names can be used in this service template for more advanced scenarios, however an NLB and VIP is required to ensure that any URL referenced in the AutoSPInstaller .xml configuration file references a DNS name that can point to the deployed dynamically created server names. The addition of this extension to the service template allows for elasticity (expansion and potentially contraction) of the WFE tiers for scalability needs as well. For more information, see [Configuring Load Balancing in VMM Overview](http://technet.microsoft.com/en-us/library/jj721573.aspx). Dynamic server names are out of scope for the current version of this service template. |
| **Admin Password:** Define this password. We strongly recommend creating a password unless one is programmatically provided via Group Policy configuration. |
| **Product Key:** Enter the appropriate key or leave the field for it blank to enter the key after the operating system is provisioned. Evaluation mode is supported. |
| **Domain / Workgroup:** Provide appropriate configuration and credentials to join the environment to your domain. |
| **Application Configuration** | **Pre-install 1**: Ensure the **Run as** account is enabled for both Windows PowerShell and UAC and that the combined script is configured for NT AUTHORITY\System to ensure successful execution.  Note   This script changes the default execution policy for Windows PowerShell x64 to **RemoteSigned**. This script also disables UAC for the system to ensure that all scripts can execute successfully in an automated mode without user interaction. |
| **Pre-install 2**: Ensure the **Run as** account is set to NT AUTHORITY\System to allow successful execution of this ICMP- enabled script (Enable-PingResponse.ps1).  **Note**   This script modifies the firewall on each tier where it is executed to allow farm resources to reach each other through a ping. This update is necessary for certain components during the post configuration of SharePoint Server 2013. |
| **Pre-install 3**: Update the **Parameters** line to include the proper domain and SharePoint Farm administrator account to be added to the local administrators group on the web and app tiers. This should be your SharePoint Farm administrator account (default **contoso\!sp\_farm**). For more information, see [Step 1: Create User Accounts for SharePoint](#_Step_1:_Create) in this document for more information.  **Run As Account:** Ensure the **Run as** account is set to NT AUTHORITY\System to allow successful execution of this group modification command line. |
| **Post-install 1:** Update the **Parameters** line to include the proper share path to your staged AutoSPInstaller directory and the corresponding Windows PowerShell script AutoSPInstallerMain.ps1, as well as the updated **SharePointEnterprise2013Farm-3-tier.xml** configuration file.  Note    This file is referenced in **Table 2.** [**Step 2: Create the Network Share for the Service Template**](#_Create_the_Shares)under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**.  **Additional Note**   Ensure that the command line is only modified to support paths in your environment. It might be helpful to copy the entire line to Notepad to update it and then re-insert the line into the parameters section.  **Run As Account:** Provide the **Run as** account for the Post-install 1 script that will be used to install the SharePoint 2013 Enterprise Three Tier farm. This should be your SharePoint Farm administrator account (default **contoso\!sp\_farm**). For more information, see [Step 1: Create User Accounts for SharePoint](#_Step_1:_Create) in this document for more information. |

# Troubleshooting

The following section provides some basic troubleshooting areas to review if issues arise during deployment. Logs can be very valuable in determining root cause.

## Job Status Logs within VMM

Job status logs are useful for monitoring the overall progress of a service template deployment (including some basic information on status of failures. Job status logs are located in the **Jobs** section within the VMM console found by navigating to the lower left and clicking on **Jobs**.

## Deployment Log Files

During the deployment of this service template, log files are created within the %windir%\temp folder of each tier within the deployment. The following logs will show up during the deployment of the service template as each tier executes scripts.

### %WINDIR%\TEMP\STDOUTPUT.TXT

This log file (will be represented on the web and app tiers during and after deployment) shows the status of the success of the deployment including current state of installation of SharePoint.

**Note**   In some cases, the AutoSPInstaller script will return a 0 code on failure. In this situation, troubleshooting information regarding that failure may show up inside this log showing the exact error at time of failure.

### %WINDIR%\TEMP\STDERROR.TXT

This log file (will be presented on the web and app tiers during and after deployment) shows the status of failures that may result from an error in installation, configuration of SharePoint.

## Potential Errors

### SQL Installation Rights

#### Issue

If you’ve specified an account for the installation of SQL that is not a local administrator on the SQL tier, you could receive the following error

|  |
| --- |
| Error (22042)  The service (SharePoint Farm) was not successfully deployed. Review the event log to determine the cause before you take corrective action.  Recommended Action  The deployment can be restarted by retrying the job.  Error (21909)  The script command exit code (1) matched the regular expression ([^0]) that is specified in the failure policy. Standard output log data: ""  Recommended Action  If the script command's job restart action is set to restart, then the script will be re-executed. Otherwise, the script command will be skipped when the job is restarted, in which case corrective action should be taken to mitigate the effects of the script command failure.  Error (20400)  1 parallel subtasks failed during execution.  Error (21952)  Application deployment failed for one or more tiers or application hosts in the service (New Sharepoint). Check job logs to get more information on the failed operation.  Recommended Action  Check error messages and retry the operation if needed. |

#### Potential Resolution

The SQL Installation account does not have administrator rights on the SQL tier. Please refer to Table 4 in the section titled [Import the Service Template](#_Import_the_Service_1) in the subsections of **SQL Server Configuration**\**SQL Server Deployment**\**Installation Run As Account** for more information on accounts and requirements.

### Web Front End Tier (OWSTimer Update Conflict)

#### Issue

You may receive the following error on a rare install on the web tier.

|  |
| --- |
| Error (22632)  The script command standard error matched the failure policy setting "Match any string" with its result ("Set-SPEnterpriseSearchService : An update conflict has occurred, and you must re-try this action. The object SearchService Name=OSearch15 was updated by CONTOSO\!sp\_farm, in the OWSTIMER (1628) process, on machine SPFEAPP1. View  the tracing log for more information about the conflict.  At \\fs02\apps$\AutoSPInstaller-3Tier-Enterprise\SP\autospinstaller\AutoSPInstallerFunctions.ps1:3407 char:41  + Get-SPEnterpriseSearchService | Set-SPEnterpriseSearchService `  + ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~  + CategoryInfo : InvalidData: (Microsoft.Offic...etSearchService: SetSearchService) [Set-SPEnterpriseSearchService], SPUpdatedConcurrencyException  + FullyQualifiedErrorId : Microsoft.Office.Server.Search.Cmdlet.SetSearchService").  For more information, see the standard error log (c:\windows\temp\stderror.txt).  Recommended Action  If the script command's job restart action is set to restart, then the script will be re-executed. Otherwise, the script command will be skipped when the job is restarted, in which case corrective action should be taken to mitigate the effects of the script command failure. |

#### Potential Resolution

This error can occur on rare occasions and is due to a timing issue during the installation of SharePoint with no automated workaround at this time. It is recommended to attempt a restart of the job (from the jobs tab within VMM). In some occurrences, the only resolution is to delete the service and redeploy.

### Service Template Deployed but SharePoint Does Not Come up

#### Issue

If accounts are not properly created and / or XML for AutoSPInstaller has not been updated to reflect created SharePoint service accounts you may successfully deploy the service template but fail to install SharePoint due to account issues. Example shown below.

-----------------------------------

| Automated SP2013 install script |

| Started on: 4/2/2013 9:42:03 PM |

-----------------------------------

- SharePoint 2013 binaries are already installed.

--------------------------------------------------------------

- Validating user accounts and passwords...

- Account "contoso\!sp\_farm"...Invalid!

- Account "contoso\!SP\_Services"...Invalid!

- Account "CONTOSO\!SP\_PortalAppPool"...Invalid!

- Account "CONTOSO\!SP\_ProfilesAppPool"...Invalid!

- Account "CONTOSO\!SP\_SearchService"...Invalid!

- Account "CONTOSO\!SP\_SearchService"...Invalid!

- Account "CONTOSO\!SP\_SearchContent"...Invalid!

- Account "CONTOSO\!SP\_SearchService"...Invalid!

- Account "CONTOSO\!SP\_ExcelUser"...Invalid!

- Account "CONTOSO\!SP\_VisioUser"...Invalid!

- Account "CONTOSO\!SP\_ExcelUser"...Invalid!

--------------------------------------------------------------

- Script halted!

- At least one set of credentials is invalid.

- Check usernames and passwords in each place they are used.

#### Potential Resolution

Refer to the section in this document on account creation for more information [Step 1: Create User Accounts for SharePoint](#_Step_1:_Create). Information on updating the AutoSPInstaller XML file can be found at [Step 2: Create the Network Share for the Service Template](#_Step_2:_Create_1) in Table 2 under the section titled **SharePoint 2013 AutoSPInstaller XML Configuration File**.

### Failure to Contact the SQL Tier During Service Template Deployment

#### Issue

If this service template is being deployed in an iterative fashion (multiple times for testing) DNS issues may result requiring stale entries to be purged to ensure name resolution is successful during deployment.

--------------------------------------------------------------

- Testing access to SQL server/instance/alias: SPFESQL

- Trying to connect to “SPFESQL” . . . - Fail

--------------------------------------------------------------

#### Potential Resolution

If tier communications come up during execution of the service template, validate DNS is clean for each server used and retry the service template deployment.

### Received Name *server* When *server.contoso.com* was Expected

#### Issue

Under certain conditions, you may receive an error within the VMM service template job status similar to the following during the deployment of your service template:

*“Failed: Received name XXXX when XXX.contoso.com was expected”*

#### Potential Resolution

Check to ensure that you have sufficient DHCP IP addresses available in the environment you are deploying your service template tiers to.

# Feedback

Please provide suggestions and comments about this quick start guide and the service template for SharePoint 2013 Enterprise Three Tier on the [Building Clouds Blog](http://aka.ms/BuildingClouds) under the introductory blog post for this solution [Application Management-Example-Deploying a Service to Your Private Cloud (Part 1)](http://blogs.technet.com/b/privatecloud/archive/2013/04/03/deployment-example-deploying-a-service-to-your-private-cloud-part-1.aspx).

# More Information

The following resources provide information about the concepts and techniques described in this guide:

* [AutoSPInstaller](http://autospinstaller.codeplex.com/)
* [Configure the Windows Firewall to Allow SQL Server Access](http://technet.microsoft.com/en-us/library/cc646023.aspx)
* [Configure Windows Service Accounts and Permissions](http://msdn.microsoft.com/en-us/library/ms143504(v=sql.110).aspx)
* [Configuring Load Balancing in VMM Overview](http://technet.microsoft.com/en-us/library/jj721573.aspx)
* [How to Create a Virtual Machine from a Blank VHD](http://go.microsoft.com/fwlink/?LinkId=267310)
* [How to Configure the Properties of a Service Template](http://go.microsoft.com/fwlink/?LinkId=267309)
* [SharePoint feature availability across on-premise solutions](http://technet.microsoft.com/en-us/library/jj819267.aspx#bkmk_FeaturesOnPremise)
* [System Center 2012 Virtual Machine Manager](http://go.microsoft.com/fwlink/?LinkId=267307)
* [Using Service Templates in System Center Virtual Machine Manager 2012](http://go.microsoft.com/fwlink/?LinkId=268389)
* [What is SysPrep?](http://go.microsoft.com/fwlink/?LinkId=267312)
* [Building Clouds Blog](http://aka.ms/BuildingClouds)