



# XenClient Enterprise Synchronizer Installation Guide

Version 5.1.0

March 26, 2014

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Version: 2.1  
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## About this Guide

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This document serves as a guide for the installation and configuration of XenClient Enterprise Synchronizer, the administrative half of the XenClient Enterprise solution. The instructions in this document describe how to install and prepare Synchronizer for use.

## Hardware, Software and Browser Requirements

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The host must be a stand-alone (physical) server or a virtualized machine.

Processor	Memory	Hard-drive	Networking
Intel Xeon Dual Core 2.0 GHz	6GB RAM (recommend 8GB)	200 GB 10K RPM	Single Port 1Gbps Ethernet NIC

The Synchronizer server must have the following operating system and supporting software installed before installation:

- **Windows Server 2008 R2, Windows Server 2012, or Windows Server 2012 R2**



Synchronizer cannot communicate with Hyper-V running on Windows Server 2012 if Synchronizer is installed on Server 2012 R2.

If you are installing Synchronizer in a VM running Windows Server 2012, the Hyper-V host must also be running Windows Server 2012; a 2012 R2 VM with Synchronizer installed must use a 2012 R2 installation as a Hyper-V host to ensure communication.

- **Microsoft Hyper-V (6.0.6002.18005 or higher)**

If Microsoft Hyper-V is not found, installation will halt and prompt you to install it. The required version is bundled with the operating system.



If you are installing Synchronizer into a VM (referred to as a virtual appliance), and the VM is using Windows Server 2012, Synchronizer must be configured to use Hyper-V 2012. Similarly, if Synchronizer is installed as a virtual appliance on a 2012 R2 installation, Synchronizer must be configured to use Hyper-V 2012 R2. Otherwise, Hyper-V 2008 that comes with Windows Server 2008 R2 can be used.

Once installed, access Synchronizer through a Web browser; Internet Explorer 9/10 Firefox and Chrome are supported.



The VM Console (used for authoring) only works with Internet Explorer; if the VM Console is used, Microsoft .NET Framework 4.0 must be installed.

## BIOS Settings

For Hyper-V to operate correctly, the server must have the following BIOS settings enabled:

**Virtualization:** enabled (checked)

**VT:** enabled (checked)

**Trusted Execution:** off (unchecked)

For Lenovo computers:

**Timer wake with battery:** enabled



You need to restart the computer for changes to the BIOS to take effect. On some systems, it may be necessary to power-down the computer for a few minutes, then restart.

## Adding Hyper-V to Windows Server

If Microsoft Hyper-V is not found, Synchronizer installation will stop and prompt you to install it. Use the Microsoft instructions to install (add the role of) Hyper-V to the server.

See the following reference pages for installing and enabling the Hyper-V role on Windows Server operating systems:

Operating System	Hyper-V Installation Reference Material
Windows Server 2008 R2	<a href="http://www.windowsreference.com/windows-server-2008/hyper-v-install-enable-on-windows-server-2008-64-bit/">http://www.windowsreference.com/windows-server-2008/hyper-v-install-enable-on-windows-server-2008-64-bit/</a>
Windows Server 2012 and 2012 R2	<a href="http://technet.microsoft.com/en-us/library/hh846766.aspx#BKMK_Step1">http://technet.microsoft.com/en-us/library/hh846766.aspx#BKMK_Step1</a>

Hyper V Prerequisites: <http://technet.microsoft.com/en-us/library/cc731898.aspx>

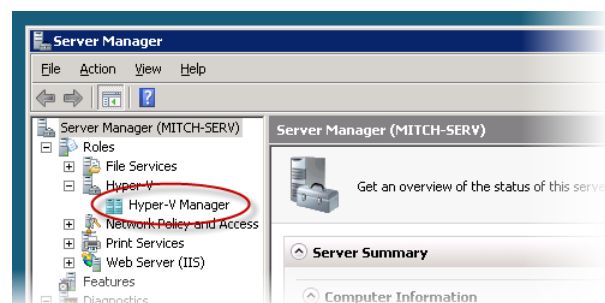
When you create a Virtual Network, select a physical network adapter as its connection, and name the virtual network **External Network**.



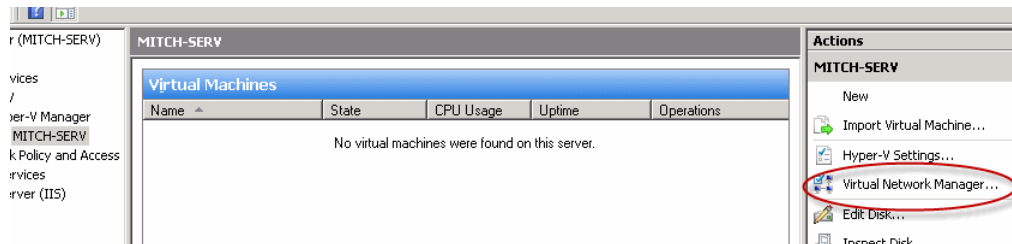
Hyper-V Installation will warn you if the required BIOS Settings are not enabled.

You can also add a Virtual Network after the initial installation of Hyper-V:

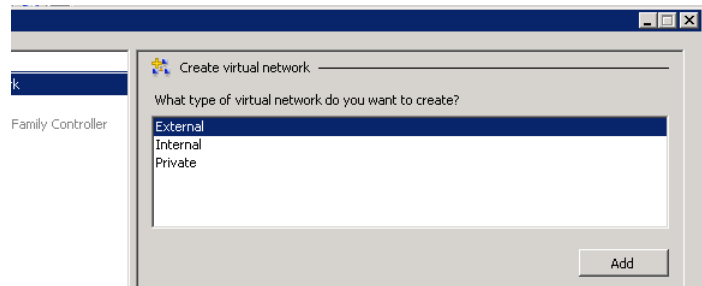
1. Open the Server Manager, and expand the Roles to show the **Hyper V Manager**, and select it.



2. On the right panel, select the Virtual Network Manager.

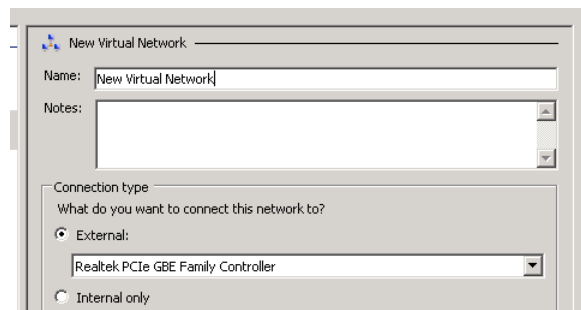


3. Select **External** as the type, and click the **Add** button.



4. Enter **External Network** as the name of the Virtual network. Select the (physical) controller to connect to, and click **OK**.

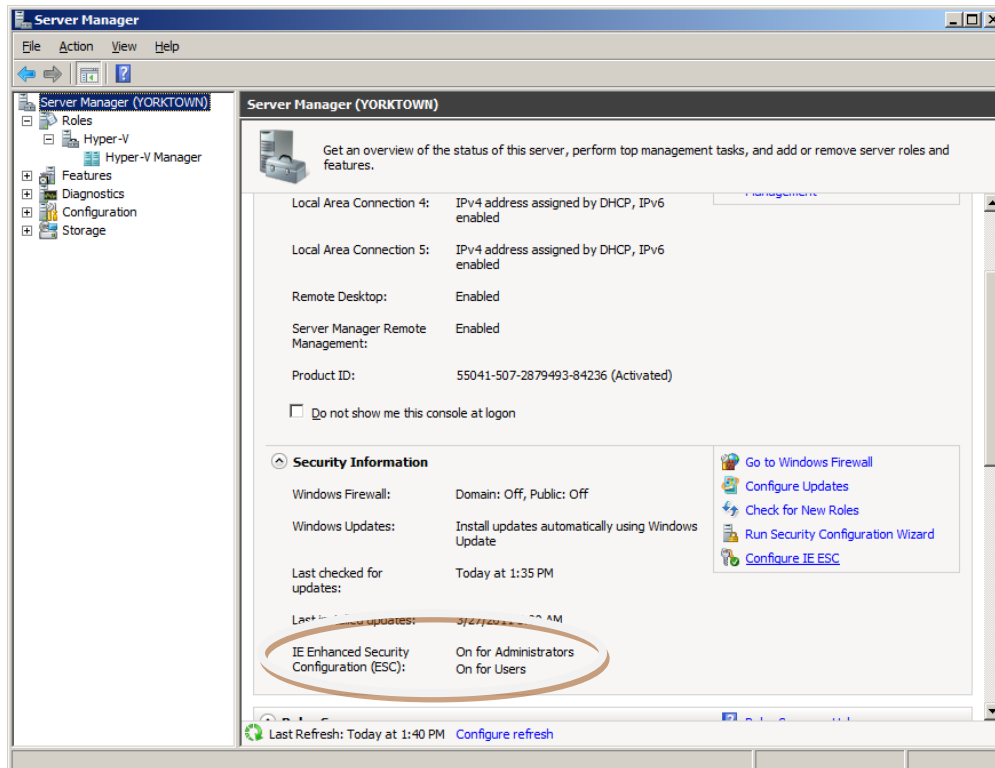
**Note:** The name **External Network** is a requirement.



5. When prompted, complete the Hyper-V installation by rebooting the server.

## Disable Enhanced Internet Explorer Security during Installation

Citrix recommends that you turn off Enhanced Internet Explorer Security during installation of Synchronizer. Turning this feature off prevents messages from being displayed during installation, which greatly slows the installation process.



Disable the “Enhanced Internet Explorer Security” Windows Component by clearing the checkbox:

1. In the Server Manager tree, expand the roles to display options associated with the Hyper-V Manager.
2. In the Server Manager window, select the Configure IE ESC link.
3. Find and clear the checkbox for “Enhanced Internet Explorer Security”.

When you start Internet Explorer, it warns you:

**Caution:** Internet Explorer Enhanced Security Configuration is not enabled.

After installation, enable Enhanced internet Security by following these same steps and filling the checkbox.

## Enable RDP ActiveX Control

If the computer running the browser used to connect to Synchronizer uses Windows XP, ensure that the RDP ActiveX control is enabled. Otherwise, it will not function properly. It is disabled by default.



Even if the browser is not running Windows XP, the RDP ActiveX control might still be set to Disabled. If you experience a "Cannot install RDP ActiveX control" message, the control may be disabled.

1. In the browser, click on **Tools > Manage Add-ons**.
2. In the dialog box, find **Microsoft RDP Client Control** and make sure that it is **Enabled** (Status column).
3. If you cannot find the RDP ActiveX control in the Manage Add-ons dialog, see <http://www.winhelponline.com/blog/error-remote-desktop-web-connection-activex-control-could-not-be-installed-after-installing-windows-xp-sp3/> to fix a known issue with this control on Windows XP. For convenience the information is provided below:
  - a. Click **Start> Run**.
  - b. Enter **Regedit.exe**.
  - c. Navigate to the following branch HKEY\_CURRENT\_USER\Software\Microsoft\Windows\CurrentVersion\Ext\Settings.
  - d. Double-click **Settings** to expand the branch.
  - e. Right-click **{7584c670-2274-4efb-b00b-d6aaba6d3850}** and choose **Delete**.
  - f. Click **Yes** when asked for confirmation.
4. If your browser does not have the RDP ActiveX Control, please use Windows Update to install it.

## Open Ports on firewalls

If you are installing on a server with a firewall, ensure that the following ports are available. If not, create a rule manually to open these ports. Synchronizer installer does not create a firewall rule to open the ports used by it.

The following table provides information the ports used by Synchronizer.

Port	Use
443	Used by XenClient Engines to communicate with Synchronizer. If the port is not open, clients cannot register or otherwise communicate with Synchronizer.
8443	Used by an Administrator to communicate with the Synchronizer UI.
2179	Used by Hyper-V Management Service Console (RDP)
1433	SQL database port; this port must be open on the server hosting the database (which may or may not be the Central Server). All servers (central and remote) need access to this port to open

	connections to the database server.
389	Non-SSL port for LDAP to AD
636	SSL port for LDAP to AD

## Removing Existing Applications

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The following applications or services must not be installed or have been previously running on the Windows 2008 64bit server:

- Apache Tomcat Server
- Microsoft SQL, MySQL or SQLEXPRESS Database Server/Services
- Java Runtime Environment (JRE)

If these are installed, the installation includes tools to remove them cleanly.



Back up any data within these applications that you want to preserve.

## Installing XenClient Enterprise Synchronizer

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The following section details the steps required to install Synchronizer on a physical server.

Synchronizer relies on a number of components to be installed to work successfully. As part of the installation process, the installer sets up the following applications:

- Apache Tomcat Server 7.0
- Microsoft SQL Server 2012 Express (unless using database on another server)
- Microsoft SQL Server Management Studio Express
- Java Runtime Environment (JRE) Version 7 Update 17

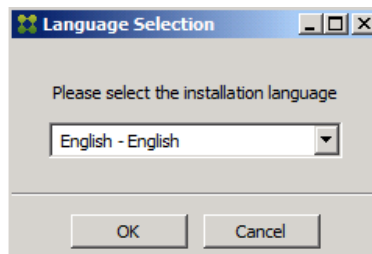


Synchronizer requires administrative privileges to install successfully onto the Windows Server operating system.

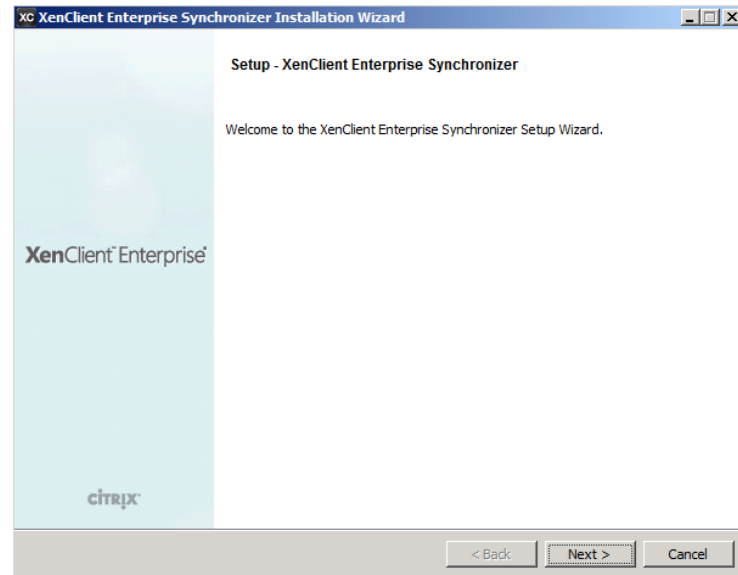
Start Synchronizer installation using the installation kit. The kit may be local on the server or available over your network.



1. Run the Installer. Select the Synchronizer installation language:

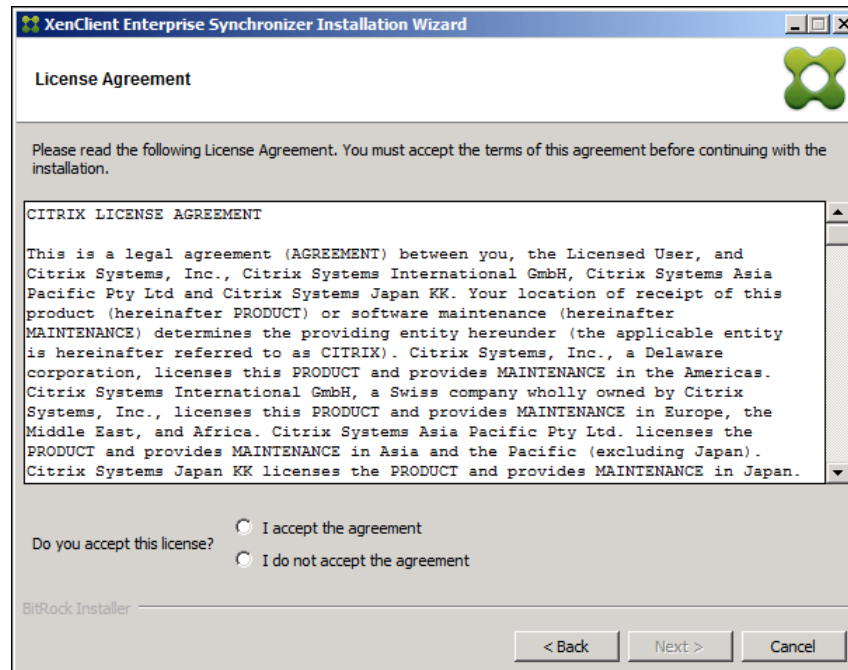


2. The Welcome screen appears:

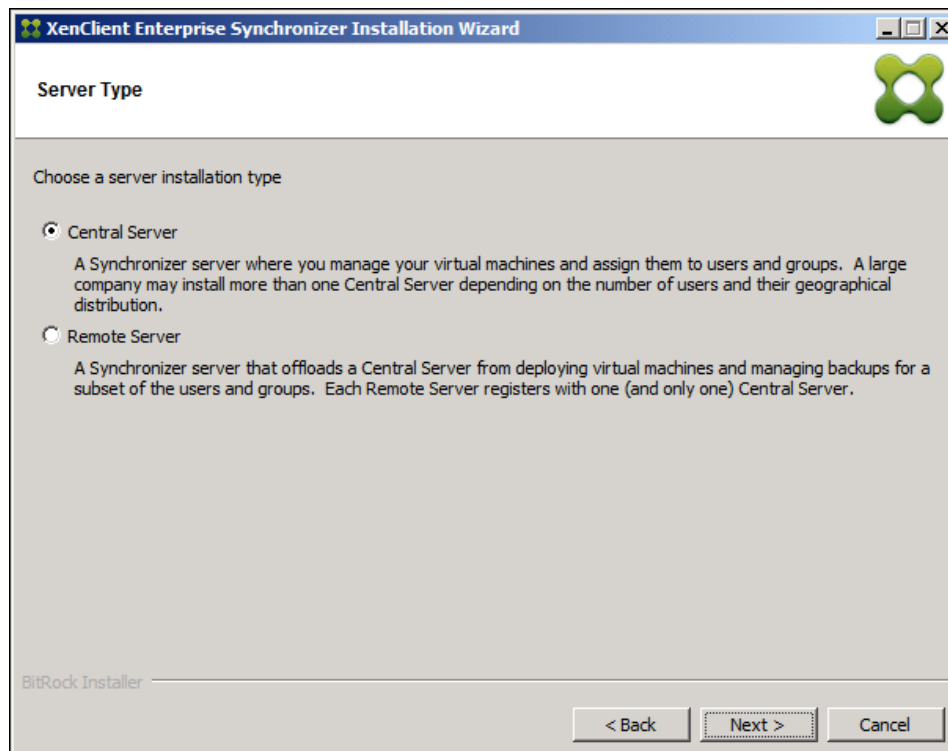


3. Click **Next** to continue.

The next screen shows the End User License Agreement for Synchronizer.



4. Please read thoroughly and only choose **I Accept the agreement** if you understand and agree with the license. Click **Next** to accept the agreement and continue the installation.
5. The Server Type screen appears. Select either the **Central Server** or **Remote Server** radio button. For Central Server installations, you manage your virtual machines and assign them to users and groups. For Remote Server types, the server offloads a Central Server from deploying virtual machines and managing backups for a subset of users and their groups.



In the event of a disk failure on a remote server, Citrix recommends that you backup the keystore file to facilitate recovery operations. This keystore file can be found here:

C:\Program Files\Apache Software Foundation\Tomcat 7.0\ssl\nxtpcenter\_virtualcomputer\_com.jks

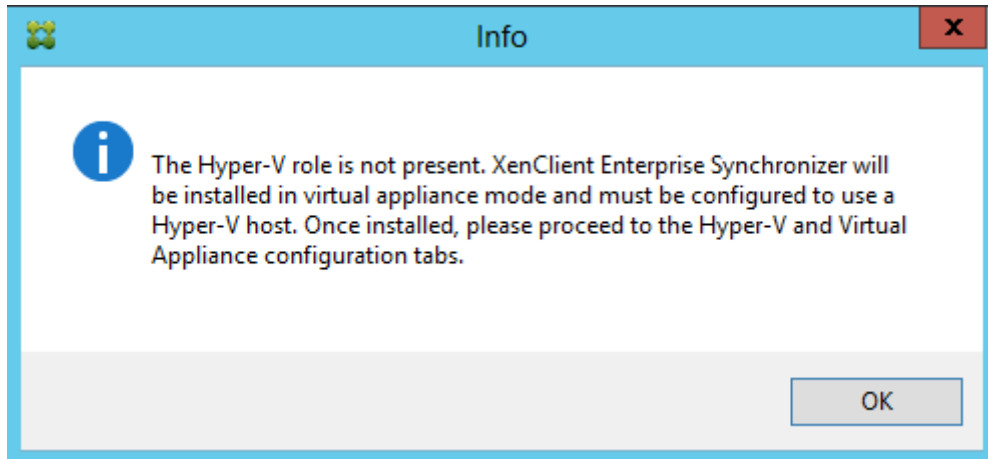



The remote server must be in the same domain as the central server.

6. The Server Information screen appears. Enter the **Server Name**, and the **Server Description** then click **Next**.



If Hyper-V is not detected during the installation process, a dialog appears indicating that Synchronizer will be installed as a virtual appliance; click OK to continue with the installation (the image below illustrates this message).



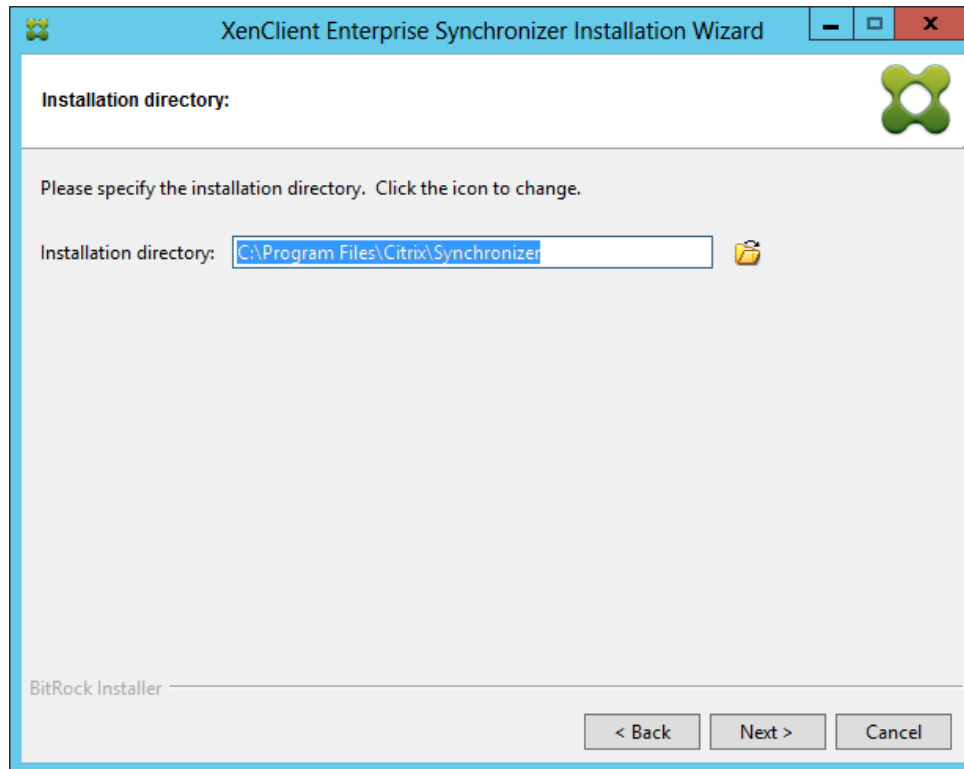
-  For a central server installation, provide the name of the server and the location of the database.

The "XenClient Enterprise Synchronizer Installation Wizard" window, titled "Server Information". It features a green logo in the top right. The main text reads: "Please enter the name that you want to use to refer to the server and a description. The name that you specify should be unique. It will be used to register the server in the database and to identify it in the Synchronizer UI." Below this are two input fields: "Server Name" and "Server Description". At the bottom, there are three buttons: "< Back", "Next >", and "Cancel". The "BitRock Installer" logo is in the bottom left corner.

7. The installer checks that the host is suitable:
- It checks the OS. If the host runs Windows Server without the Hyper-V role, the installer interprets this as installing into a virtual machine. It displays an information pop-up telling you that it will perform a virtual appliance installation.
- This pop-up does not appear if you are installing on a physical server and Hyper-V is configured.

- If the host runs Windows Server 2008 SP2 with a Hyper-v role, the installer displays a pop-up asking you to install Hyper-V before continuing.
- It checks that the server has adequate memory (at least 6GB, preferably 8GB) and storage space (at least 200 GB). A warning message is displayed if this is not available.

The Installation directory screen appears:



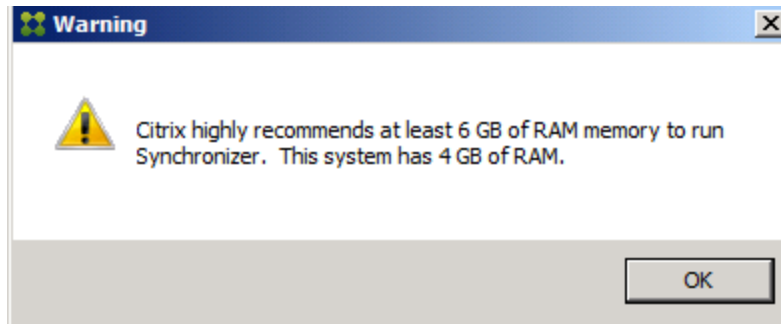
The default Installation folder is displayed:

C:\Program Files\Citrix\Synchronizer

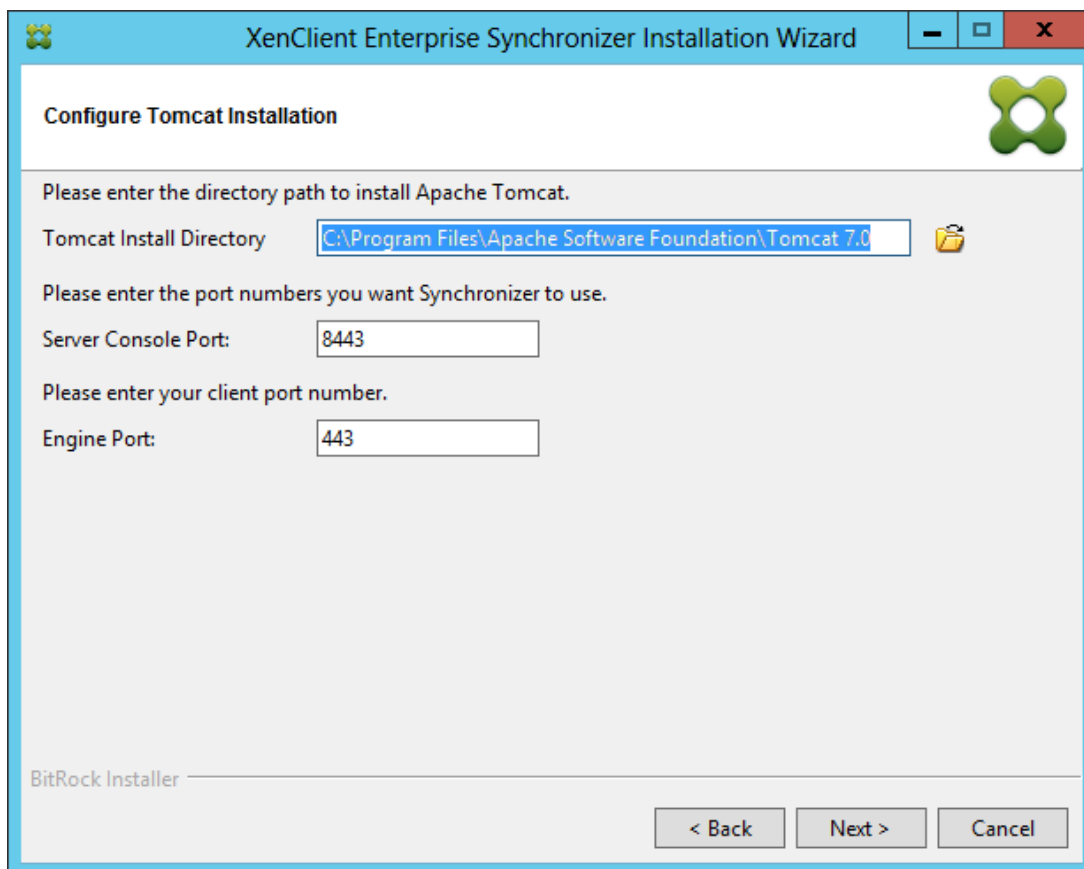


Both Synchronizer and Tomcat have a /bin folder. Do not install them in the same location.

8. Click on **Next** to install into this folder, or click the folder icon (📁) to select another folder.
9. A warning message appears recommending that you dedicate at least 6 GB of RAM memory to run Synchronizer. Click **OK** to close the warning message:



10. The installer collects information used to install the Apache Tomcat server. Most of Synchronizer's disk space consumption is stored within the Tomcat directory.



Specify the following information:

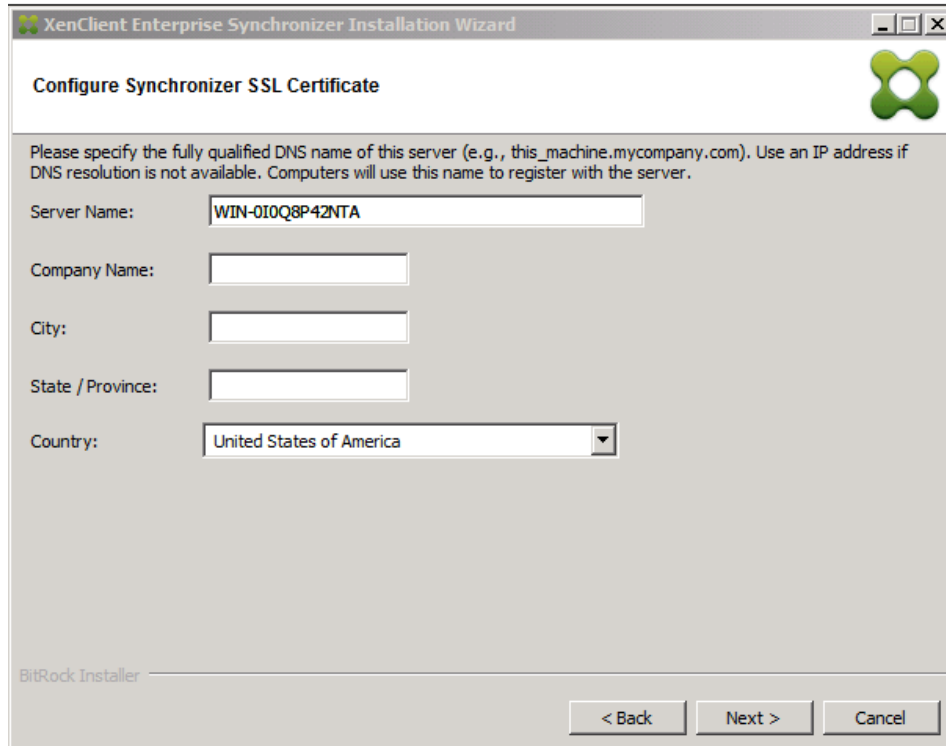
- Tomcat Installation directory: use the default or click the folder icon (📁) and browse to select another directory
- Tomcat Port for Synchronizer: **8443** (default)  
Port used by Engines and Administrators to connect the Synchronizer.
- Tomcat Port for XenClient Enterprise Engines: **443** (default)  
Port used by the Synchronizer to send virtual machines and queries to Engines.

11. Click **Next** to continue.



Both Synchronizer and Tomcat have a /bin folder. Do **not** install them in the same location.

12. The installer collects information for the Server's SSL Certificate:



The image shows a screenshot of the 'XenClient Enterprise Synchronizer Installation Wizard' window. The title bar reads 'XenClient Enterprise Synchronizer Installation Wizard'. The window has a green logo in the top right corner. The main heading is 'Configure Synchronizer SSL Certificate'. Below the heading, there is a paragraph of instructions: 'Please specify the fully qualified DNS name of this server (e.g., this\_machine.mycompany.com). Use an IP address if DNS resolution is not available. Computers will use this name to register with the server.' Below this text are five input fields: 'Server Name:' with the value 'WIN-010Q8P42NTA', 'Company Name:', 'City:', 'State / Province:', and 'Country:' with a dropdown menu showing 'United States of America'. At the bottom left, it says 'BitRock Installer'. At the bottom right, there are three buttons: '< Back', 'Next >', and 'Cancel'.

Enter the following for the SSL Certificate:

- Fully qualified domain name; use IP address if the name is not available.
- Organization or company name. Do not include punctuation in the name.
- City
- State or Province
- Select Country from the dropdown list

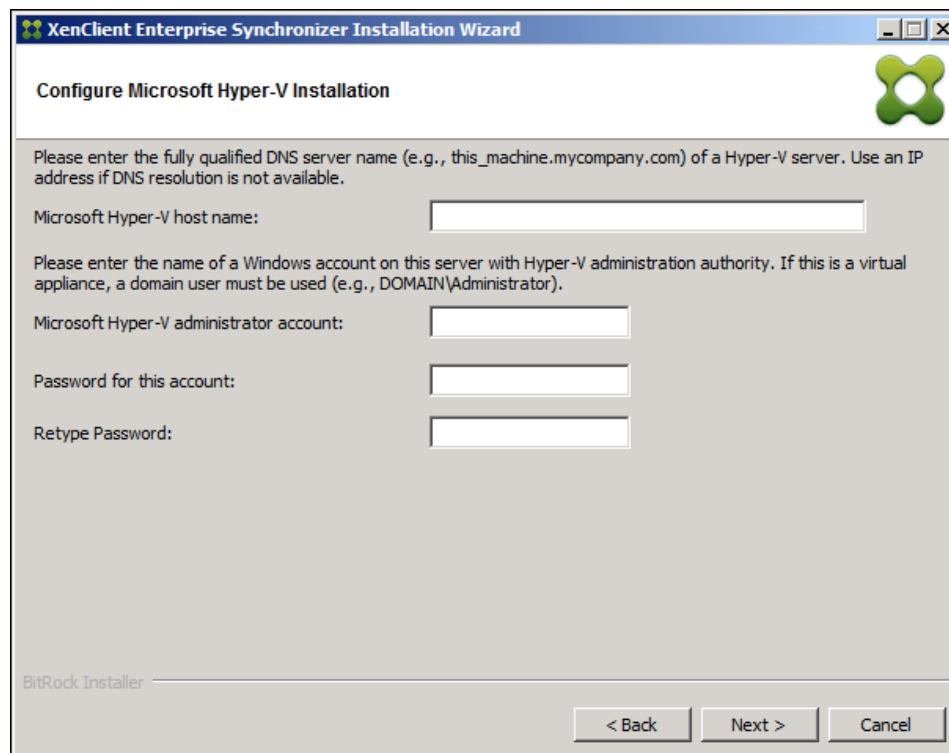
The installer creates a self-signed certificate to enable SSL on Synchronizer.

You may install your own certificate obtained from RSA or other certificate authorities as described here:

<http://tomcat.apache.org/tomcat-7.0-doc/ssl-howto.html>


13. Click **Next** to continue.

14. The installer collects information for the Hyper-V server:



The screenshot shows the 'Configure Microsoft Hyper-V Installation' window of the XenClient Enterprise Synchronizer Installation Wizard. The window has a title bar with the product name and standard Windows window controls. Below the title bar is a green Xen logo. The main content area contains instructions: 'Please enter the fully qualified DNS server name (e.g., this\_machine.mycompany.com) of a Hyper-V server. Use an IP address if DNS resolution is not available.' followed by a text input field for 'Microsoft Hyper-V host name:'. Below that, another instruction: 'Please enter the name of a Windows account on this server with Hyper-V administration authority. If this is a virtual appliance, a domain user must be used (e.g., DOMAIN\Administrator).' followed by three text input fields for 'Microsoft Hyper-V administrator account:', 'Password for this account:', and 'Retype Password:'. At the bottom left, it says 'BitRock Installer'. At the bottom right, there are three buttons: '< Back', 'Next >', and 'Cancel'.

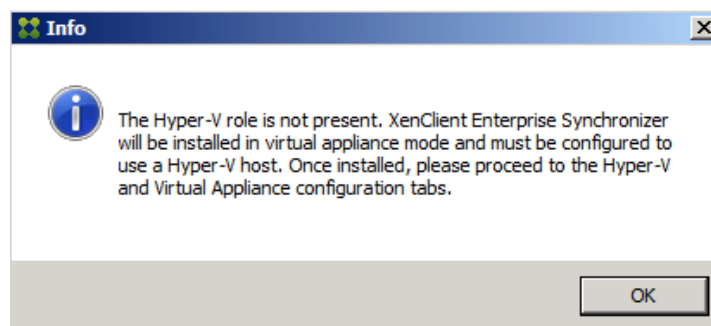
Enter the user name and password for Hyper-V administrator account.

-  Enter a user name and password of an account with sufficient privileges to remotely manage Hyper-V. If this server is running inside of a Virtual Machine, you may use the domain administrator account; if this server is installed into the base platform, you may use the local system administrator account.

The installer checks that

- the account and password exist
- the account has local administrator rights

If one or both of these validations fails, an appropriate warning message is displayed, indicating that Synchronizer will be installed as a virtual appliance:

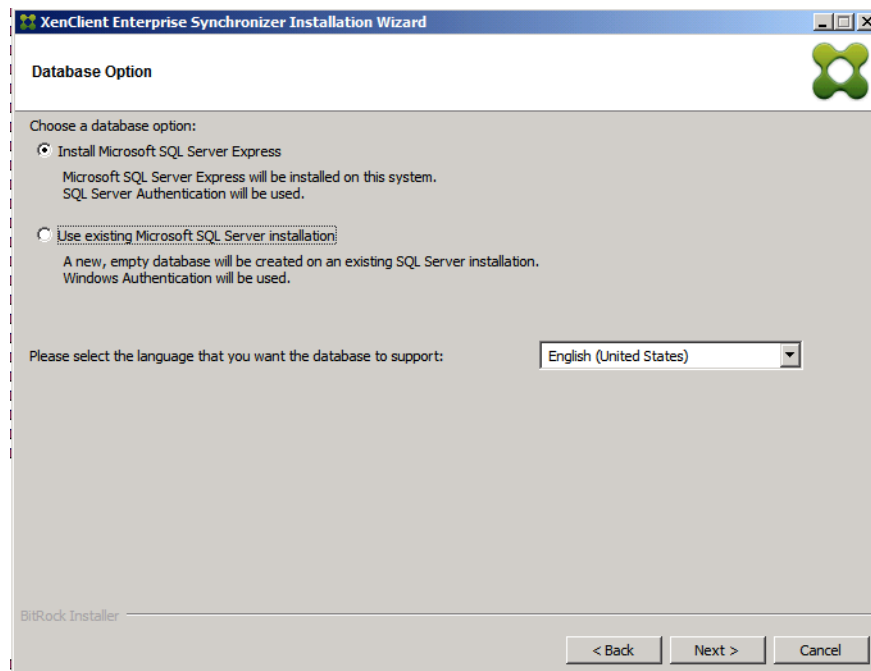




Click **OK** and correct any problems with the account before continuing.

Click **Next** to continue after clearing the warning dialog.

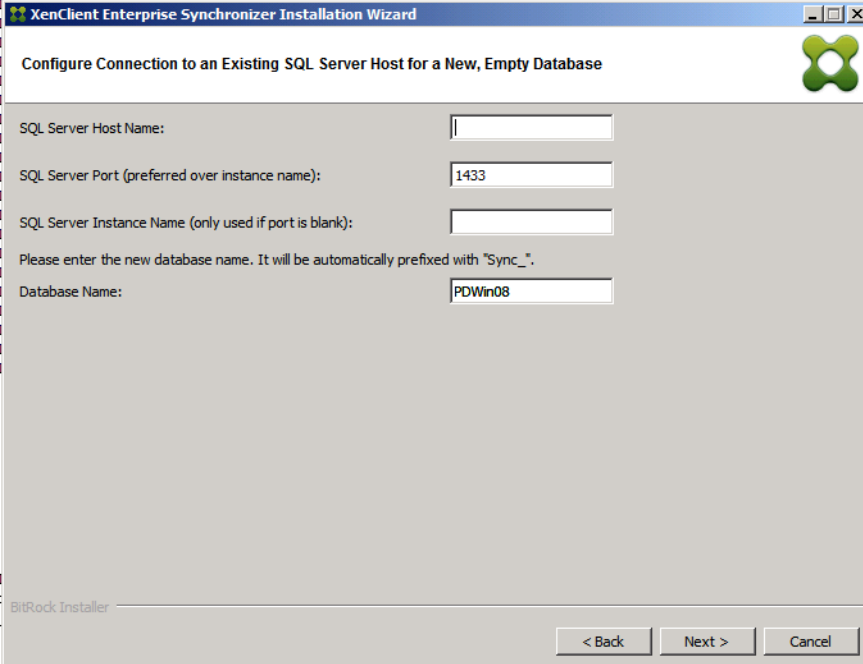
15. Select a location for the database. Synchronizer supports two database options; you can install Microsoft SQL Express, or use an existing Microsoft SQL Database Server. In the Database Option screen, select the radio button for the database location; click **Next**.



16. If you are configuring a connection to an existing SQL server host for a new empty database, the installation prompts you to specify the SQL server host name, the server port number, an instance name, and the database name.



The SQL server port number is preferred over the database instance name. The SQL server instance name is only used if the server port is left blank.



**XenClient Enterprise Synchronizer Installation Wizard**

Configure Connection to an Existing SQL Server Host for a New, Empty Database

SQL Server Host Name:

SQL Server Port (preferred over instance name):

SQL Server Instance Name (only used if port is blank):

Please enter the new database name. It will be automatically prefixed with "Sync\_".

Database Name:

BitRock Installer

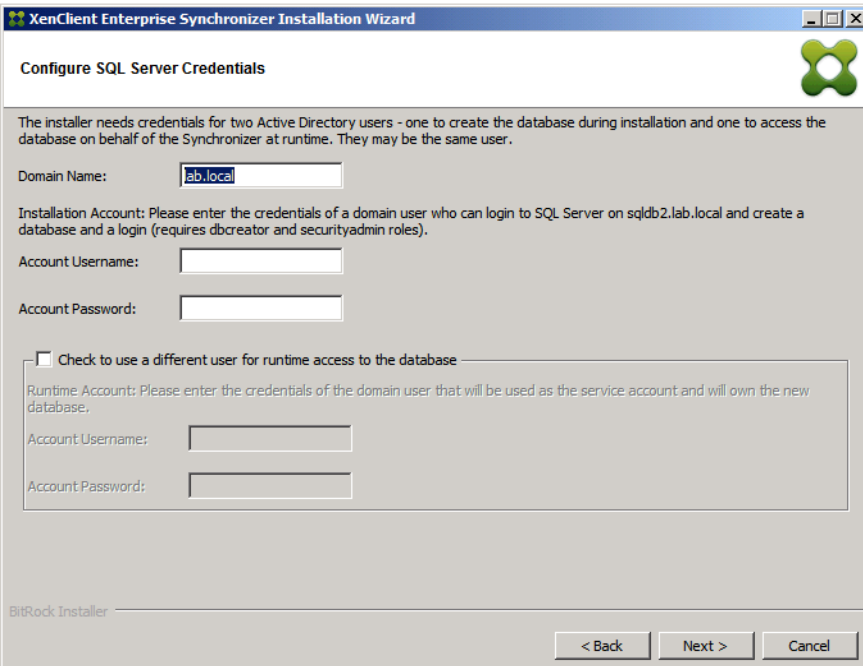
< Back    Next >    Cancel

17. When configuring the SQL server, you must provide credentials for two Active Directory users; one set of credentials is used to create the database during installation. The second set of credentials is used to access the database on behalf of Synchronizer at runtime.



The two sets of Active Directory credentials can be the same user.

Select the checkbox to use a different user for runtime access to the database. Enter an account username and password; these credentials will be used as the service account and will own the new database.



**XenClient Enterprise Synchronizer Installation Wizard**

Configure SQL Server Credentials

The installer needs credentials for two Active Directory users - one to create the database during installation and one to access the database on behalf of the Synchronizer at runtime. They may be the same user.

Domain Name:

Installation Account: Please enter the credentials of a domain user who can login to SQL Server on sqldb2.lab.local and create a database and a login (requires dbcreator and securityadmin roles).

Account Username:

Account Password:

☐ Check to use a different user for runtime access to the database

Runtime Account: Please enter the credentials of the domain user that will be used as the service account and will own the new database.

Account Username:

Account Password:

BitRock Installer

< Back    Next >    Cancel



When specifying the domain name, keep in mind that the remote server must be in the same domain as the central server.

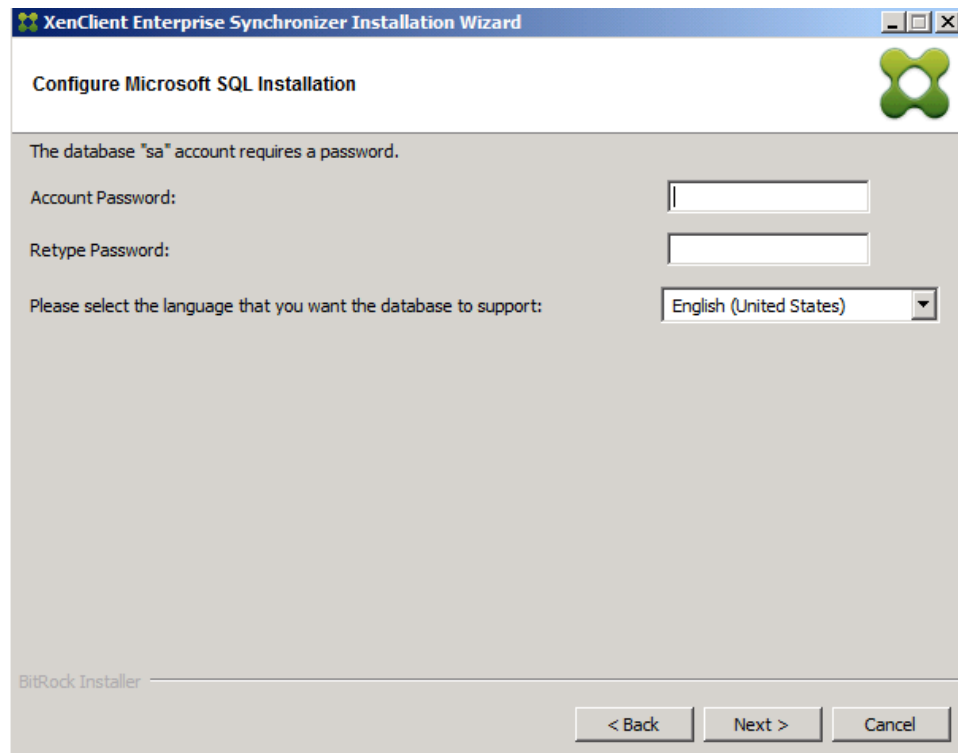
18. When configuring SQL credentials, specify the domain name and credentials for the Active Directory user that is being used by the Central Server.

The screenshot shows a Windows-style window titled "XenClient Enterprise Synchronizer Installation Wizard". The main heading is "Configure SQL Server Credentials". Below this, there is a text input field for "Domain Name:" with "lab.local" entered. A note below the field reads: "Enter the credentials for the Active Directory user that is being used by the Central Server." Below the note are two more text input fields: "Account Username:" and "Account Password:". At the bottom of the window, there are three buttons: "< Back", "Next >", and "Cancel". The bottom-left corner of the window says "BitRock Installer".

19. For SQL Express on the host, the Installer collects information, including the database Administrator username and password. Enter the database administrator username and password. For a Microsoft SQL installation, you are prompted to provide the username and password, and specify the language of the database using the drop-down menu.



The database Administrator password must be **sa**. A warning message appears stating that the password does not have sufficient privileges.



**XenClient Enterprise Synchronizer Installation Wizard**

**Configure Microsoft SQL Installation**

The database "sa" account requires a password.

Account Password:

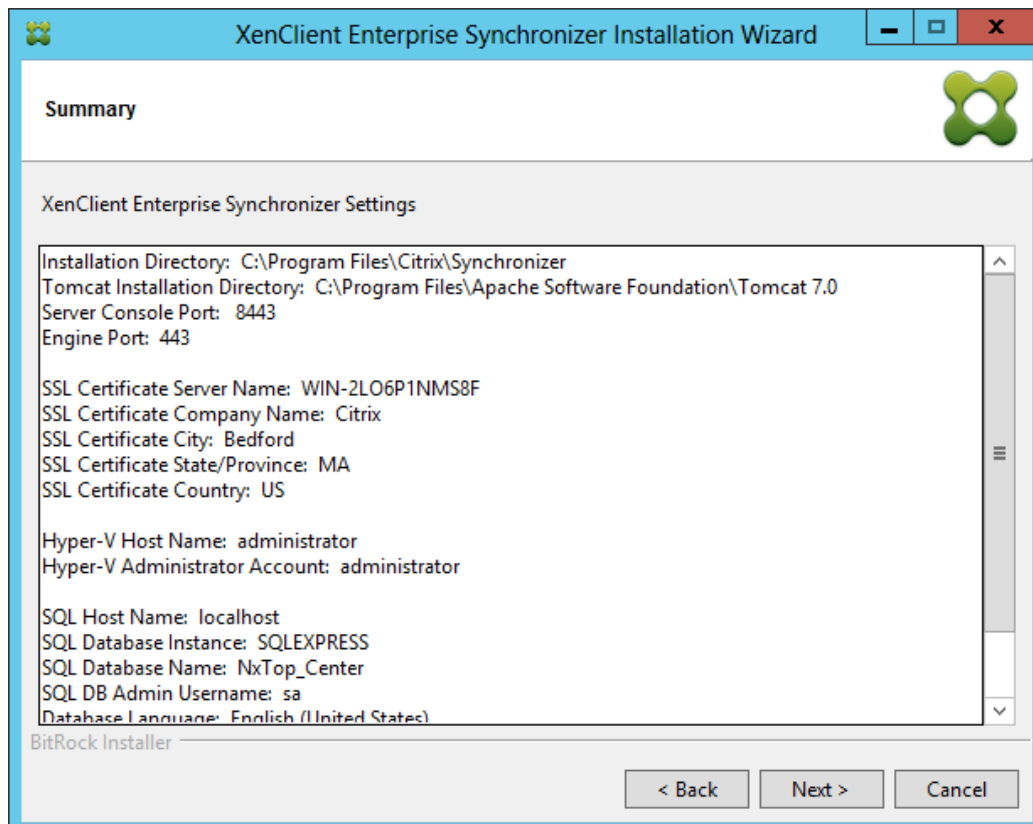
Retype Password:

Please select the language that you want the database to support: English (United States) ▾

BitRock Installer

< Back   Next >   Cancel

After clicking **Next**, the Summary screen appears:



**XenClient Enterprise Synchronizer Installation Wizard**

**Summary**

XenClient Enterprise Synchronizer Settings

Installation Directory: C:\Program Files\Citrix\Synchronizer  
 Tomcat Installation Directory: C:\Program Files\Apache Software Foundation\Tomcat 7.0  
 Server Console Port: 8443  
 Engine Port: 443

SSL Certificate Server Name: WIN-2LO6P1NMS8F  
 SSL Certificate Company Name: Citrix  
 SSL Certificate City: Bedford  
 SSL Certificate State/Province: MA  
 SSL Certificate Country: US

Hyper-V Host Name: administrator  
 Hyper-V Administrator Account: administrator

SQL Host Name: localhost  
 SQL Database Instance: SQLEXPRESS  
 SQL Database Name: NxTop\_Center  
 SQL DB Admin Username: sa  
 Database Language: English (United States)

BitRock Installer

< Back   Next >   Cancel

20. To use an existing SQL database server (where the database is created in a remote SQL engine), enter the following information in the **Configure Microsoft SQL Installation** screen:

- database host name (DNS name)
- database port
- database instance name
- database name
- database credentials, including the account username, password (and confirmation). The DBA name is expected to be **sa**.

The Installer verifies connectivity to the host, and that the host accepted the username and password before continuing. If an issue is reported, correct it before continuing.

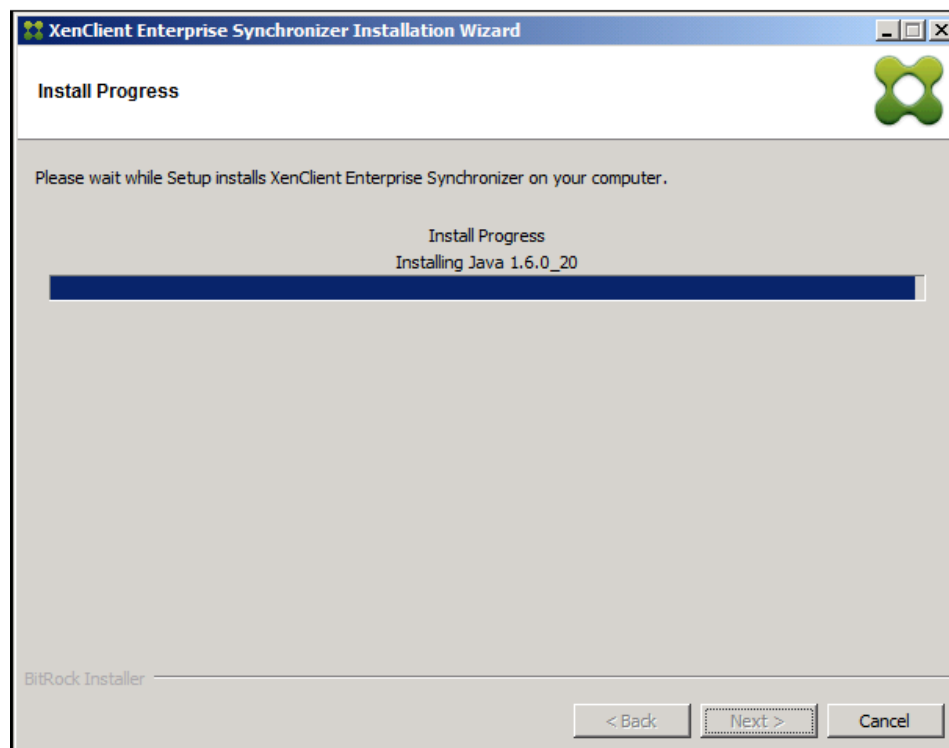
Click **Next** to continue.

The Summary screen appears, listing all the information used to load Synchronizer and its supporting components.

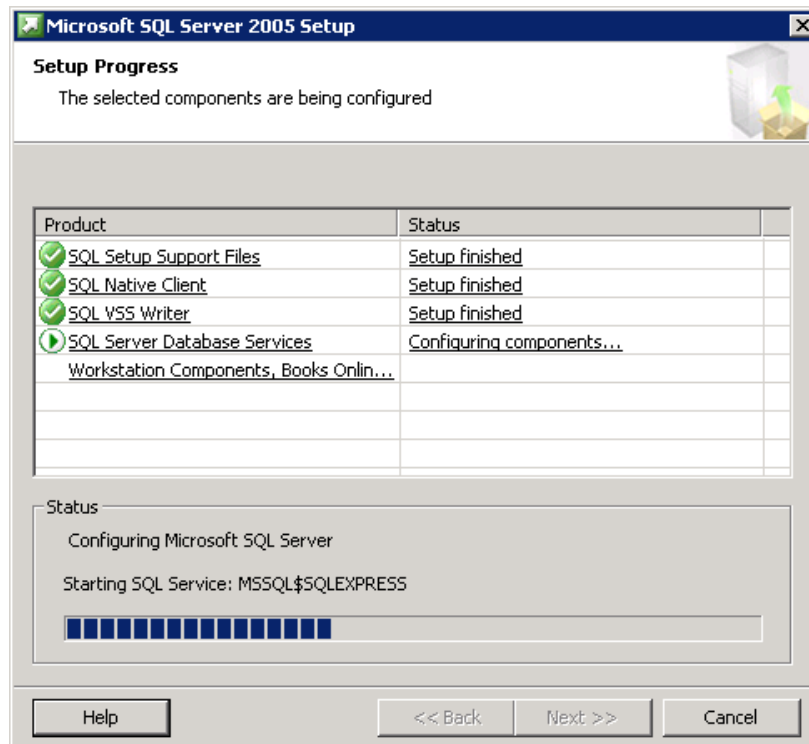
Review the information carefully. If you wish to change any of the values entered for configuration, click **Back** to browse to the appropriate screen, change the values, and then click **Next** until you return to this screen.

21. Click **Next** to start the installation; to cancel the installation, click **Cancel**.

The components and Synchronizer are then installed on the server. Progress is displayed as each component completes.

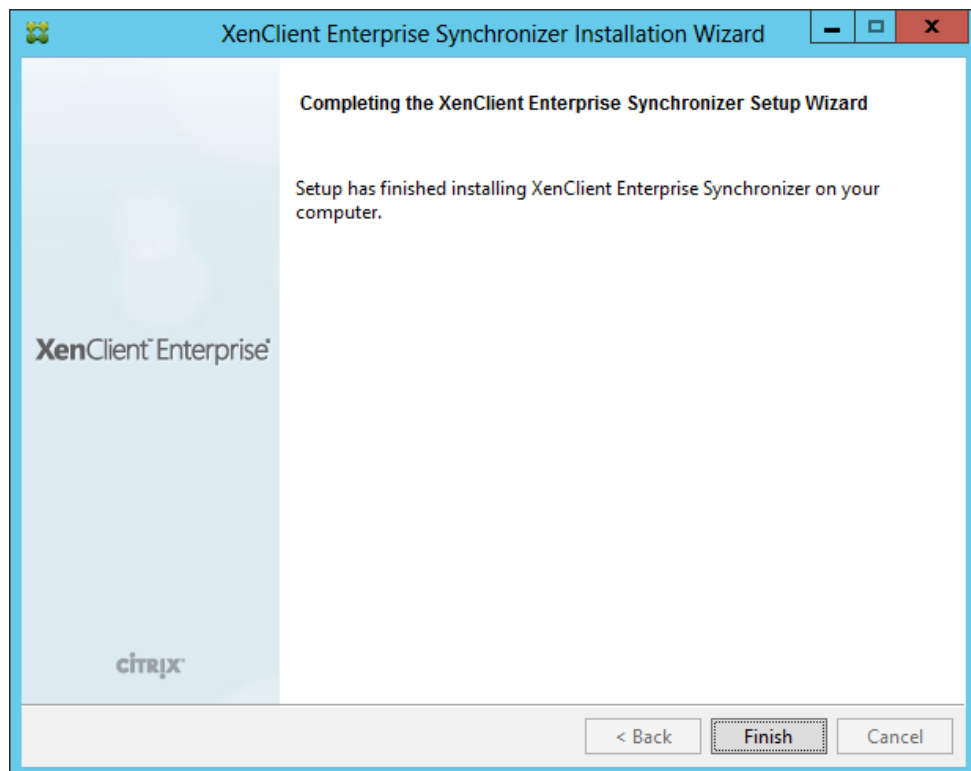


The installation progress for the Microsoft SQL server is also displayed:

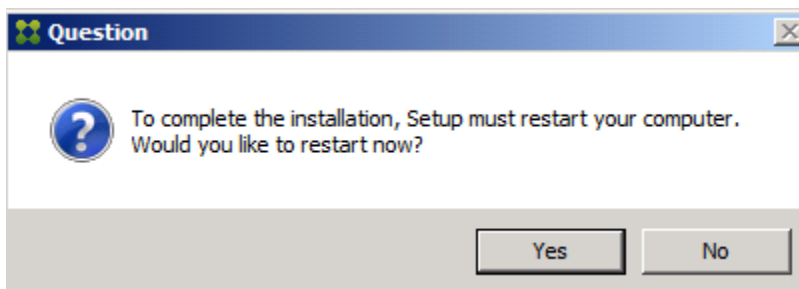


In the event of a failure during installation, correct the reported error. Then, continue the installation from the point where it failed by restarting the installer. Installed components do not need to be reinstalled.

22. When the software is installed, click **Finish**. The installer window will close.



23. To complete Installation, you must restart the server. The installer displays a pop-up box to restart.



Click **OK** at the restart prompt to restart the server.

After the server restarts, an icon for the Synchronizer Console appears on the server desktop.

## Installing Synchronizer as a Virtual Appliance

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In addition to installing Synchronizer directly on a server, you can install it on a virtual machine. This section describes the additional steps used for Virtual Appliance installation.

### Prerequisites

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Use a Windows Server 2008 R2, Windows Server 2012, or Windows Server 2012 R2 system as the host. The Hyper-V host must define an external network named **External Network**.

### Prepare the virtual machine

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To prepare the virtual machine:

1. Prepare a Windows Server (2008 R2, 2012, or 2012 R2) virtual machine in Hyper-V.
  - Give the VM 2 CPUs
  - Ensure the VM's disk is sized large enough to contain virtual machines (several hundred GB)
  - Join the VM to the same Windows domain as the Hyper-V host.
2. Apply all Microsoft updates to the Windows Server VM
3. You must manually add the VM computer account to the local administrator group on the Hyper-V host. This can be done either
  - using the command line:  
`net localgroup administrators "DOMAIN\VMhostname$" /add`
  - using the "Local Users and Groups" tool in Server Manager

### Install as a Virtual Appliance

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To Install Synchronizer as a virtual appliance:

1. Install Synchronizer into the Windows Server VM using the installer.exe.

The installer detects a Windows Server host without the Hyper-V role installed and enabled, which it interprets as installing into a virtual machine (as a virtual appliance). It displays an information pop-up telling you that it will perform a virtual appliance installation.

2. Once installed, import a license (see [License Installation](#) later in this document).



## Configuring Synchronizer

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After installing Synchronizer as virtual appliance, use the following procedure to activate it:

1. In the Synchronizer navigation panel, select **Overview > Synchronizer > Configuration**.
2. Click on the **Hyper-V** tab and check the information:
  - Ensure that the Host Hyper-V Server field is correctly set to the Hyper-V host name.
  - Ensure the Hyper-V User is a domain user, for example "*DOMAIN\Administrator*"
3. Click on the **Virtual Appliance** tab and check the information:
  - Ensure the 3 UNC paths all contain the computer name of the VM.  
Use the **Modify** action to add any missing values.
4. Click the **Activate Appliance** action.

Synchronizer is installed on the VM and is now ready to operate.

## License Installation

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Once installed and before you use Synchronizer, you must import a license. The license not only allows you to operate Synchronizer, but it also defines how many laptops Synchronizer can support. If Synchronizer does not have a valid license, a screen appears indicating that you must first obtain a license.

The license is an XML file delivered by email. Copy it into Synchronizer's import folder (C:\Program Files (x86)\Citrix\Synchronizer\File Import) or a network location that can be reached by the computer browsing Synchronizer.

1. Log into Synchronizer using the Administrator name and password used on the Hyper-V installation panel.
2. In the Synchronizer UI, Click **Overview** in the Navigation panel.
3. Click **Import License** in the Actions panel.  
The import license window appears.
4. Location – select from the dropdown list:
  - Import from local system (where your browser is running) or
  - Import from Server (in the File Import folder in Synchronizer).
5. Specify the file:
  - From local system: Browse to the file location and highlight the file.
  - From server: select from the dropdown list of files in import folder.
6. Click **Finish**.

The license is installed. The number of registered computers and the number available by license are listed on the Summary tab of the Overview.

You can add additional licenses to support more laptops. Contact Citrix support for more information about additional or upgraded licenses.

## About the Active Directory Implementation

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The management application provides enhancements to the Active Directory (AD) implementation. These changes were designed to simplify AD integration by providing the ability to directly browse the AD hierarchy and integrate the entire domain, selected Organizational Units (OU), or individual users. This effectively enables large enterprises to implement stage deployments or manage deployments that are limited to particular groups and their users.

These AD enhancements provide the following benefits:

- Simplify configuration by allowing the Administrator to specify a small set of AD information: the host name, LDAP port number, the username and password.
- The tree-based navigation schema allows the Administrator to interact with AD in a familiar and intuitive way, by enabling you to directly configure users and their groups without importing them from AD.
- Use the search and filtering mechanism to refine what is displayed in the navigation tree and various tables.
- Users and groups are 'imported' into Synchronizer only when a computer is registered to a user, or a VM is assigned. This on-demand import is higher performance and more scalable.



Upgraded users will not see the tree-based navigation view by default. Instead, these users will see a flat view (selectable by clicking the icon); click the hierarchical view icon ( ) at the bottom of the tab to switch views. For more information about AD integration, refer to the Synchronizer online Help.

## Next Steps

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At this point, Synchronizer is ready for use. The next steps include:

Step	On Welcome tab
1. Create one or more virtual machines in Synchronizer	<i>Create a Virtual Machine</i>
2. Publish the virtual machine for use	<i>Publish a Virtual Machine</i>
3. Create Users (of the laptops) in Synchronizer	<i>Create Users and Groups</i>
4. Install an Engine on one or more laptop computers	
5. Assign the virtual machine to users	<i>Assign a virtual machine</i>

When a user logs into an Engine, Synchronizer downloads the virtual machine to the laptop. The user can select the virtual machine and it starts up.