

Installing BizTalk Server 2016 in a Standalone Machine

AUTHOR

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REVIEWER



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Contents

1	About the Author.....	5
2	BizTalk Server Installation scenario.....	5
	Assumptions and out of scope.....	6
3	Important considerations before setting up the server	6
	Join the Local Administrators Group	6
	Turn off Internet Explorer Enhanced Security Configuration (optional)	8
	Disable User Account Control (optional)	9
	Turn Windows Firewall off (optional).....	11
	Configure the Application Event Log.....	12
	Configure Microsoft Distributed Transaction Coordinator (MS DTC).....	14
	Customize Taskbar and Start Menu Properties (optional).....	15
	Set the default browser (Optional).....	17
	Disable Windows Defender (Optional)	19
	Install Critical Windows Updates	20
4	Preparing and install prerequisites for BizTalk Server 2016.....	22
	Important considerations before set up the server	22
	Enable Internet Information Services	22
	Running the BAM Portal in a 64-bit Environment.....	28
	Install Windows Identity Foundation (WIF)	29
	Install and configure SMTP Server Feature (optional).....	31
	Verify Your Installation.....	36
	Install Microsoft Office Excel 2016	37
	Installing and configuring Office 2016 Deployment Tool.....	38
	Installing Microsoft Office Excel 2016.....	39
	Install Visual Studio 2015.....	41
	Remove Microsoft SQL Server Express	44
	Install SQL Server 2016.....	45
	Configure SQL Server Database Mail feature.....	57
	Install BizTalk Server 2016	64
	Verify Your Installation.....	68
	Configure BizTalk Server.....	69
	Pin BizTalk Server Administration to taskbar	72
	Configure SQL Server Network Configuration protocols	74

Validate Mail account used by BizTalk to send BAM Alerts	75
Install BizTalk Adapter Pack	77
Microsoft BizTalk Adapter Pack and Microsoft BizTalk Adapter Pack (x64)	78
Steps to install BizTalk Adapter Pack	78
Add adapters to BizTalk Administration Console	90
Install Critical Windows Updates and BizTalk Server Cumulative Update Package	92
Configure BizTalk Server SQL Jobs.....	92
How to configure Backup BizTalk Server (BizTalkMgmtDb)	93
How to configure DTA Purge and Archive (BizTalkDTADb)	97
MessageBox_Message_Cleanup_BizTalkMsgBoxDb	99
5 Optimize the BizTalk Server 2016 environment.....	100
Deleting BizTalk backup files	100
Implementing a custom sp_DeleteBackupHistory	100
Implementing a Maintenance Plan to clean BizTalk Database backup's files	101
Pre-allocate space and define auto-growth settings for BizTalk Server databases	106
Configure BizTalk Server Windows Services	110
Install and configure BizTalk Health Monitor	113
How to install BizTalk Health Monitor Snap-In.....	113
How to integrate BHM Snap-In into BizTalk Admin Console	114
Install SSO Configuration Application MMC Snap-In (Optional)	117
Installing WinSCP (Optional)	119
Configure BizTalk Jobs History (Microsoft SQL Server Agent job history log).....	122
To resize the job history log based on raw size	123
To resize the job history log based on time.....	123
Managing and cleaning BizTalk Server MarkLog database tables	124
Configure Host and Host instances	128
What are Host, Host Instances and Adapter Handlers?	129
Best practices to Configuring Hosts and Host Instances	130
Power Mode	132
Consider setting the 'text in row' table option to boost BizTalk Server Performance (optional).....	133
How to exploit the Text in Row table option in BizTalk Server.....	133
6 Appendix A: Hardware and Software Requirements	135
Hardware Requirements	135
Software Requirements.....	135

7	Appendix B: Redistributable CAB Files	138
	List of Redistributable CAB Files for BizTalk Server 2016.....	139
8	Appendix C: Basic Configuration vs. Custom Configuration	139

1 About the Author

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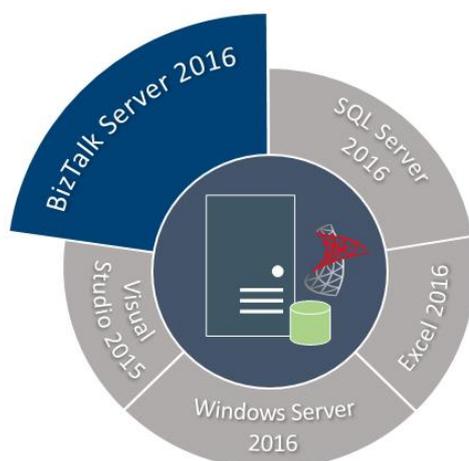
Sandro Pereira lives in Portugal and works as a consultant at DevScope (www.devscope.net). In the past years, he has been working on implementing Integration scenarios both on-premises and cloud for various clients, each with different scenarios from a technical point of view, size, and criticality, using Microsoft Azure, Microsoft BizTalk Server and different technologies like AS2, EDI, RosettaNet, SAP, TIBCO etc.

He is a regular blogger (<http://sandroaspbiztalkblog.wordpress.com/>), international speaker, and technical reviewer of several BizTalk books all focused on Integration. He is also the author of the book “BizTalk Mapping Patterns & Best Practices”. He has been awarded MVP since 2011 for his contributions to the integration community.

You can contact Sandro at: sandro-pereira@live.com.pt (Twitter: [@sandro_asp](https://twitter.com/sandro_asp)).

2 BizTalk Server Installation scenario

This article will explain in detail – a step-by-step guideline - how to install and configure Microsoft BizTalk Server 2016 on a standalone environment running Windows Server 2016. This information will help you plan the installation and configuration of BizTalk Server 2016, applications and components on which it depends focused on creating a development environment (you can also follow this tutorial to help you create production environments, however if this is the case you need to skip some steps).



In this scenario, I will perform a full installation of Microsoft BizTalk Server 2016, using the latest Microsoft platforms:

- Windows Server 2016
- Visual Studio 2015
- Office 2016
- And SQL Server 2016

We will assume that the machine already has installed the operating system: Windows Server 2016 and latest critical Windows updates from Microsoft.

Assumptions and out of scope

It will be assumed that the operating system: Windows Server 2016 and latest critical Windows updates from Microsoft already have been installed.

In this scenario it will be performed a full installation of Microsoft BizTalk Server 2016, with the exception of the deprecated SharePoint Adapter (SharePoint Services Service Side Object Model (SSOM)). The following components will be installed:

- Enterprise Single Sign-On (SSO)
- BizTalk Group
- BizTalk Runtime
- Business Rule Engine
- BAM Tools and Alerts
- BAM Portal
- BizTalk EDI/AS2 Runtime
- Microsoft BizTalk Adapters for Enterprise Applications (BizTalk Adapter Pack)
- Microsoft UDDI Services
- Microsoft BizTalk ESB Toolkit

3 Important considerations before setting up the server

There are some important considerations or suggestions, since some of these operations are not mandatory, that we can set before starting the installation and configuration of the server.

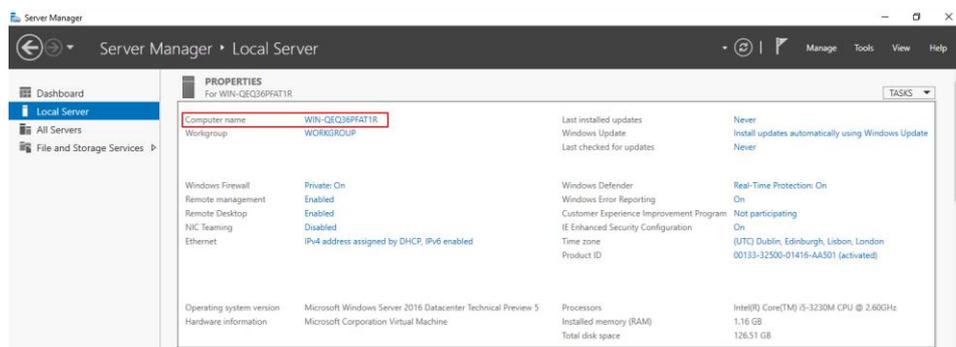
As always one of the downsides of dealing with a new versions of Windows Server is figuring out to where some of the features/options have moved in this new release. Fortunately for us, this version is similar or identical to the previous one (Windows Server 2012) making the installation and configuration process easier.

Join the Local Administrators Group

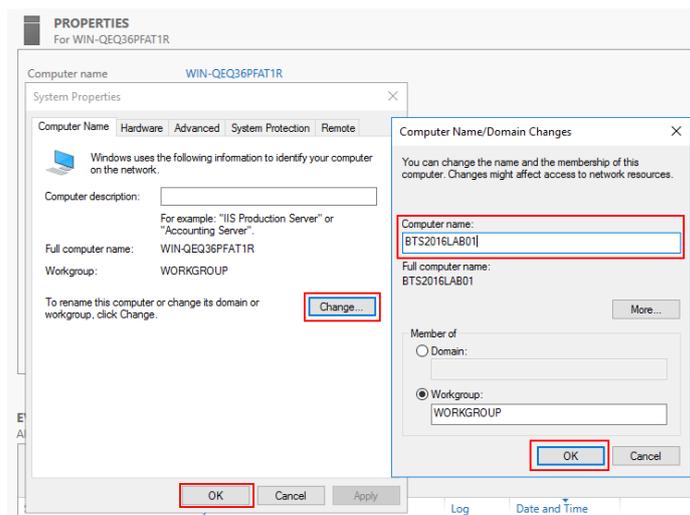
To be able to install and configure BizTalk Server 2016, you have to log on the server using an administrator account on the local computer.

To add a member to a local group using the Windows interface

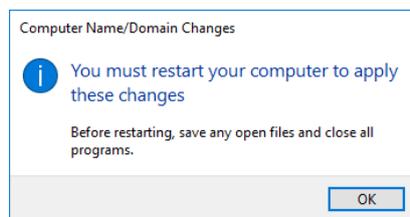
- Press the “Windows key” to open the Start menu.
- Type “Computer Management” and click in “Computer Management” option from the Search window.
 - Or type “Administrative Tools” and then select “Computer Management”
 - Or access to the “Server Manager” console, in the menu select the “Tools” option and then click in “Computer Management”



- Click on the “Change” button to edit computer name and domain information, which will pop up this dialog:



- Now you can finally change the name of the computer. You’ll have to reboot after you make this change.



Turn off Internet Explorer Enhanced Security Configuration (optional)

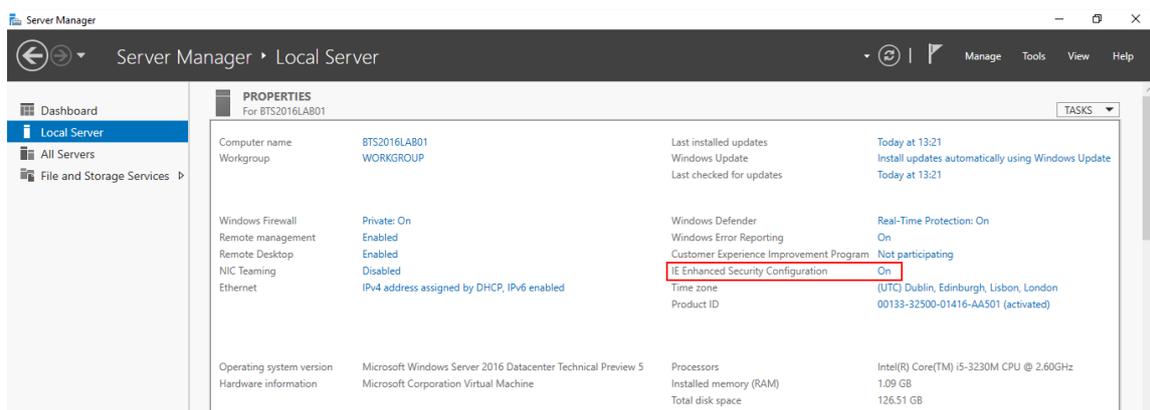
Internet Explorer Enhanced Security Configuration established a configuration for your server and for Microsoft Internet Explorer that decreases the exposure of your server to potential attacks that can occur through Web content and application scripts. As a result, some Web sites may not display or perform as expected.

IMPORTANT NOTE: This step is optional and I only suggest to do this in development environments. For some clients this feature can be very important in production environments and they don't want to disable it.

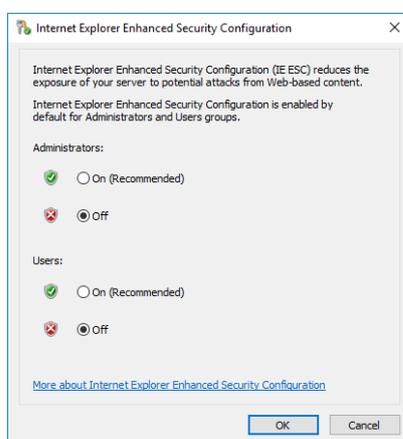
By default, Internet Explorer Enhanced Security Configuration is enabled on Windows Server 2016 and can be configured through Server Manager.

To disable Internet Explorer Enhanced Security Configuration (IE ESC) in Windows Server 2016

- Start by running the “Server Manager”, if it is not already open, on the Windows Start menu, click the “Server Manager” option.
- In the Server Manager Dashboard, from the scope pane (on the left side) click on “Local Server”.
- In the Server Properties for the “Local Server”, you'll see the option for “IE Enhanced Security Configuration”. Click “On” to change the option.



- A dialog box appears, letting Internet Explorer Enhanced Security Configuration be enabled/disable separately for normal users and administrators, turn off both. After disable both options, click “OK”.



- Click the Refresh button at the top of the Server Manager and the “IE Enhanced Security Configuration” should now show as “Off”

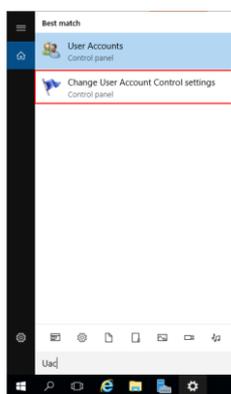
Disable User Account Control (optional)

User Account Control (UAC) is a security component that can help prevent unauthorized changes to your computer and that allows an administrator to enter credentials during a non-administrator's user session to perform occasional administrative tasks. Whenever you need to configure a Windows Server 2016 setting, even if you are logged on as the administrator - you need elevated privileges - this is by design, and part of the fierce security initiative since Windows Server 2008. UAC notifies you when changes are going to be made to your computer that require administrator-level permission and before you can complete any administrative task, the User Account Control manager pops-up with a 'Continue' message. These types of changes can affect the security of your computer or can affect settings for other people that use the computer.

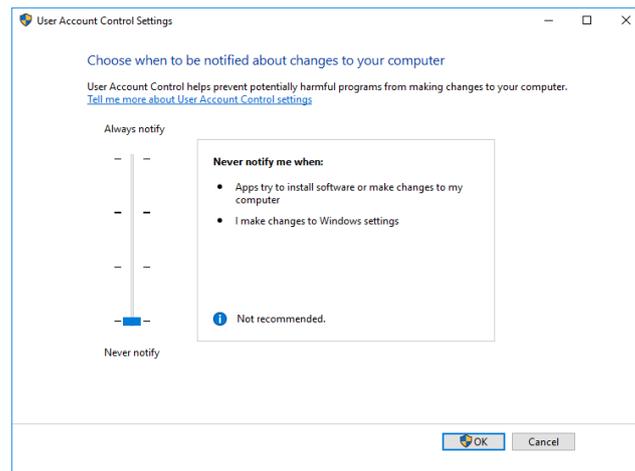
IMPORTANT NOTE: It recommend that you leave UAC on to help make your computer secure. This step is optional and I only suggest to do this in development environments. For some clients this feature can be very important in production environments and they don't want to disable.

To Disable User Account Control (UAC):

- Press the “Windows key” to open the Start menu.
- Type “Change User Account Control Settings” or “UAC” and click in “Change User Account Control Settings” option from the Search window.



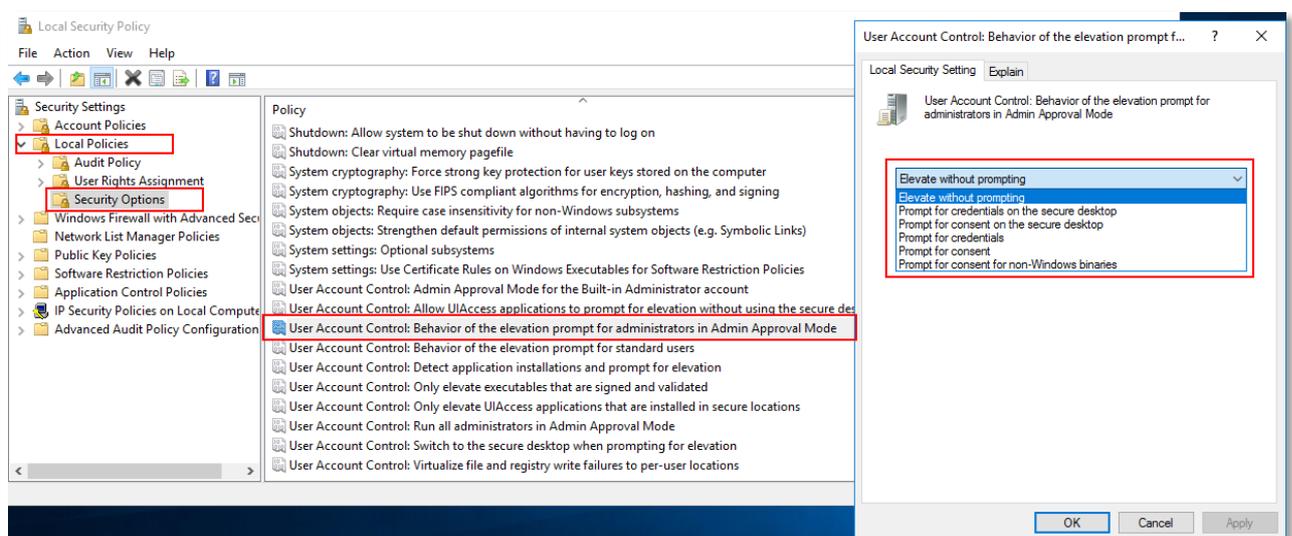
- Or press the “Windows key” to open the Start menu, and then click “Control Panel”.
- In “Control Panel”, click “User Accounts”.
- In the “User Accounts” window, click “User Accounts”.
- In the “User Accounts” window, click in “Change User Account Control Settings” option.
- In the “User Account Control Settings” window, select "Never notify me when..." to disable UAC.



You'll need to reboot the server before the changes take effect.

If you can't stand the User Account Control prompts, but you'd still like to retain a little bit of security, you can disable it for Administrator accounts only by changing the Windows behaviour to automatically elevate privilege level for administrators without prompting. This can be done by:

- Press the "Windows key" to open the Start menu.
- Type "Local Security Policy" and click in "Local Security Policy" option from the Search window.
- On the left navigation tree of the "Local Security Policy" windows, expand the option "Local Policies" and then select "Security Options"
- Find the following option in the list: "User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode" and double-click on it.
- On the "User Account Control: Behavior of the elevation prompt for administrators in Admin Approval Mode" properties window, change the setting to "Elevate without prompting".
- And then click "OK"



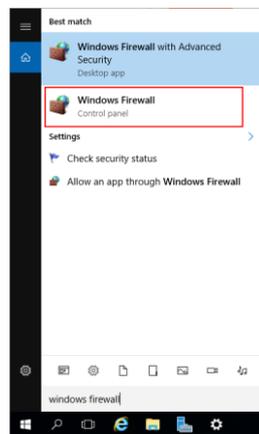
Turn Windows Firewall off (optional)

I always advise you to turn Windows Firewall on BizTalk Server development environments unless there are specific reasons for not doing that.

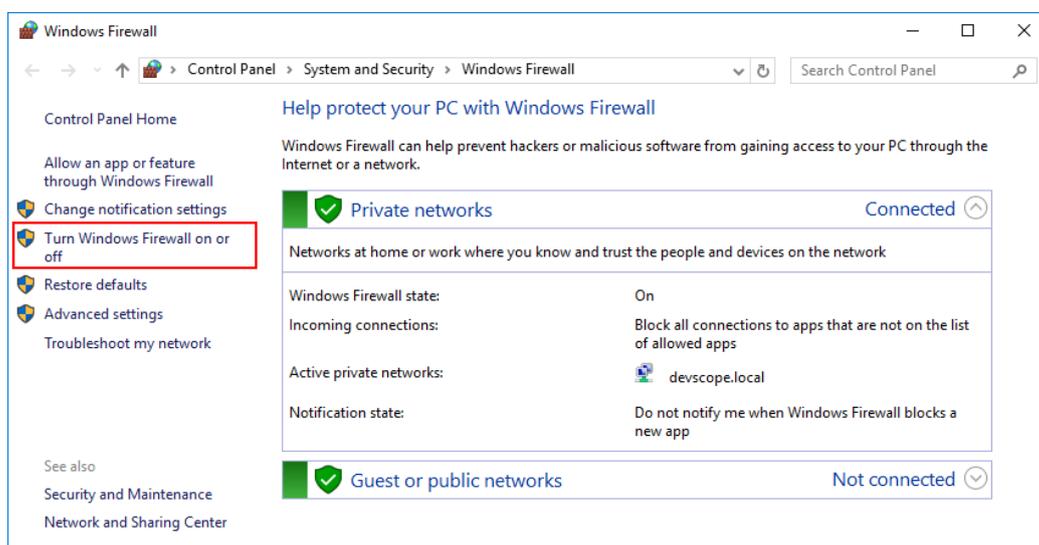
IMPORTANT NOTE: This step is optional and I only suggest to do this in development environments. For some clients this feature can be very important in production environments and they don't want to turn it off. However, in many scenarios, these machines are not exposed to the outside and even if this occurs, they can be “protected” by the own network infrastructure, and in such cases it may not be required that the Windows Firewall is turned on.

To turn Windows Firewall off:

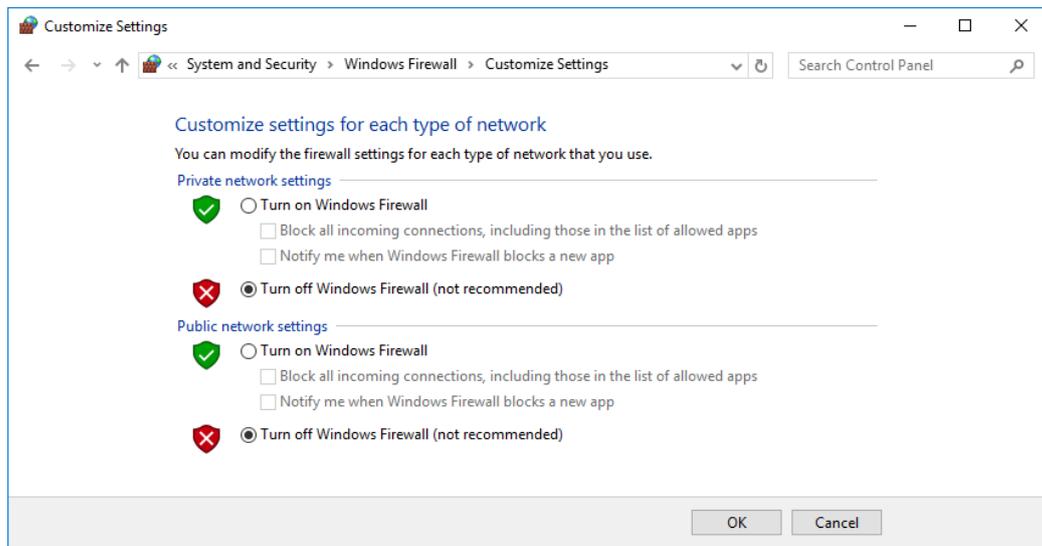
- Press the “Windows key” to open the Start menu.
- Type “Windows Firewall” and click in “Windows Firewall” option from the Search window.



- Or press the “Windows key” to open the Start menu, and then click “Control Panel”.
- In “Control Panel” address bar, type “Control Panel\All Control Panel Items”, and then select “Windows Firewall” option.
- In the “Windows Firewall” panel, select “Turn Windows Firewall on or off” option



- And select the option “Turn off Windows Firewall (not recommended)” in both settings and click “OK”



Configure the Application Event Log

BizTalk Server setup keeps a record of events in the Application Event Log. Depending on the BizTalk Server features installed, the amount of space required in the log may exceed its limit. If the application event log runs out of space during BizTalk Server setup, the installation will fail. To prevent this from happening, you can change the settings in the Application Event Log.

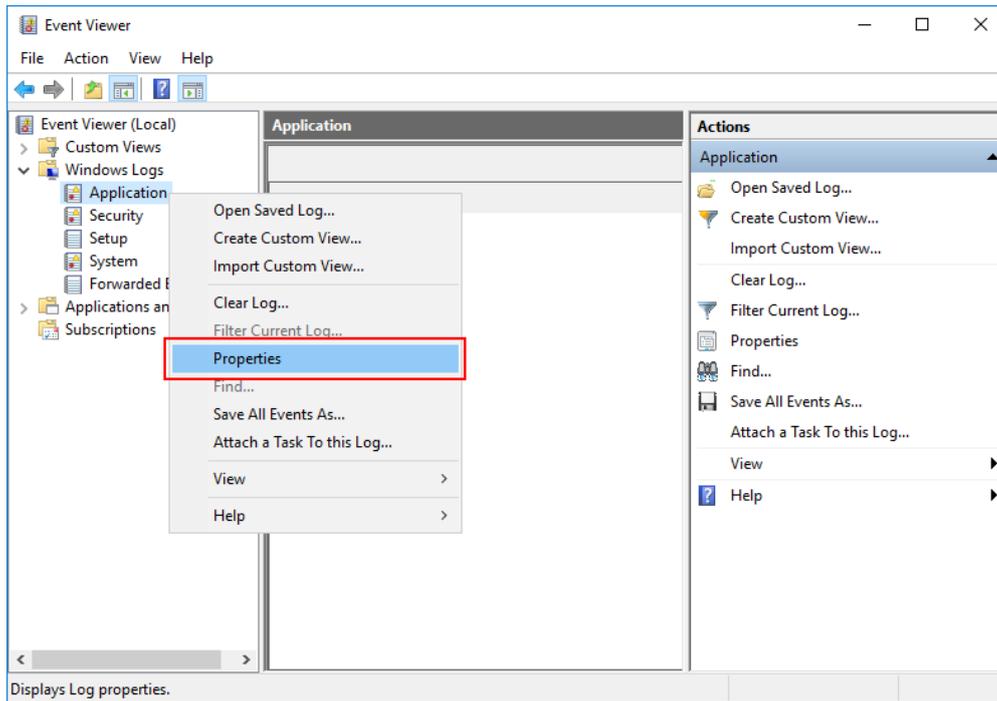
To change settings in the Application Event Log:

- Press the “Windows key” to open the Start menu.
- Type “View event logs” and click in “View event logs” option from the Search window.

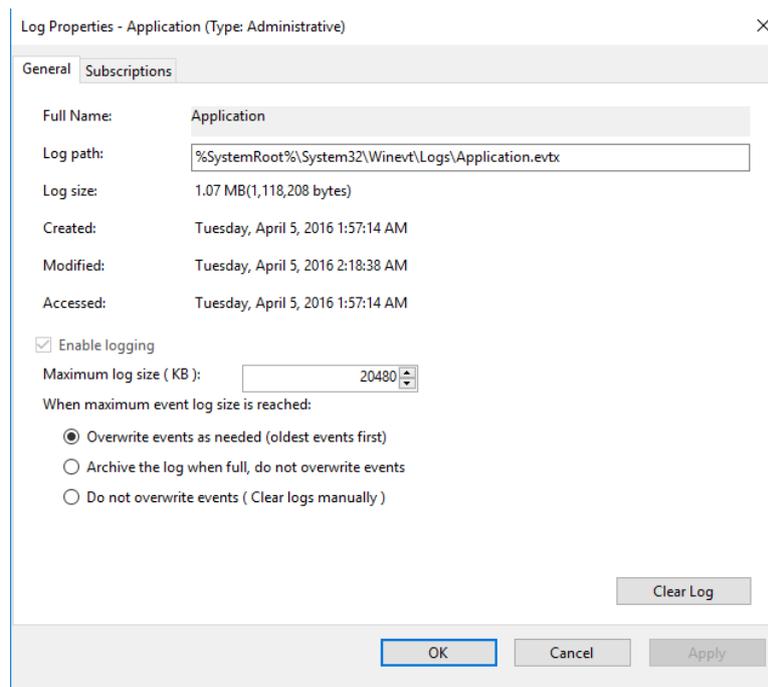


- Or press the “Windows key” to open the Start menu and click the “Server Manager” option.
- In the “Server Manager” menu select the “Tools” option and then click in “Event Viewer”
- In the “Event Viewer” windows, expand “Windows Logs”.

- Right-click “Application”, and then click “Properties”. This opens the Log Properties dialog box.



- To see how much available space your log has, compare the Log Size field with the Maximum log size field.
- To provide more space in the event log, enter a higher number in the Maximum log size field.
- To enable overwriting of old events when the log becomes full, select Overwrite events as needed.
- To clear the log events, click “Clear Log”



- Click “OK”, to close the Event Viewer.

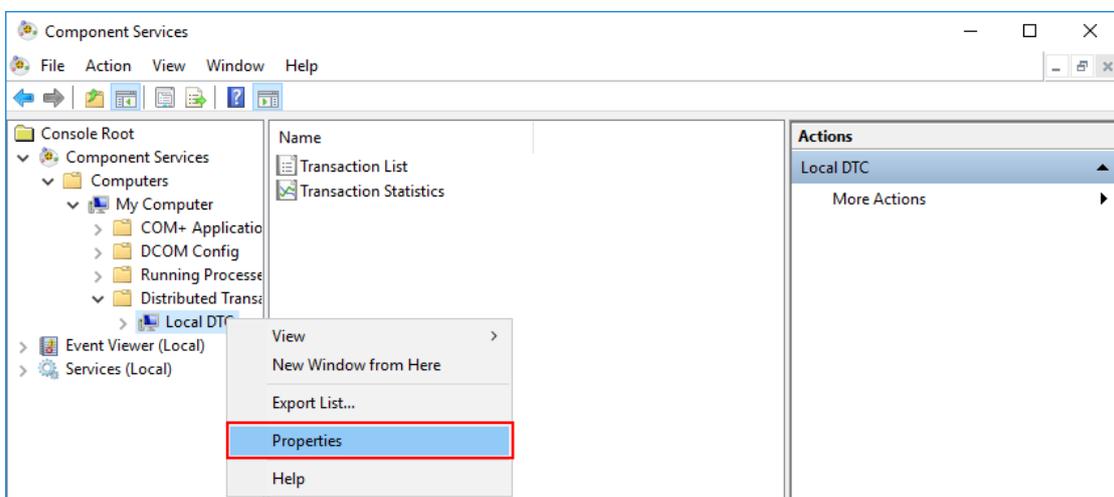
Configure Microsoft Distributed Transaction Coordinator (MS DTC)

Despite this being a standalone installation (BizTalk Server and SQL Server in the same box) in you want to connect BizTalk Server with databases located on a remote SQL server, you will need to turn on MSDTC options (both on the remote SQL Server and BizTalk Server).

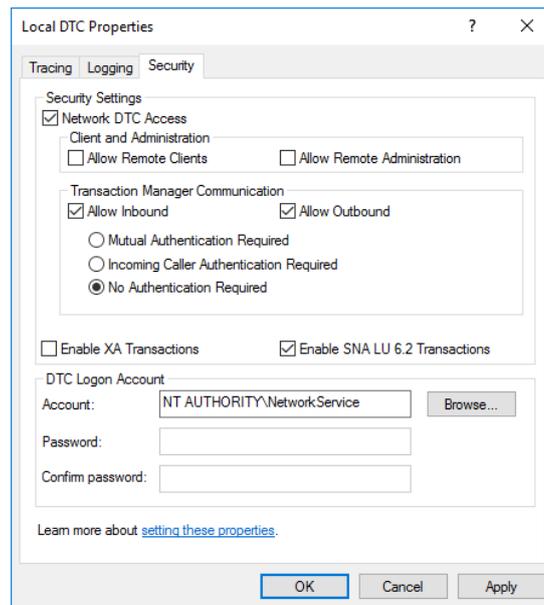
- Configure MSDTC on BizTalk and SQL Servers:
- Press the “Windows key” to open the Start menu.
- Type “dcomcnfg” and click in “dcomcnfg” option from the Search window.



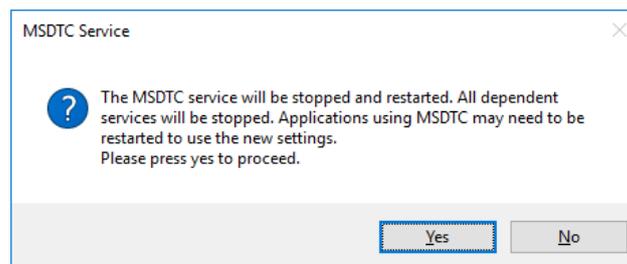
- In the console tree under the “Component Services” windows, expand “Component Services > Computer > My Computer > Distributed Transaction Coordinator”
- Right-click in “Local DTC” and then select “Properties” option,



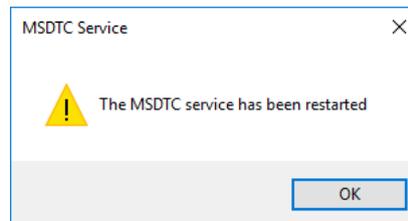
- On the “Local DTC Properties” window, select the “Security” tab and:
 - Ensure that the “Network DTC Access”, “Allow Inbound”, “Allow Outbound”, and “No Authentication Required” options are selected and all others are cleared.



- Click “OK”
- And in the information window, click “Yes”



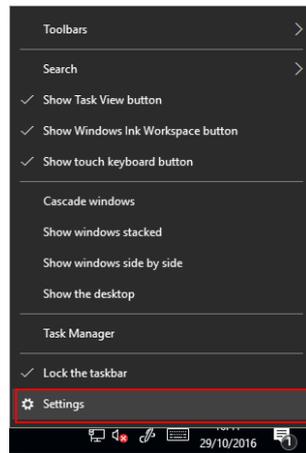
- And in the information window, click “OK”



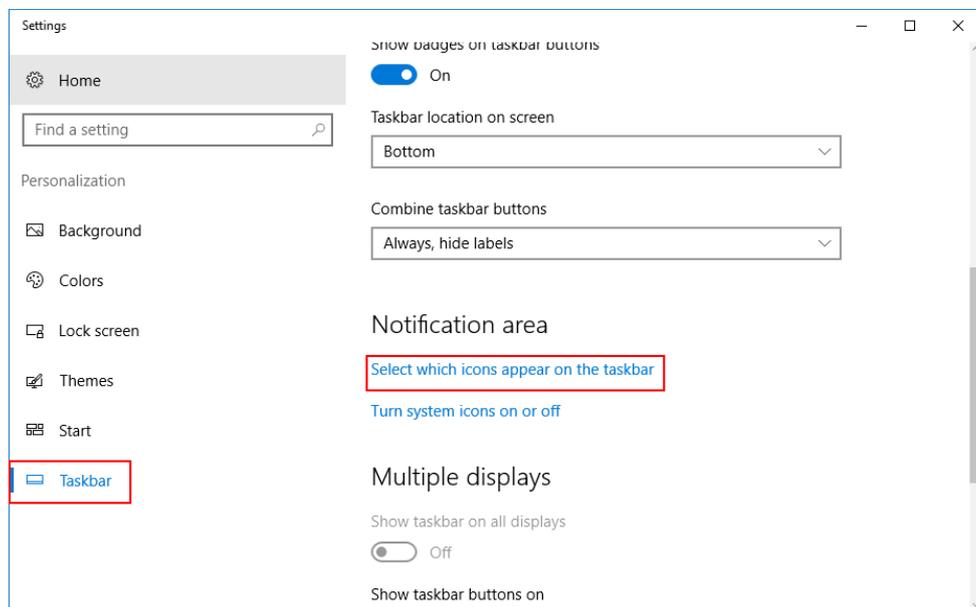
Customize Taskbar and Start Menu Properties (optional)

This is merely a cosmetic and practical option. I hate to see servers with the Volume option, that have no use, being present and Windows Server 2016 provides excellent control over the Taskbar and Start Menu and you can easily hide or show system icons (clock, volume, network, power, input indicator or action center) on taskbar. To accomplish that you can:

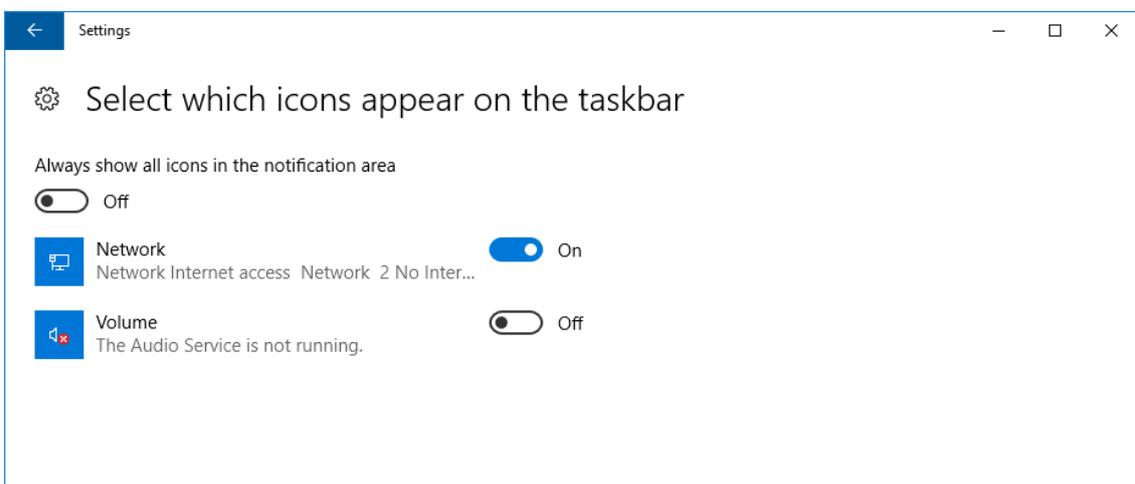
- Simply right-click the taskbar and choose “Settings” option to bring up the “Taskbar” properties;



- On the “Taskbar” tab, in the “Notification Area” section, click the “Select which icons appear on the taskbar” option to bring the “Turn system icons on or off” panel.

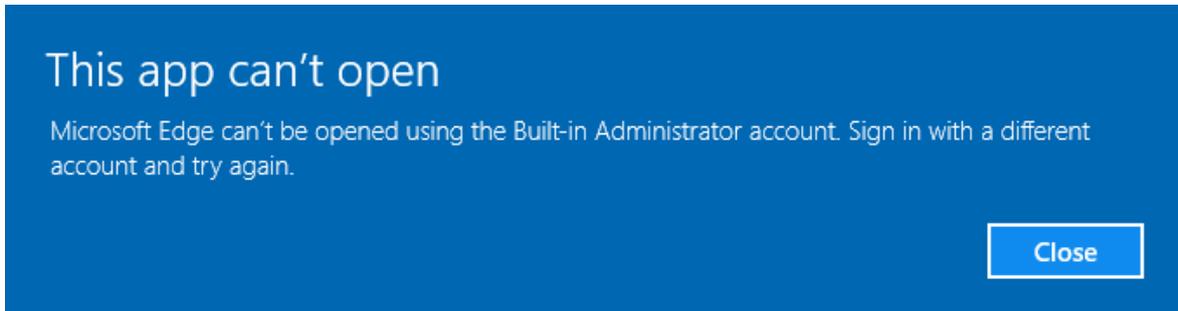


- On the “Select which icons appear on the taskbar” panel, disable all the desired icons, in my case it was the “Volume”. Then close the window.



Set the default browser (Optional)

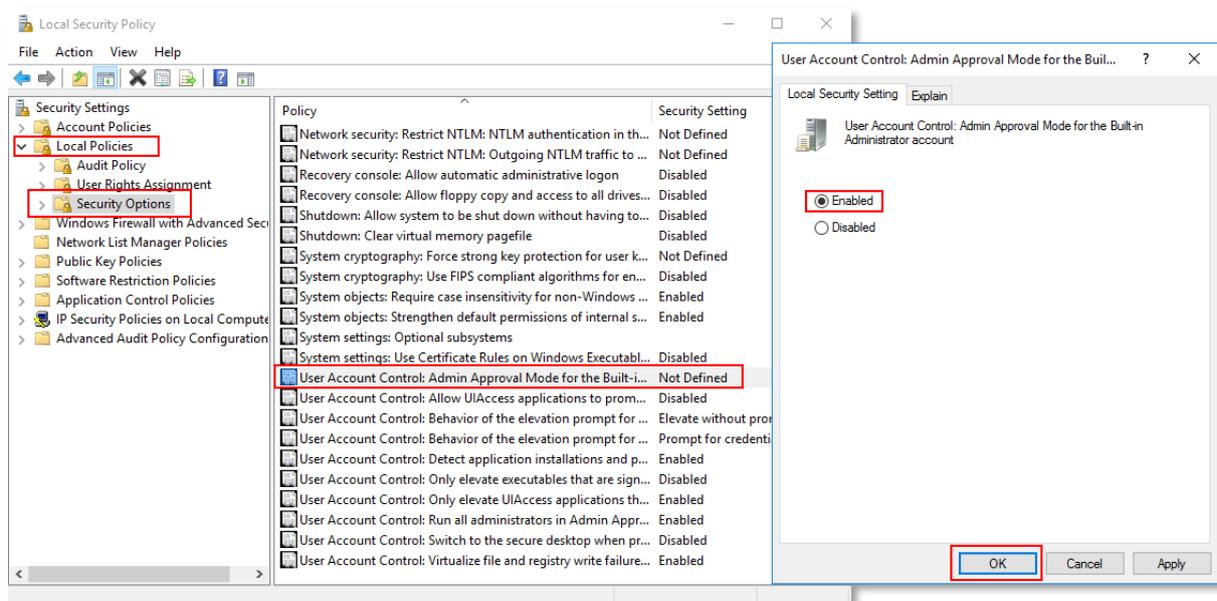
If you are installing a standalone environment using Built-in accounts instead of active directory accounts, which is quite normal in this kind of environment, you may notice that you can't open in Microsoft Edge, which is the default browser set in Windows Server 2016, opening an error windows saying: "Microsoft Edge can't be opened using the built-in administrator account. Sign in with a different account and try again."



This happens because Microsoft decided to make Edge browser a true app and add additional security in place much like the Internet Explorer Enhanced Security that some of you may be familiar with.

There is a workaround that you can apply to solve this "limitation" or to bypass these additional securities and you will be able to use your Built-in Administrator account to navigate Edge:

- Press the "Windows key" to open the Start menu and type "Local Security Policy" or type "secpol.msc" and click in "Local Security Policy" option from the Search window.
- Under "Local Security Policy" windows, on the left navigation tree under Security Settings, navigate to "Local Policies → Security Options"
- And set the policy "Account Control Admin Approval Mode for the Built-in Administrator account" to Enabled

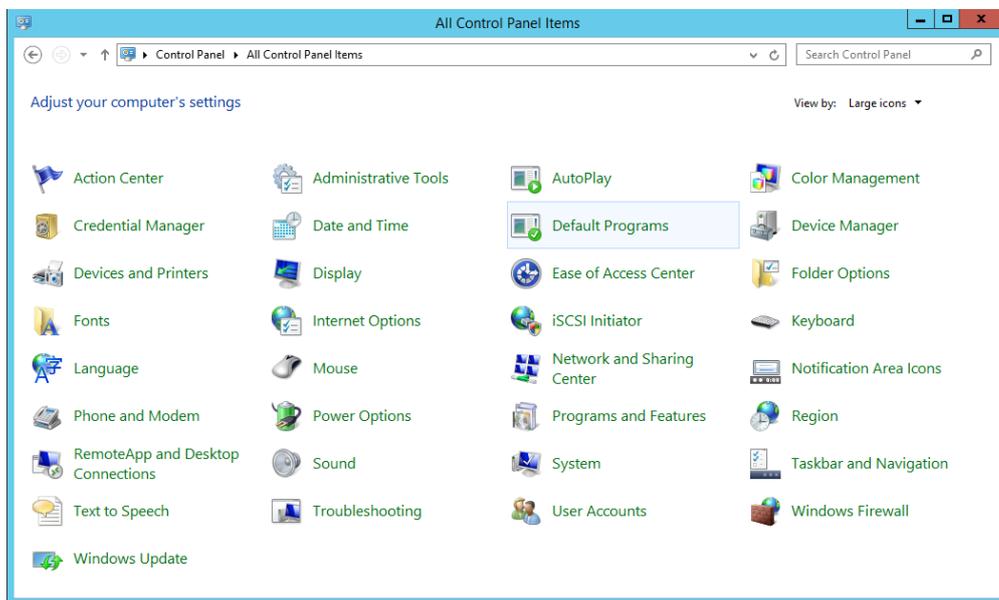


You probably need to restart or log off and log in for the policy to take effect.

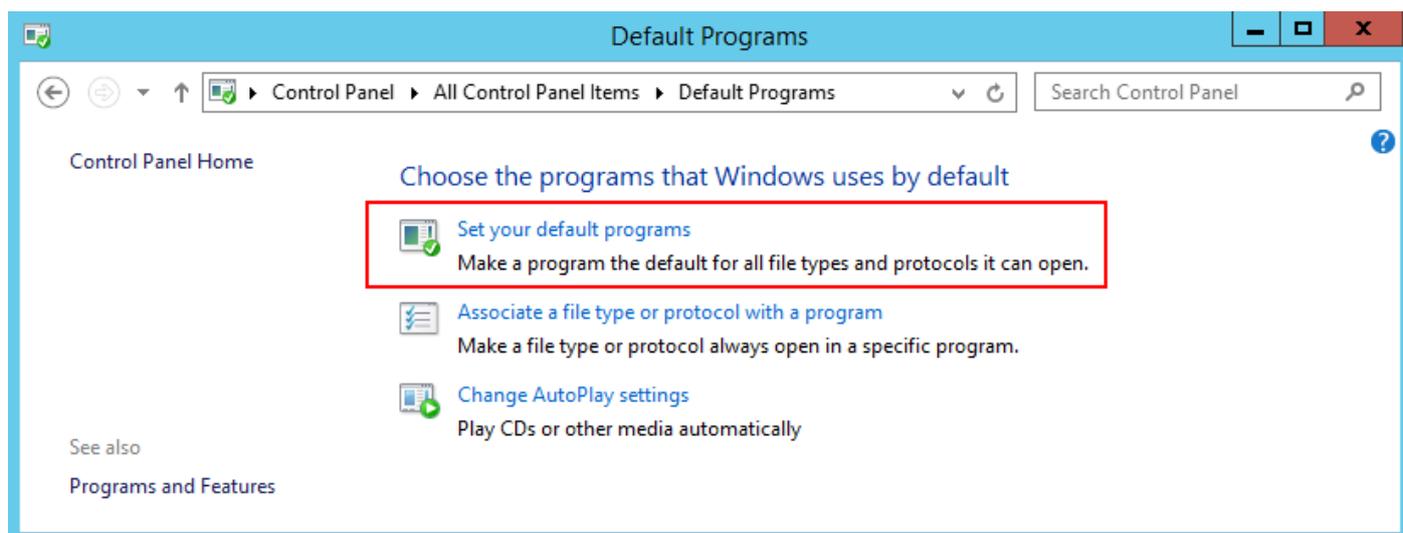
However, I will not advice to do that, because probably the main reason I need to use the Browser in my BizTalk environment is to use the **BAM Portal** and the BAM Portal is still not compatible with Edge browser, it still needs to run in, or the best browser to run it in is, “the old” Internet Explorer.

With that in mind, the best approach to avoid the Edge error and for you to be able to run BAM Portal is to set the Internet Explorer as your default browser. To change the default browser to Internet Explorer you need to:

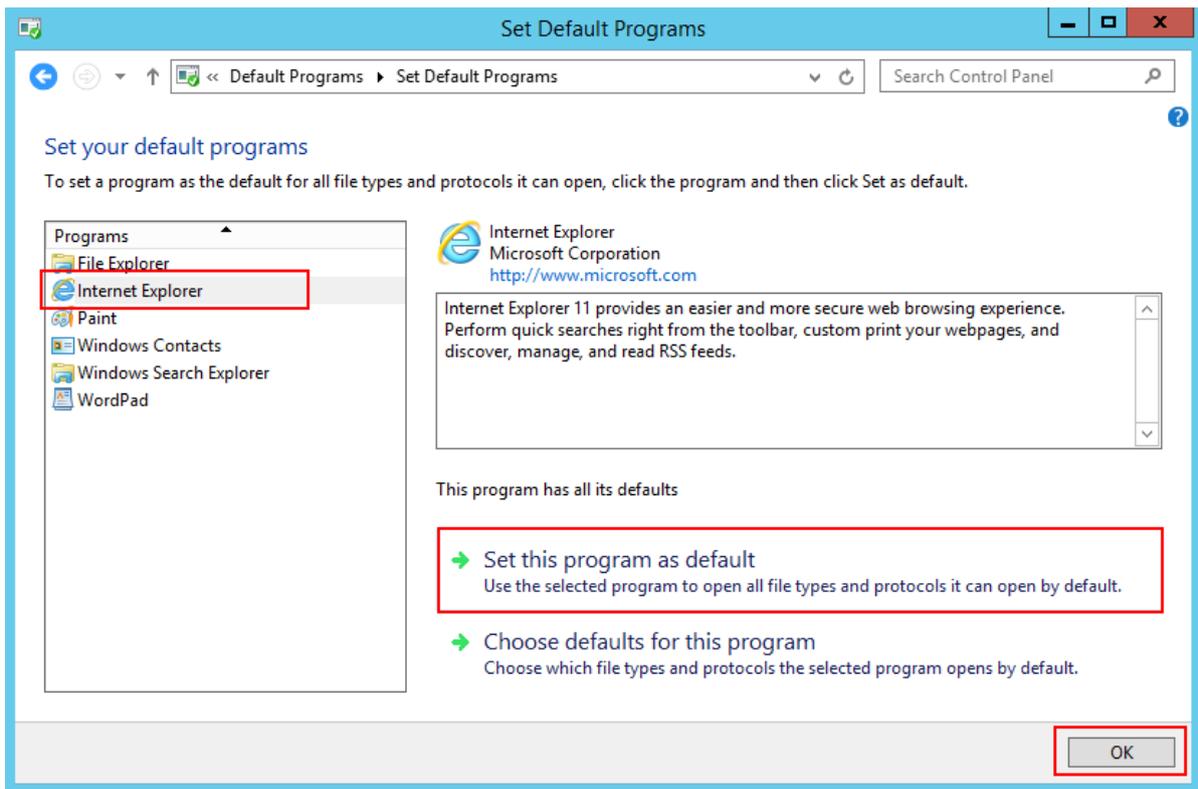
- Open Control Panel by pressing the “Windows key” to open the Start menu, type “Control Panel” and then click “Control Panel”.
- And then select “Default Programs”



- On the “Default Programs” windows click on the option “Set your default programs”



- Select “Internet Explorer” from the “Programs” panel and then click in the option “Set this program as default”



- Click “OK”

Remember that when you set default programs using “Default Programs”, the default setting applies only to your user (or built-in account) and not to other users (or accounts) who might use the same computer.

Disable Windows Defender (Optional)

Windows Server 2016 comes standard with built-in Anti-Malware called Windows Defender like Windows 10 Client. By default, Windows Defender is active and has also turned on Real-Time Protection by default, which can negatively affect BizTalk Server performance.

Antivirus software real-time scanning of BizTalk Server executable files and any folders or file shares monitored by BizTalk Server receive locations can negatively affect BizTalk Server performance. If antivirus software is installed on the BizTalk Server computer, disable real-time scanning of non-executable file types referenced by any BizTalk Server receive locations (usually .XML, but can also be .csv, .txt, etc.) and configure antivirus software to exclude scanning of BizTalk Server executable files.

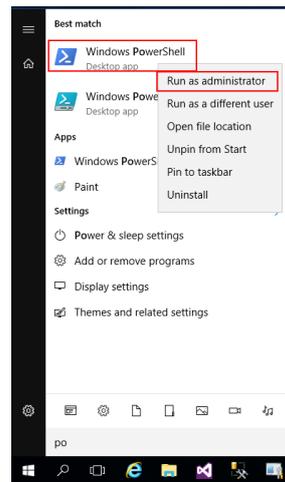
In terms of SQL Server, real-time scanning of the SQL Server data and transaction files (.mdf, .ndf, .ldf, .mdb) can increase disk I/O contention and reduce SQL Server performance. So these should be also excluded from any real-time scanning. In addition, the backup files and transaction logs (*.bak, *.trn) should also be excluded.

If you don't want to completely disable Windows Defender, for some clients this feature can be very important in production environments and they don't want to disable it. Here are some quick PowerShell commands that you can or should use:

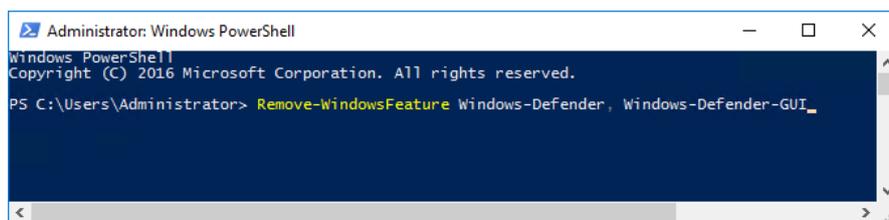
- Turn off Windows Defender Real-Time Protection using PowerShell
 - *Set-MpPreference -DisableRealtimeMonitoring \$true*
- Add a File path exclusion
 - *Set-MpPreference -ExclusionPath "C:\folder1", "C:\folder2"*
- Add process exclusion
 - *Set-MpPreference -ExclusionProcess "service.exe", "program.exe", "process.exe"*

To completely remove the Windows Defender, you should:

- Press the “Windows key” to open the Start menu.
- Type “Windows PowerShell”, right-click in “Windows PowerShell” option and then select “Run as administrator” option.



- On the Windows PowerShell console type the following command:
 - *Remove-WindowsFeature Windows-Defender, Windows-Defender-GUI*



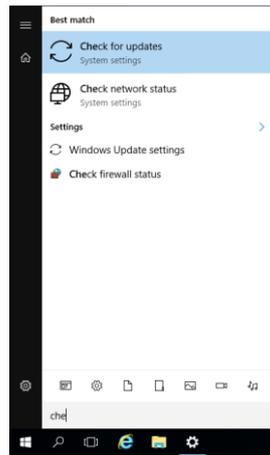
NOTE: You need to restart for changes to take effect.

Install Critical Windows Updates

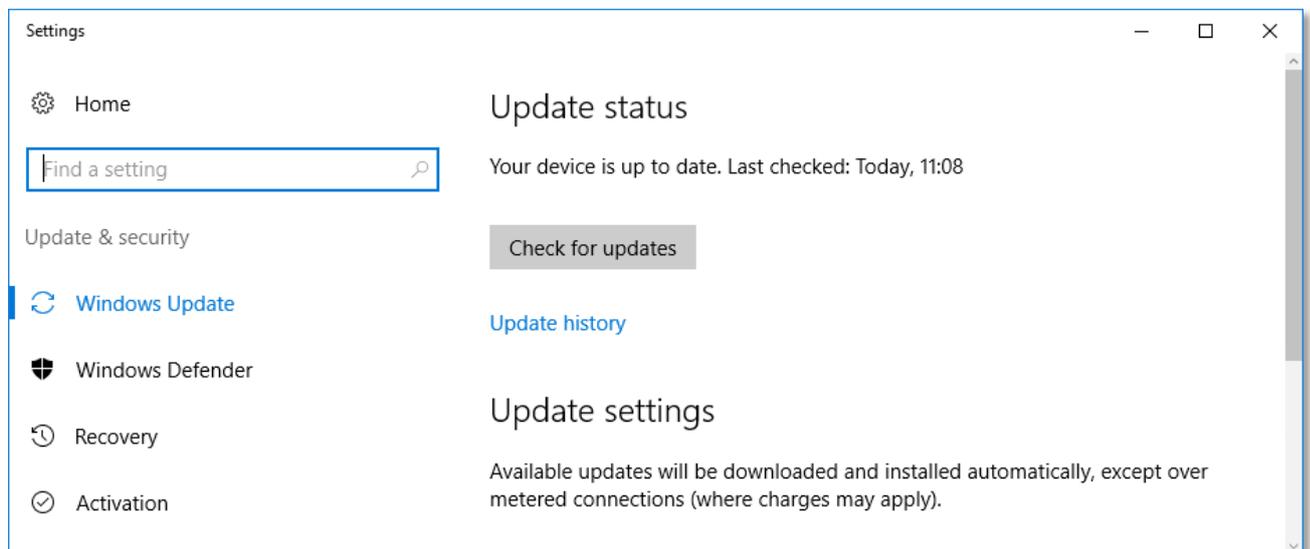
Before installing BizTalk Server or its prerequisites, make sure you have installed the latest critical Windows updates from Microsoft.

To install Windows updates:

- Press the “Windows key” to open the Start menu.
- Type “Windows Update” and click in “Check for Updates” option from the Search window.



- Or press the “Windows key” to open the Start menu, select “Settings” and then select the “Update & security” option
- On the “Update & security” window, click “Check for updates” button and if new updates are available, install them.



If prompted, restart your computer.

4 Preparing and install prerequisites for BizTalk Server 2016

This part of the article will focus on installing the BizTalk prerequisites and perform the necessary configuration on BizTalk Server machine.

Before installing BizTalk Server or its prerequisites, make sure you have installed the latest critical Windows updates from Microsoft.

Important considerations before set up the server

Check if all the considerations described above are implemented:

- Join the Local Administrators Group
- Change the Machine name
- Disable IPv6
- Turn off Internet Explorer Enhanced Security Configuration (optional)
- Disable User Account Control (optional)
- Turn Windows Firewall off (optional)
- Configure the Application Event Log
- Configure Microsoft Distributed Transaction Coordinator (MSDTC)
- Install Critical Windows Updates

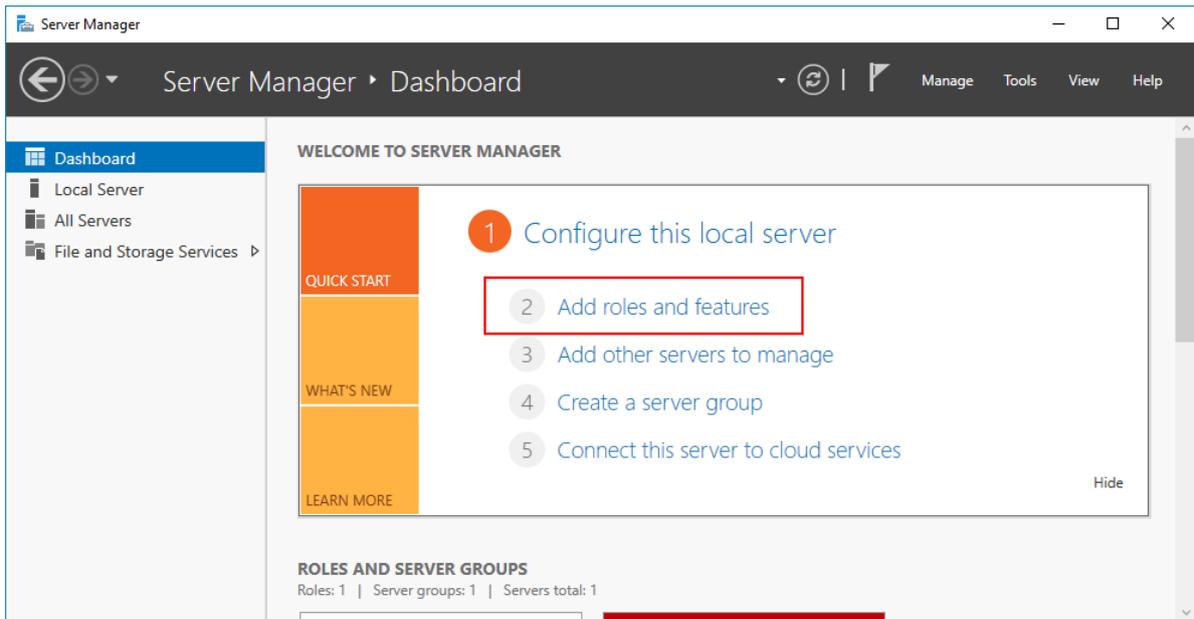
Enable Internet Information Services

Microsoft Internet Information Services (IIS) provides a Web application infrastructure for many BizTalk Server features. BizTalk Server requires IIS for the following features:

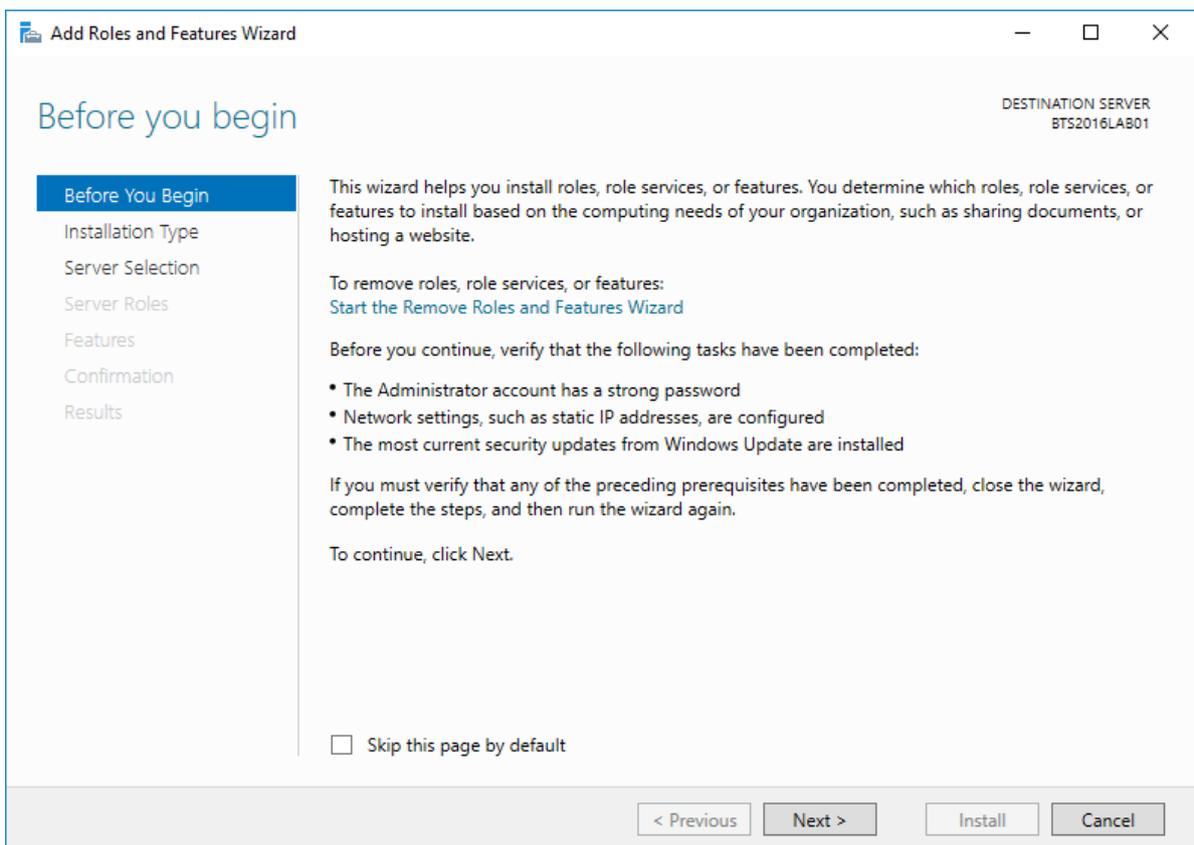
- HTTP adapter
- SOAP adapter
- Windows SharePoint Services adapter
- Secure Sockets Layer (SSL) encryption
- BAM Portal
- EDI
- UDDI

To install IIS 8.5, use the following steps:

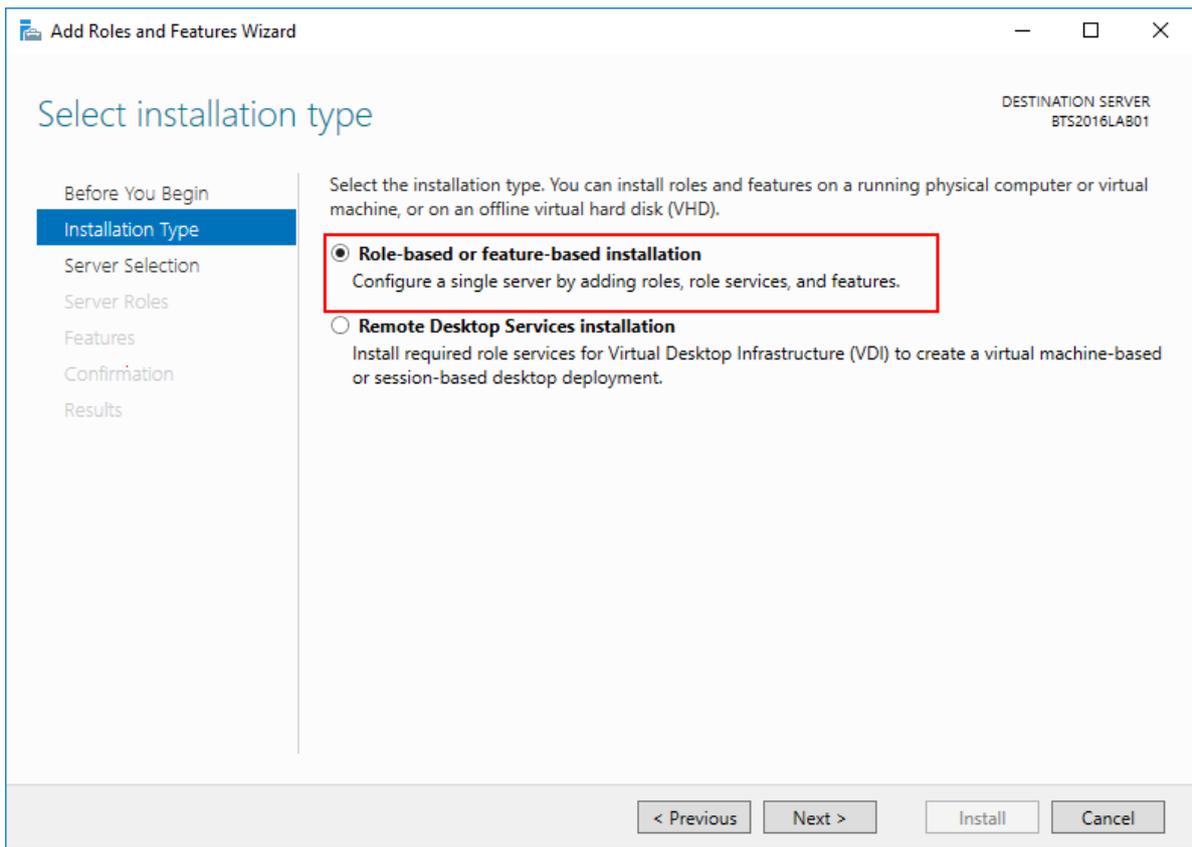
- Start by running the “Server Manager”, if it is not already open, on the Windows Start menu, click the “Server Manager” option.
- Under “Manage” menu, select “Add Roles and Features” (or press “Add roles and features” under the Dashboard panel)



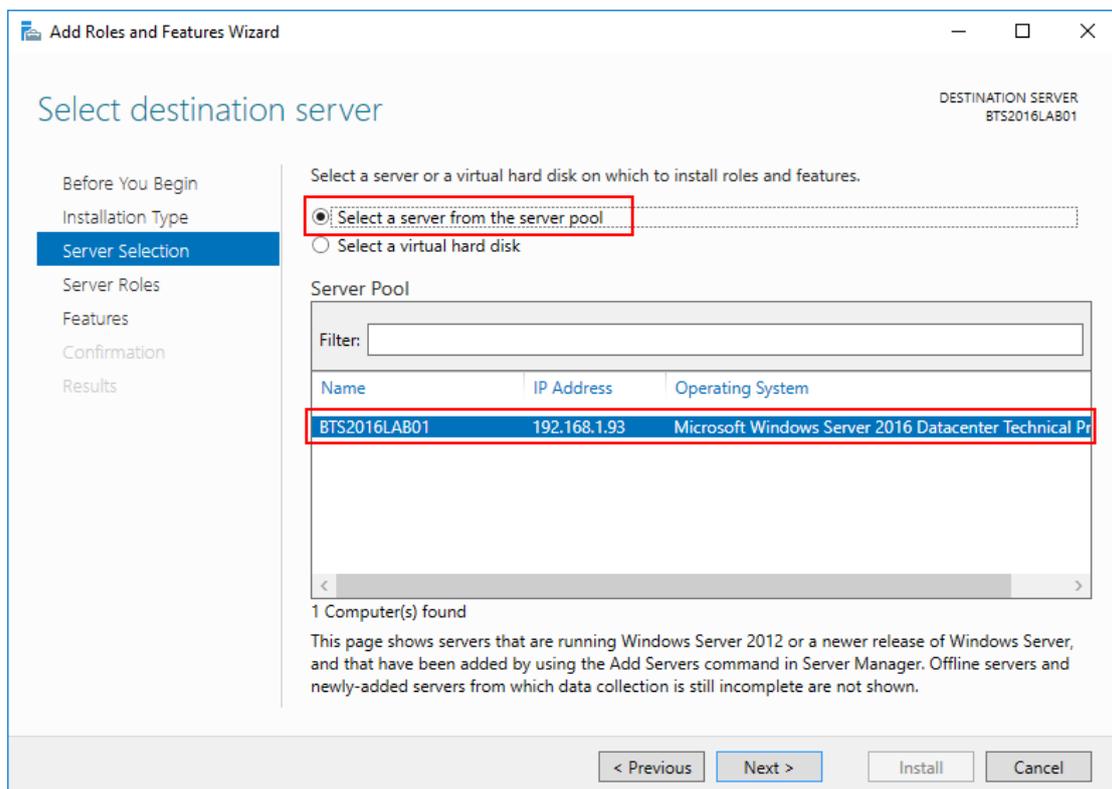
- On the Before You Begin screen, click “Next”



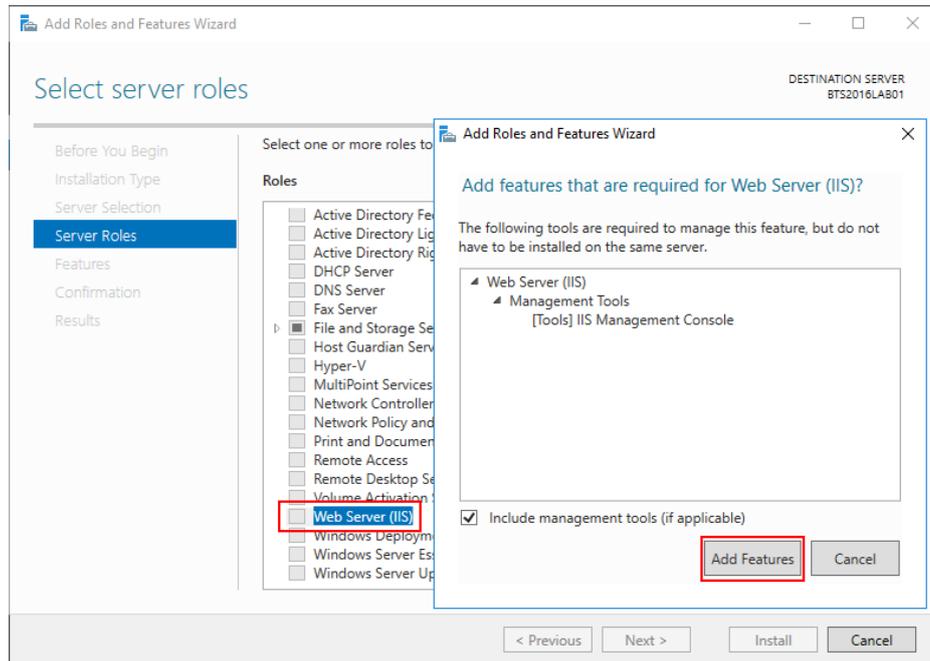
- On the Installation Type screen, select “Role-based or feature-based installation” and click “Next”



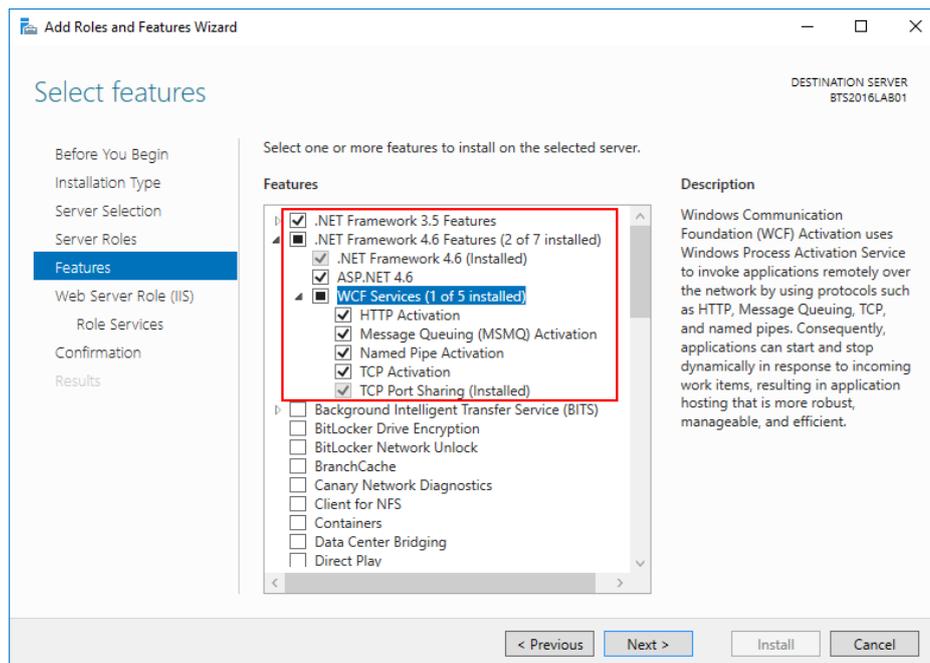
- On the Server Selection screen, select the appropriate server, leave the default options and click "Next"
 - Select a server from the server pool
 - local is selected by default

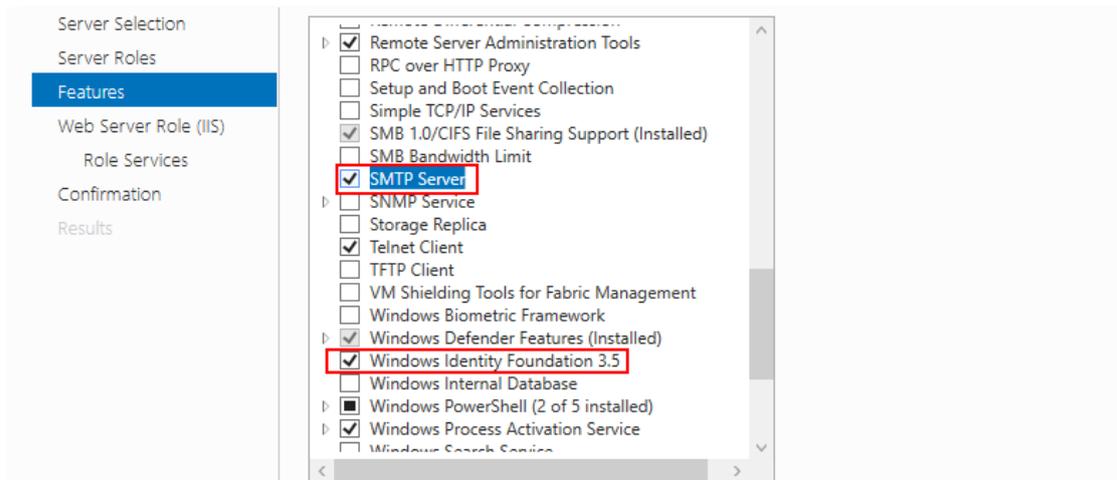


- On the Server Roles screen, select “Web Server (IIS)” option
 - If prompted, click "Add Features", and then click “Next”

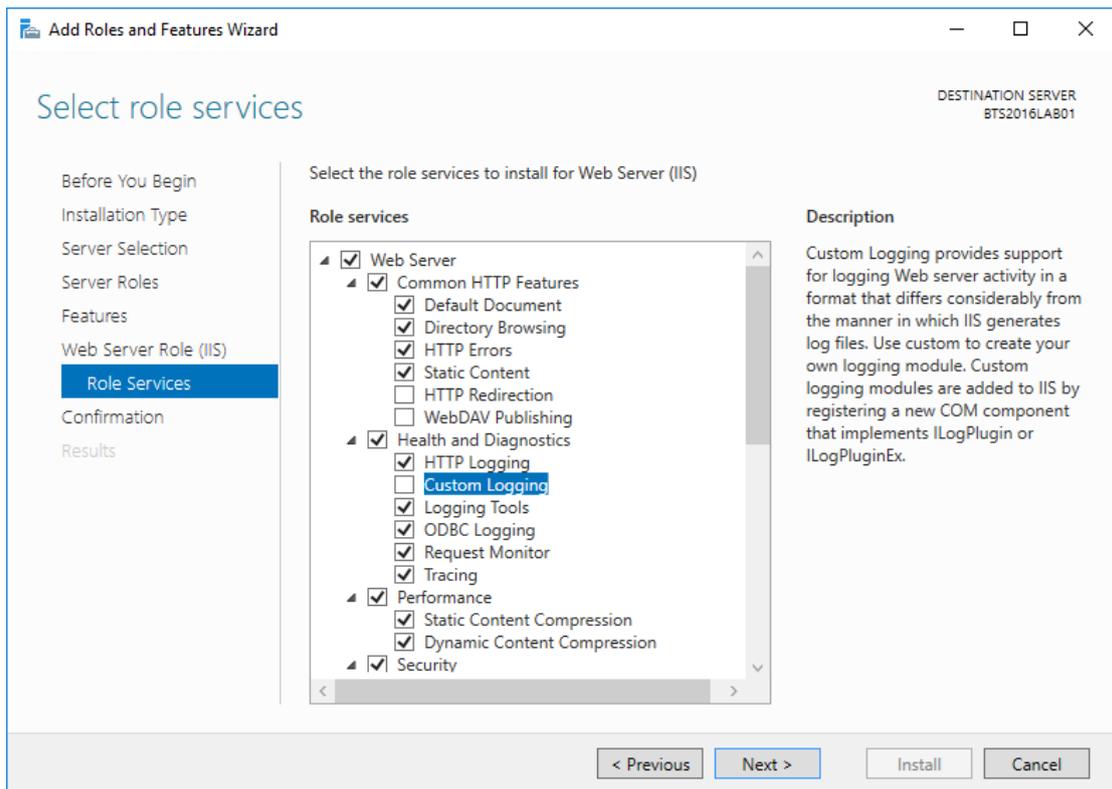


- On the Features screen, no additional features are needed for IIS, however, in addition to the default values, we will need or should select the following options:
 - .NET Framework 3.5 Features
 - .NET Framework 3.5 (includes .NET 2.0 and 3.0)
 - .NET Framework 4.6 Features (If prompted, click "Add Features")
 - SMTP Server (If prompted, click "Add Features") – optional
 - Windows Identity Foundation 3.5 – optional: Windows Identity Foundation (WIF) is required for the SharePoint Services adapter or SharePoint Online when used with SharePoint Services Client Side Object Model (CSOM).

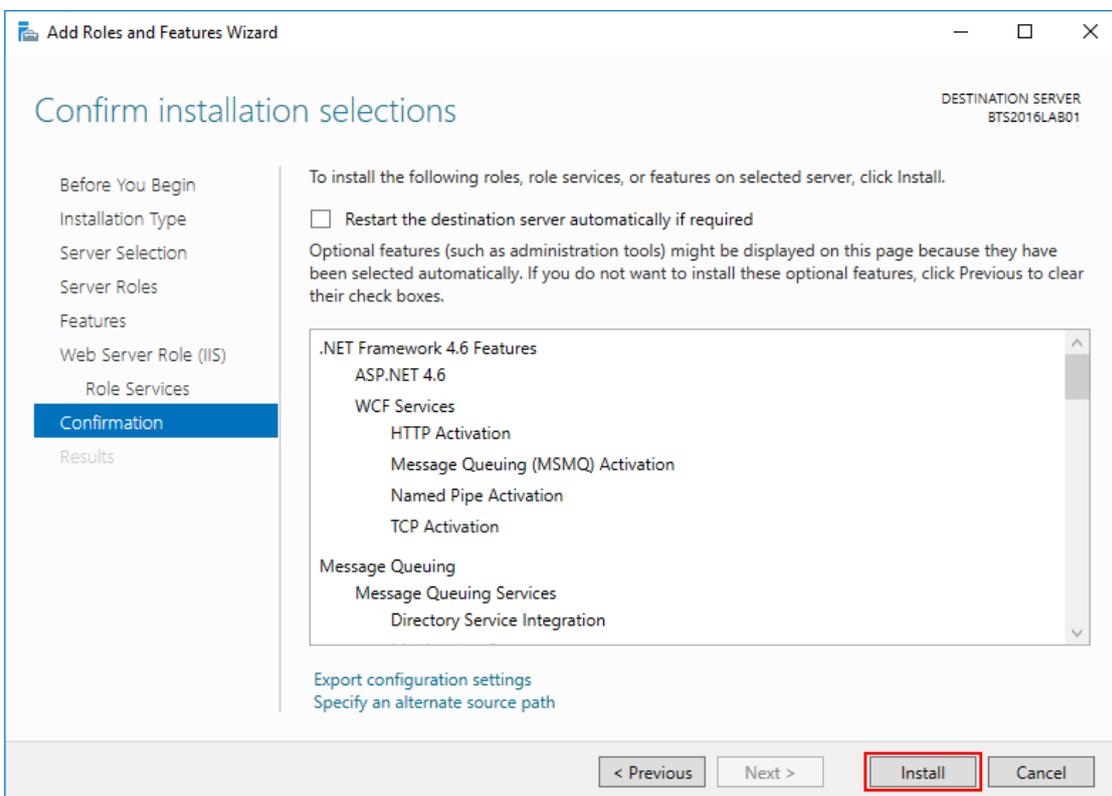




- Then click “Next”
- On the Web Server Role (IIS) screen, click “Next”
- On the Role Services screen under Web Server Role (IIS), we will customize our installation of IIS with the following options:
 - Common HTTP Features
 - Default Document
 - Directory Browsing
 - HTTP Errors
 - Static Content
 - Health and Diagnostics
 - HTTP Logging
 - Logging Tools
 - ODBC Logging
 - Request Monitor
 - Tracing
 - Performance
 - Static Content Compression
 - Dynamic Content Compression
 - Security
 - Request Filtering
 - Basic Authentication
 - Digest Authentication
 - Windows Authentication
 - Application Development
 - Select all options
 - Management Tools
 - IIS Management Console
 - IIS 6 Management Compatibility
 - IIS 6 Metabase Compatibility
 - IIS 6 Management Console
 - IIS 6 Scripting Tools
 - IIS 6 WMI Compatibility



- Then click “Next”
- On the Confirmation screen, click “Install”

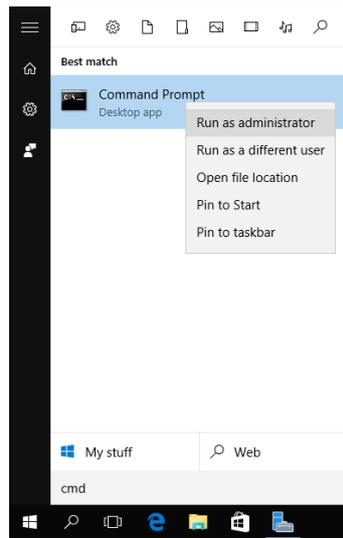


- When the IIS installation completes, the wizard reflects the installation status on the Results screen
- Click “Close” to exit the wizard.

Running the BAM Portal in a 64-bit Environment

BAM Portal runs only runs on a 32-bit mode. If you are using Internet Information Services (IIS) in a 64-bit environment, you must set IIS to 32-bit mode to run the BAM portal. To do this, follow these steps:

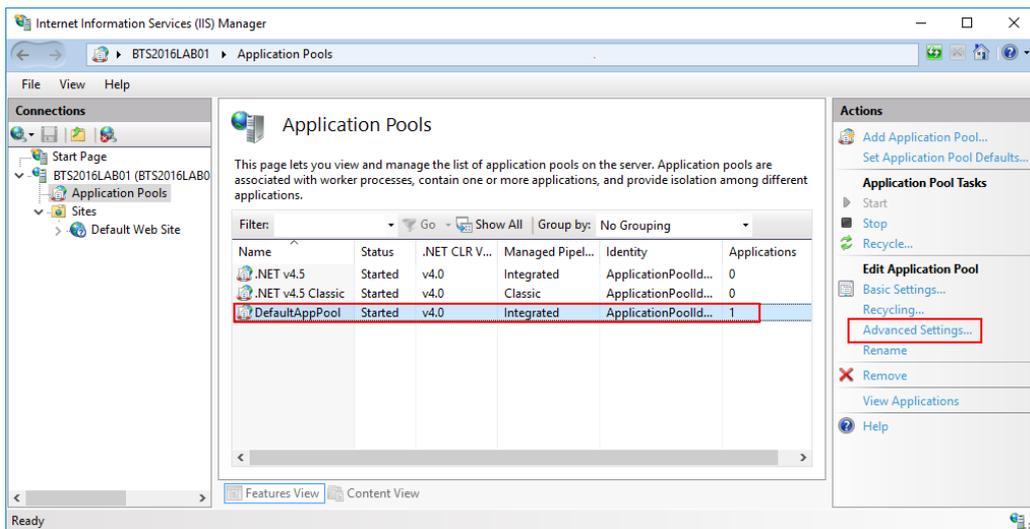
- Open a command prompt as administrator and run the adsutil command. To do this, Press the “Windows key” to open the Start menu and type “cmd” on the Start Search box, right-click in “Command Prompt” and select from the context menu the “Run as administrator” option.



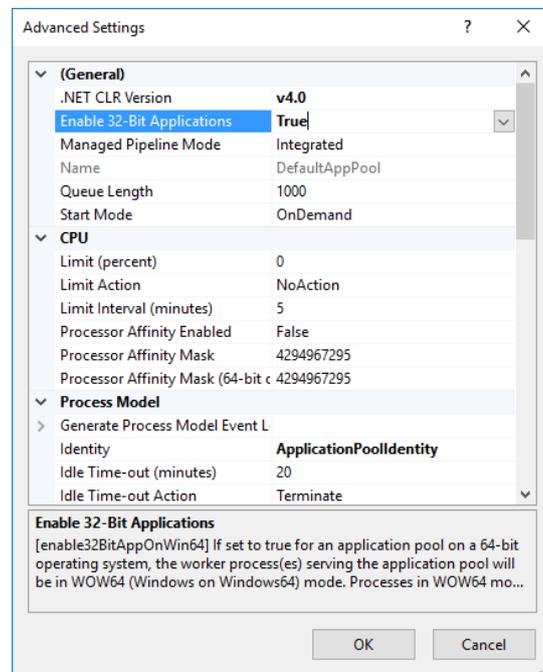
- Type the following at the command prompt:
`cscript c:\inetpub\adminscripts\adsutil.vbs SET W3SVC/AppPools/Enable32bitAppOnWin64 1`
- Close the command prompt.

Or:

- Press the “Windows key” to open the Start menu.
- Type “Internet Information Services (IIS) Manager” or “IIS” and click in “Internet Information Services (IIS) Manager” option on Apps menu.
 - Or type “inetmgr” and click in “inetmgr” to open the IIS management console
- Expand the server and click on “Application Pools” to display available application pools in center panel.
- Right-click on “DefaultAppPool” and select “Advanced Settings”.



- Change the value of 'Enable 32-bit Applications' from False to True. Click "OK".



Install Windows Identity Foundation (WIF)

In the previous step "Enable Internet Information Services" I mentioned that we should install the Windows Identity Foundation 3.5 feature, why?

If we plan to use/configure SharePoint Services adapter or SharePoint Online when used with SharePoint Services Client Side Object Model (CSOM), then Windows Identity Foundation (WIF) feature is required.

WIF is required if you are planning to use:

- SharePoint Services Adapter with CSOM
- SharePoint Online with CSOM

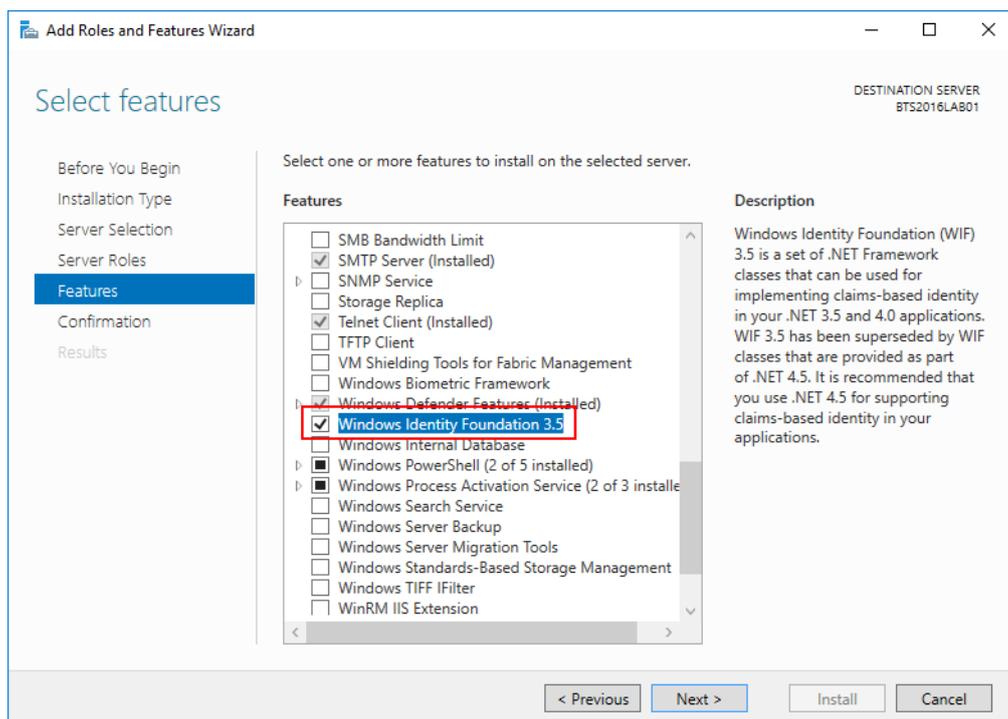
WIF is not required if you are planning to use:

- SharePoint Services Adapter Web Service (deprecated)
- No plan to use SharePoint

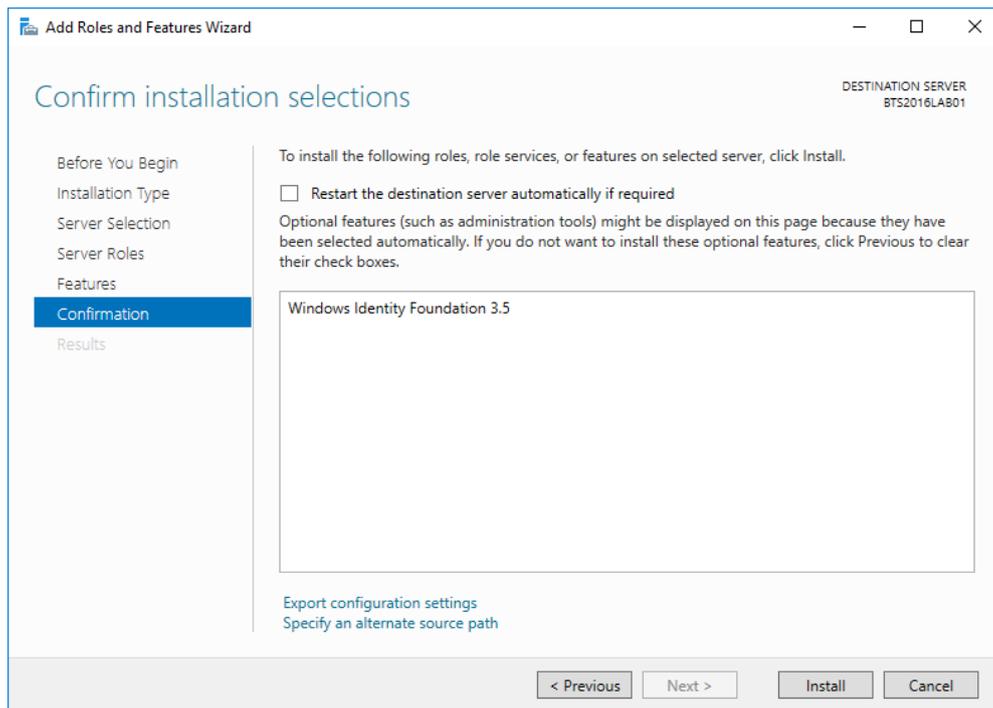
Windows Identity Foundation is included with the operating system (Windows Server 2016, Windows Server 2012 and Windows 8.1) as a Feature in Turn Windows features on or off. (If you plan to use Windows 7 SP1 the download is available here [Windows Identity Foundation](#)):

If you didn't previous install WIF then you should be following this steps:

- Start by running the "Server Manager", if it is not already open, on the Windows Start menu, click the "Server Manager" option.
- Under "Manage" menu, select "Add Roles and Features" (or press "Add roles and features" under the Dashboard panel)
- On the Before You Begin screen, click "Next"
- On the Installation Type screen, select "Role-based or Feature-based Installation" and click "Next"
- On the Server Selection screen, select the appropriate server, leave the default options and click "Next"
- On the Server Roles screen, click "Next"
- On the Features screen, select "Windows Identity Foundation 3.5" and click "Next"



- On the Confirmation screen, select "Restart the destination server automatically if required" and click "Install":



- When the installation completes, the wizard reflects the installation status on the Results screen
- Click “Close” to exit the wizard.

Install and configure SMTP Server Feature (optional)

Again in the previous step “Enable Internet Information Services” I mentioned that we should install the SMTP Server feature, why?

If you wish to configure BAM Alerts, you must have configured SQL Server Database Mail feature (we will see how to accomplish that afterwards) and I will intend to configure this features using your local SMTP Server.

NOTE: This type of configuration is optional and you don’t need to install the local SMTP Server, you can and you should configure SQL Server Database Mail feature using an external SMTP.

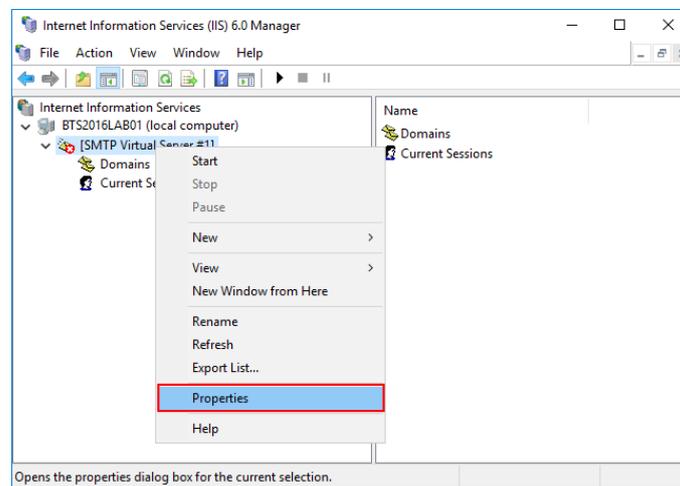
If you didn’t previously install SMTP Server, then you should be following this steps:

- Start by running the “Server Manager”, if it is not already open, on the Windows Start menu, click the “Server Manager” option.
- Under “Manage” menu, select “Add Roles and Features” (or press “Add roles and features” under the Dashboard panel)
- On the Before You Begin screen, click “Next”
- On the Installation Type screen, select “Role-based or Feature-based Installation” and click “Next”
- On the Server Selection screen, select the appropriate server, leave the default options and click “Next”
- On the Server Roles screen, click “Next”
- On the Features screen, select "SMTP Server" and click “Next”
 - If prompted, click "Add Features", and then click “Next”

- On the Confirmation screen, select “Restart the destination server automatically if required” and click “Install”:
- When the installation completes, the wizard reflects the installation status on the Results screen
- Click “Close” to exit the wizard.

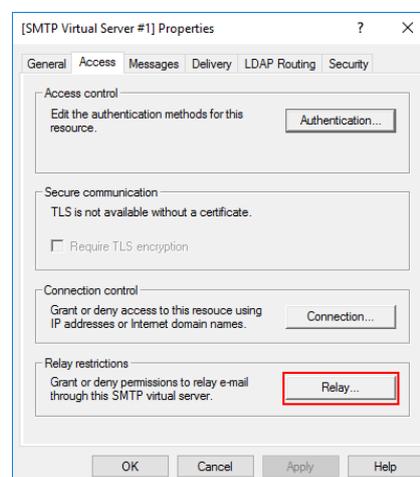
To configure the SMTP Server, you should be following this steps:

- Press the “Windows key” to open the Start menu and type “IIS 6.0 Manager” on the Search window, click in “Internet information Services (IIS) 6.0 Manager” option.
 - Or in the Start menu, select “App apps” options, expand “Window Administrative Tools” and select “Internet information Services (IIS) 6.0 Manager” option
- Right click on the SMTP Server ([SMTP Virtual Server #1]) and select “Properties” to open the properties window

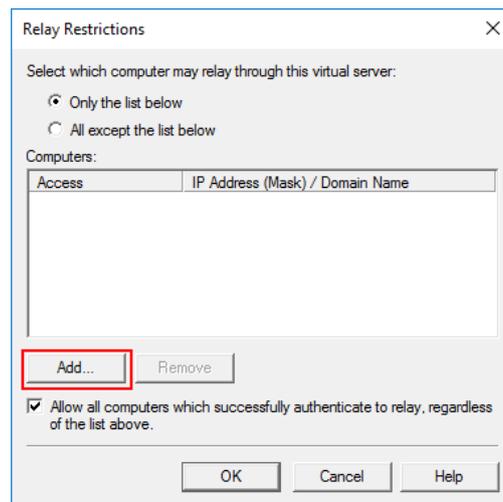


NOTE: For the purpose of this installation, we will assume that email only can be generated from this machine. If the application that generates the email runs on a separate server, you need to grant relaying access for that server in IIS SMTP.

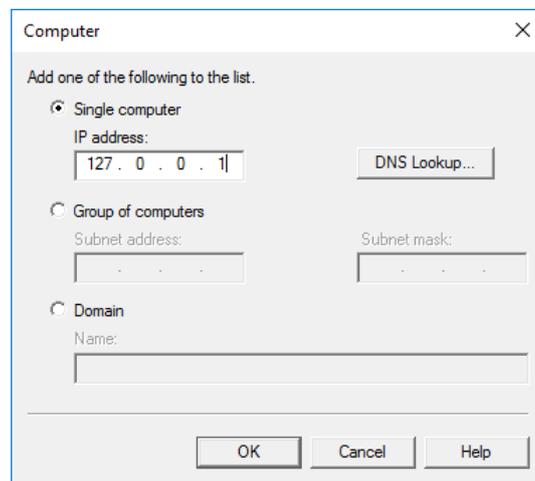
- On the Properties windows, click on the “Access” tab and click “Relay...” under “Relay restrictions”



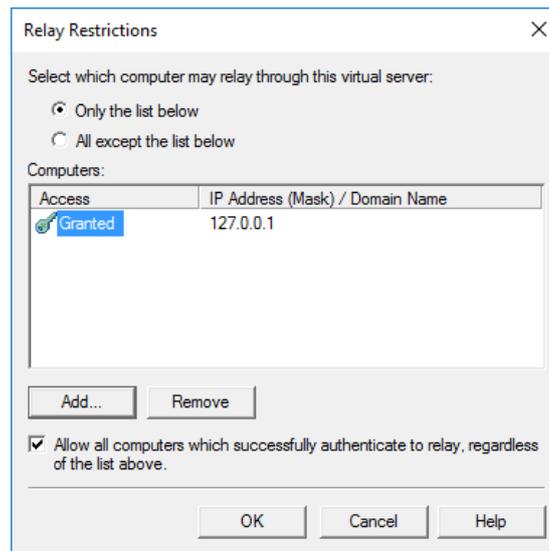
- On Relay Restrictions windows, click” Add...”



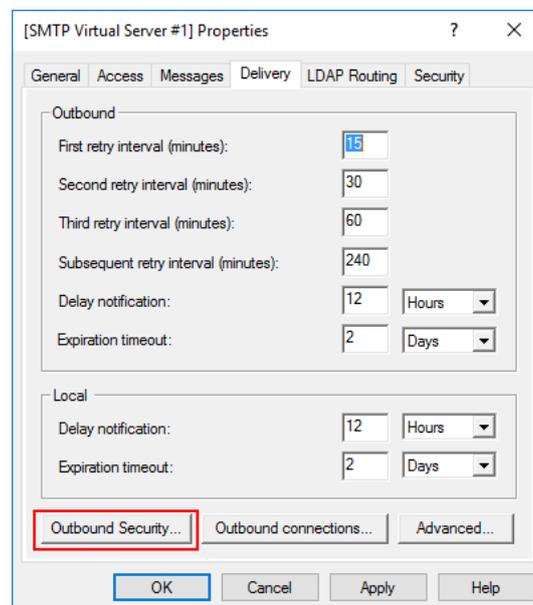
- On Computer window, enter 127.0.0.1 for the address and then click “OK”



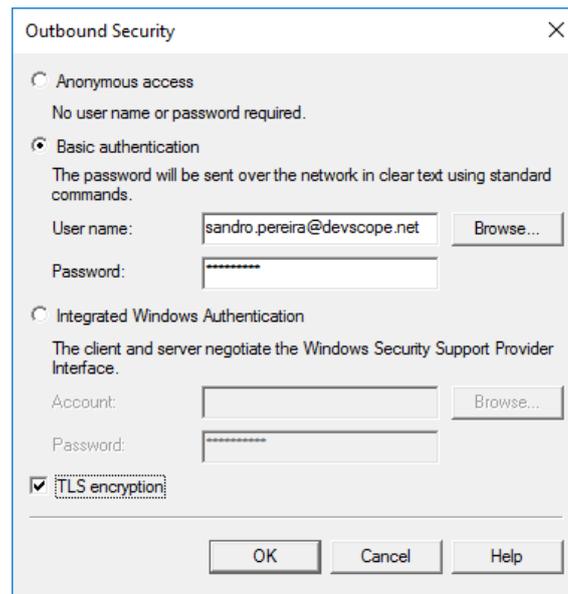
- The Connection setting controls which computers can connect to the SMTP server and send mail. By granting only localhost (127.0.0.1), only the server itself has the ability to connect to the SMTP server. This is a requirement for security, it prevents the SMTP server from being an open relay and being used to send unsolicited spam email by other computers on the internet, which could lead to the SMTP server being blacklisted.



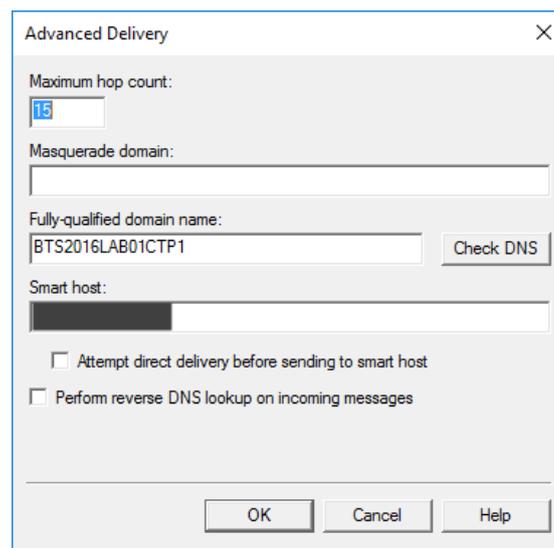
- On the Properties windows, click on the “Delivery” tab and click “Outbound Security...”



- On the Outbound Security windows, select “Basic authentication” and enter the login credentials you use for your Exchange or personal account (Gmail, Live and so on). Click “OK” to continue.
 - If required, enable “TLS encryption”
 - This will be the account that will transmit the emails.

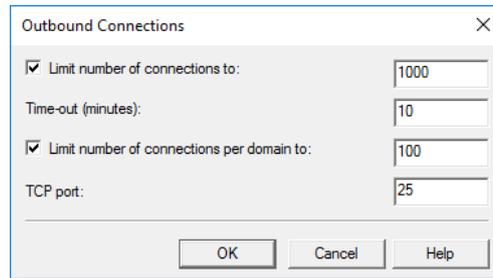


- On the Outbound Security windows, click “Advanced...”. Enter the SMTP server URL you got in the previous step in the Smart host edit box and then click “OK” to continue.



- On the Outbound Security windows, click on “Outgoing connections...” and set the port of your server
 - Limit number of connections to: When the check box is selected, this option specifies the total number of simultaneous outbound connections to all remote domains that can exist at one time. The default is 1,000 connections. The minimum is 1.
 - Time-out (minutes): Specifies the time allowed before an inactive connection is closed. The default is 10 minutes.
 - Limit number of connections per domain to: When the check box is selected, this option limits connections to any single remote domain. The default is 100 connections. This number should be less than or equal to the value for the Limit number of connections to option.

- TCP port: Designates the TCP port used for outgoing transmissions. The default is port 25. The outgoing port setting can be the same as that for incoming transmissions or it can be different.



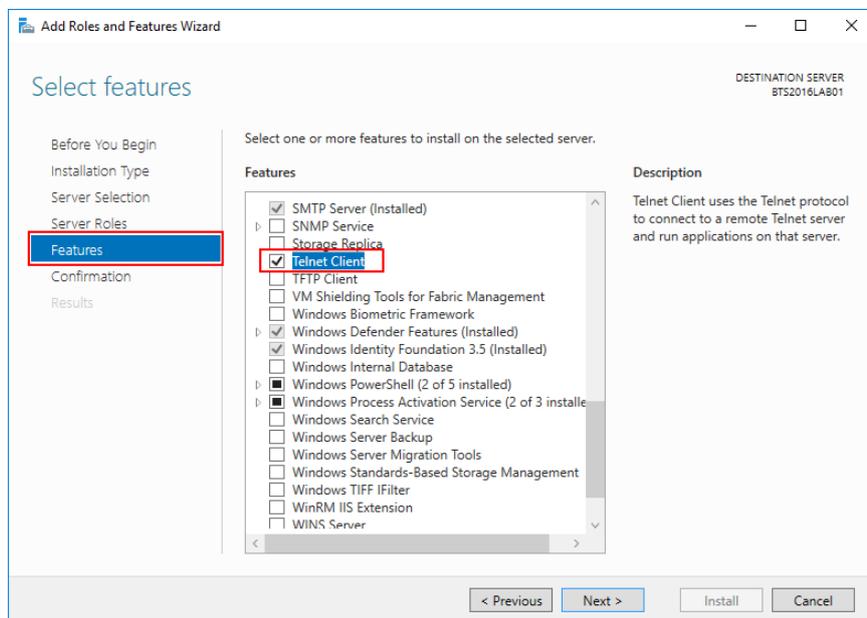
- Click “Ok” twice to apply the settings on the SMTP local server
- Right-click SMTP Virtual Server #1 again, and then restart the service to pick up the new configuration.

Verify Your Installation

The next step is to verify if the SMTP is successful configured by using the simple Telnet Client.

If you don't have Telnet Client installed, then you need to:

- Start by running the “Server Manager”, if it is not already open, on the Windows Start menu, click the “Server Manager” option.
- Under “Manage” menu, select “Add Roles and Features” (or press “Add roles and features” under the Dashboard panel)
- In the Features section, select Telnet Client, and then click “Next”.



- On the Confirm Installation Options page, click “Install”.
- When installation finishes, on the Installation Results page, click “Close”.

To send a test email:

- Open a command prompt window by pressing the “Windows key” to switch to the Start menu, type “cmd” and then click in “Command Prompt” option from the Search window.
- Type the following sequence of command:

```
telnet localhost 25
HELO server
mail from:email
rcpt to:email
data
put the body of the email message
.
```

```
Telnet localhost
Microsoft ESMTPL MAIL Service, Version: 10.0.10586.0 ready at Tue, 5 Apr 2016 15:57:50 +0100
HELO server
250      Hello [127.0.0.1]
mail from: sandro.pereira@devscope.net
250 2.1.0 sandro.pereira@devscope.net...Sender OK

rcpt to:sandro.pereira@devscope.net
250 2.1.5 sandro.pereira@devscope.net
data
354 Start mail input; end with <CRLF>.<CRLF>
hello im you.
.
250 2.6.0 <BTS2016LAB01n0FU6rE00000001@>      Queued mail for delivery
```

Install Microsoft Office Excel 2016

Microsoft Office Excel is required for using the Business Activity Monitoring (BAM) feature in BizTalk Server. You will use the BAM Office Excel Workbook to define the business processes you want to monitor and you will also use the BAM Excel Workbook to define the way in which business users see the data collected by BAM.

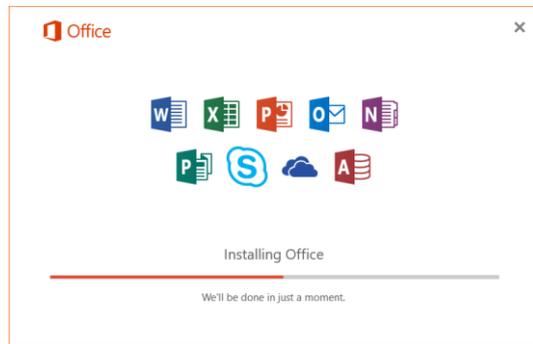
IMPORTANT NOTE: BizTalk Server 2016 supports only 32-bit version of Microsoft Office.

The following procedure installs only Microsoft Office Excel. You can install additional Microsoft Office system applications and tools if you wish, but they are not necessary to complete the installation of BizTalk Server.

IMPORTANT NOTE: To successfully load BAM.xla into Excel, you will need to install the “**VISUAL BASIC FOR APPLICATIONS**” option under “**OFFICE SHARED FEATURES**”. Otherwise, you may get the error “This workbook has lost its VBA project, ActiveX controls and any other programmability-related features.”

In previous Office versions, such as Office 2010 or 2013, Microsoft used to provide traditional MSI (Windows Installer) that allowed Office users to select, at the time of installation, the desired Office programs available in the Office suite so that the Office setup wizard installs only selected programs on their computers or servers. However, with Office 2016 version, Microsoft has started using a new virtualization technology called “Click-to-Run” or “C2R Installer” to distribute Office setup and installation files.

The limitation in this new installer technology is that it doesn't allow you to select, at the time of installation, the desired Office programs we want to install, instead, the installer downloads and installs all the Office programs in the Office suite.



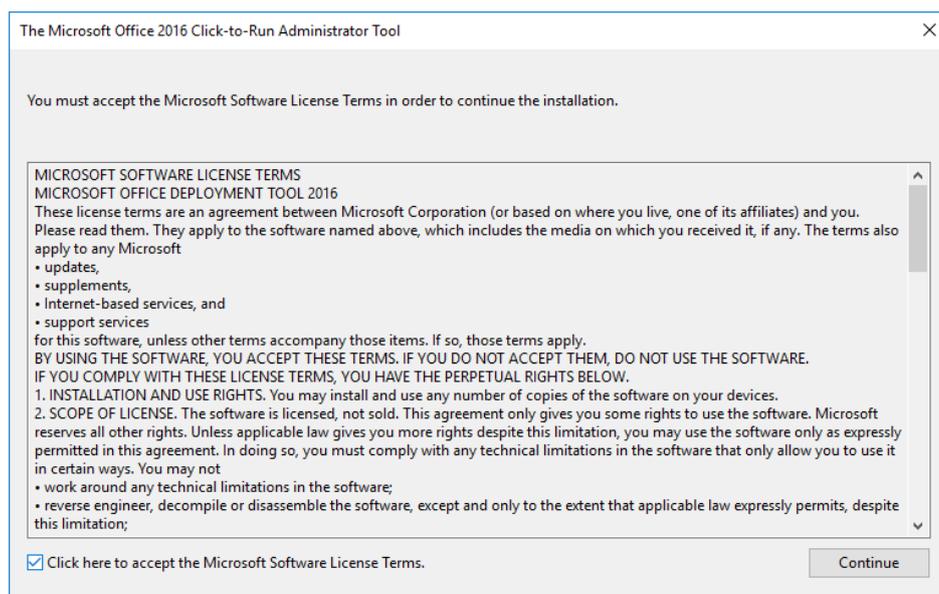
For a BizTalk Server environment, we don't want to have the entire Office suite installed in our server, instead, we only want to install the Excel 2016. Fortunately, Microsoft provides a separate official tool called "[Office 2016 Deployment Tool](#)" for us to be able to customize the "Click-to-Run" installer options so that you can force the installer to install only the desired Office programs.

With the help of this tool, you can download Office setup files at your desired location and then configure the installer to install your selected Office apps only. You can also select which language should be installed and also customize lots of setup options.

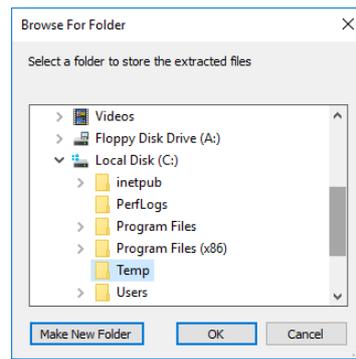
Installing and configuring Office 2016 Deployment Tool

Once you downloaded "[Office 2016 Deployment Tool](#)", run it:

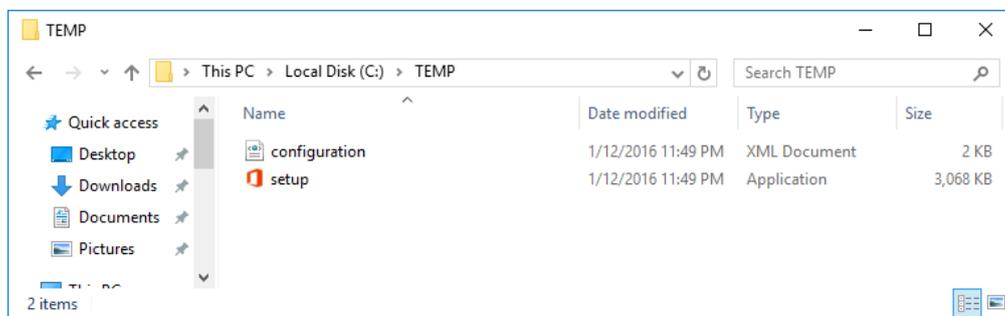
- On the License page, accept the license agreement by selecting "Click here to accept the Microsoft Software License terms" and then click "Continue".



- The installer will ask you to select a folder to extract the files. Select any desired folder



- and it'll extract following 2 files in that folder:
 - **configuration.xml**: this XML file will be used to provide all required information to force the installer to install only selected Office programs with predefined things. You can consider this XML file as an automatic answer file which is used in unattended software installations.
 - **setup.exe**



NOTE: You can download Office setup files using the Office 2016 Deployment Tool setup.exe file or you can use the Office 2016 ISO file that you might have downloaded previously.

Installing Microsoft Office Excel 2016

To install Microsoft Office Excel:

- Open the container folder in which you extract the Office 2016 Deployment Tool and open the "configuration.xml" file with an editor of your choice, for example: notepad.
- Replace the content of the file with the following configuration:

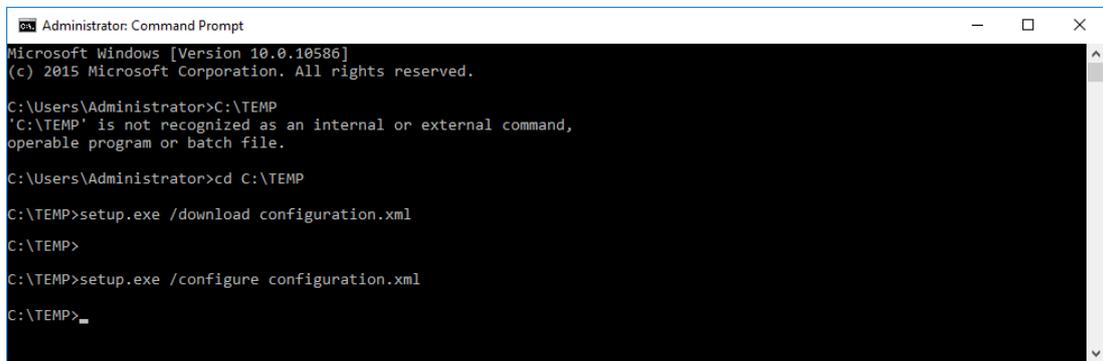
```
<Configuration>
  <Add SourcePath="D:\" OfficeClientEdition="32">
    <Product ID="0365ProPlusRetail" >
      <Language ID="en-us" />
      <ExcludeApp ID="Access" />
      <ExcludeApp ID="Groove" />
      <ExcludeApp ID="InfoPath" />
      <ExcludeApp ID="Lync" />
      <ExcludeApp ID="OneDrive" />
      <ExcludeApp ID="OneNote" />
      <ExcludeApp ID="Outlook" />
      <ExcludeApp ID="PowerPoint" />
      <ExcludeApp ID="Project" />
      <ExcludeApp ID="Publisher" />
      <ExcludeApp ID="SharePointDesigner" />
      <ExcludeApp ID="Visio" />
    </Product>
  </Add>
</Configuration>
```

```

    <ExcludeApp ID="Word" />
  </Product>
</Add>
</Configuration>

```

- Where "SourcePath" is the path to the driver with the Office 2016 ISO file attached or the path to where you want to download the Office programs to be installed afterward's.
- Open the folder containing setup.exe and configuration.xml files in a command windows by pressing and holding the SHIFT key on your keyboard, then right-click on empty area in the folder and select the option "Open command window here".
 - This will open Command Prompt window with the current directory active.
- Finally, to install the Office Excel 2016, you just need to type following command in Command Prompt and press Enter:
 - **setup.exe /configure configuration.xml**
 - **NOTE:** you will also have the option "**setup.exe /download configuration.xml**" to download the required office setup files.



```

Administrator: Command Prompt
Microsoft Windows [Version 10.0.10586]
(c) 2015 Microsoft Corporation. All rights reserved.

C:\Users\Administrator>C:\TEMP
'C:\TEMP' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\Administrator>cd C:\TEMP

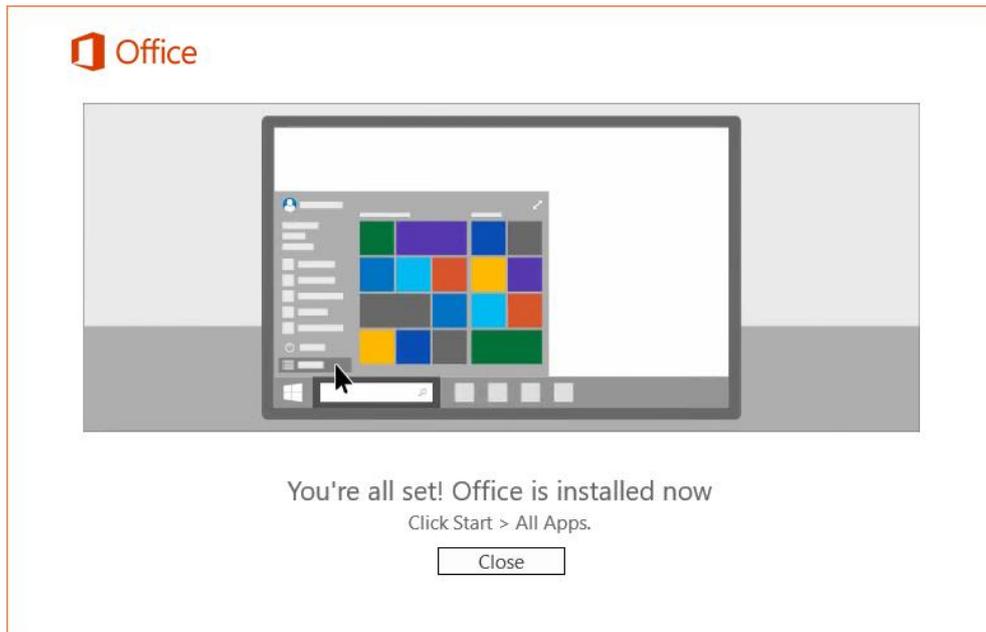
C:\TEMP>setup.exe /download configuration.xml
C:\TEMP>
C:\TEMP>setup.exe /configure configuration.xml
C:\TEMP>_

```

- This will automatically open an Office installation windows



- On the Office Setup Completed screen, click "Close".



Reference for Click-to-Run configuration.xml file: [https://technet.microsoft.com/en-us/library/jj219426\(v=office.15\)#BKMK_C2RConfigxmlFormat](https://technet.microsoft.com/en-us/library/jj219426(v=office.15)#BKMK_C2RConfigxmlFormat)

After installing Office Excel and tools I like to do a Windows update, this step is not necessary.

Install Visual Studio 2015

The BizTalk Server development tools are based on Visual Studio and it provides a development environment for building BizTalk Server applications. **Enterprise Edition is recommended, but Professional and Community editions are also supported.** Like previous versions of the product, at a minimum, you must have the Microsoft Visual C#® .NET component of Visual Studio installed on your computer if you wish to install the BizTalk Server Developer Tools and SDK component. However, like the previous versions of Visual Studio (VS 2012) with Visual Studio 2015 you cannot customize the features that you want to install to the point of only install Visual C#, at least that I know of.

NOTE: Visual Studio 2015 is not required if you are installing BizTalk Server on a production environment (runtime only), on which it is not required to do application development and/or application debugging.

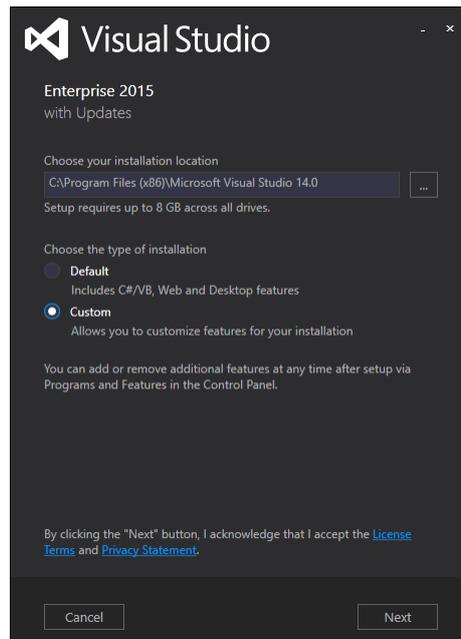
IMPORTANT NOTE: The BizTalk Server runtime components require .NET Framework 4.6. In addition, the .NET Framework 3.0 is required if the Windows Communication Foundation (WCF) adapter or WCF Interceptor are planned to be installed.

ADDITIONAL NOTE: If you install Visual Studio before installing BizTalk Server, and then upgrade to Visual Studio Team Explorer, you may need to repair your BizTalk Server installation from the Control Panel / Programs option.

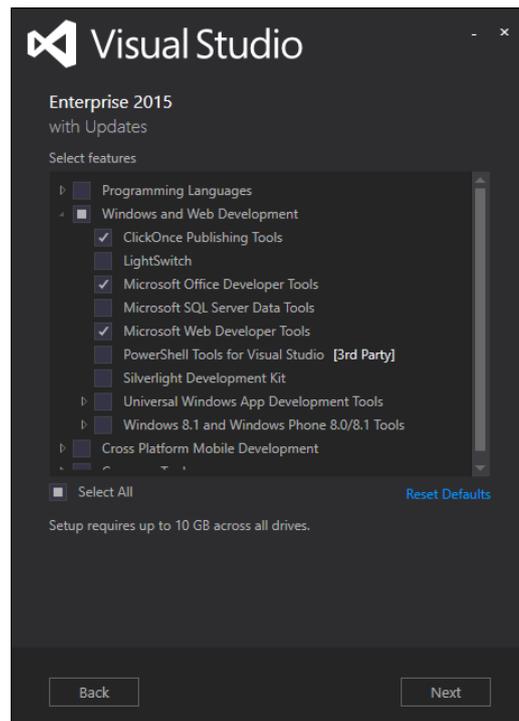
To install Visual Studio 2015:

- Insert the Visual Studio 2015 installation disk into the DVD-ROM drive.

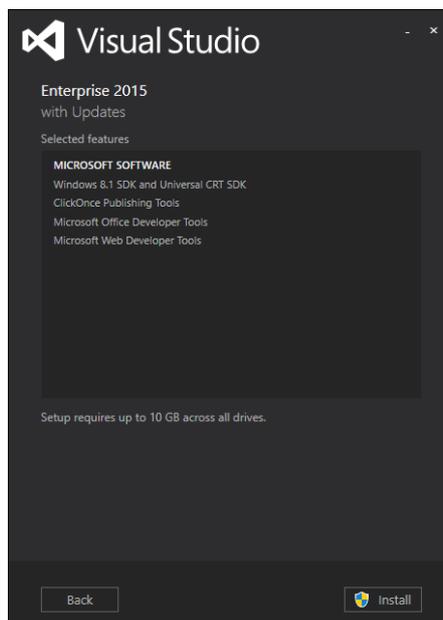
- On the Start page, set the path in which you want to install the Visual Studio and the type of installation that you want to perform: “Default” or “Custom” and then then click “Next”.
 - When you install Visual Studio 2015, you can include or exclude components that you'd use on a daily basis. This means that a Default installation will often be smaller and install faster than a Custom installation. It also means that many components that were installed by default in previous versions now are considered Custom components that you must explicitly select in this version.
 - In our case we choose “Custom”



- In the Select features window, select the options you need and then select Install. BizTalk Server does not require any of the optional features. However, sometimes it is important to install at least some of the “Microsoft Web Developer Tools” options. Add the following features to your installation:
 - Microsoft Web Developer Tools
 - Microsoft Office Developer Tools (not required)
 - PowerShell Tools for Visual Studio (not required)
 - ClickOnce Publishing Tools (not required)



- And then click “Next”
- In the Select features resume window, confirm if everything is correct in terms of features to install and then click “Install”



- On the Finish page, close the window or click “Launch”.



IMPORTANT NOTE: Because we cannot fully customize the Visual Studio 2015 installation, your version of Visual Studio **WILL INCLUDE MICROSOFT SQL SERVER EXPRESS OR COMPACT** as an optional feature that will be automatically installed. **This feature is not used by BizTalk Server and may cause BizTalk Server setup to fail or cause some further problems.** As a best practice, uninstall Microsoft SQL Server Express or/and Compact.

Remove Microsoft SQL Server Express

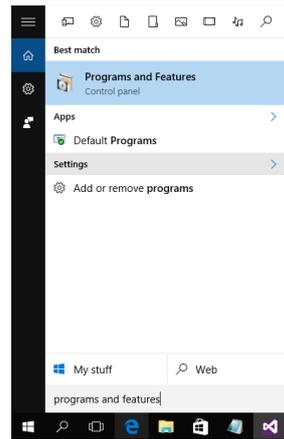
As I said previously your version of Visual Studio **WILL INCLUDE MICROSOFT SQL SERVER EXPRESS OR COMPACT AS** an optional feature that will be automatically installed. This feature may cause BizTalk Server setup to fail and should not be installed but as we cannot customize the Visual Studio 2015 installation, so it's very important that we remove this features.

To avoid futures complications, I choose to uninstall this two features:

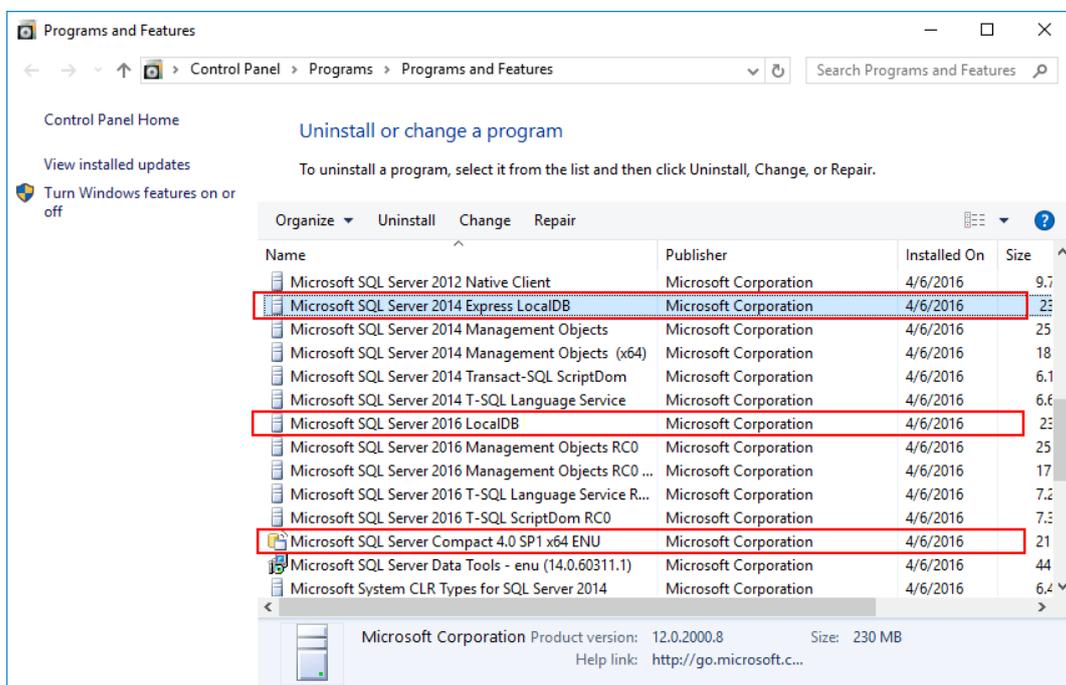
- Microsoft SQL Server 2014 Express LocalBd
- Microsoft SQL Server Compact 4.0 SP1 x64 ENU: Microsoft SQL Server Compact 4.0 is a free, embedded database that software developers can use for building ASP.NET websites and Windows desktop applications. SQL Server Compact 4.0 has a small footprint and supports private deployment of its binaries within the application folder, easy application development in Visual Studio and WebMatrix, and seamless migration of schema and data to SQL Server

To uninstall these features:

- Press the “Windows key” to open the Start menu.
- Type “Programs and Features” and click in “Programs and Features” option from the Search window.



- Or press the “Windows key” to open the Start menu, and then click “Control Panel”.
- In the “Control Panel” window, click “Programs > Programs and Features”.
- Select “Microsoft SQL Server 2014 Express LocalBd” and click “Uninstall”.



- Repeat the process, select “Microsoft SQL Server Compact 4.0 SP1 x64 ENU” and click “Uninstall”.
- Repeat the process, select “Microsoft SQL Server 2016 LocalDB” (SQL Server 2016 Express LocalDB) and click “Uninstall”.

Install SQL Server 2016

BizTalk Server provides the capability to specify a business process and also a mechanism by which the applications used in that business process can communicate with each other. SQL Server is the main repository for this communication mechanism. For optimal performance, Microsoft recommends using the Enterprise Edition of SQL Server.

NOTE: Using SQL Server Express Edition is not recommended nor supported. The Express

edition does not include certain features needed by BizTalk Server.

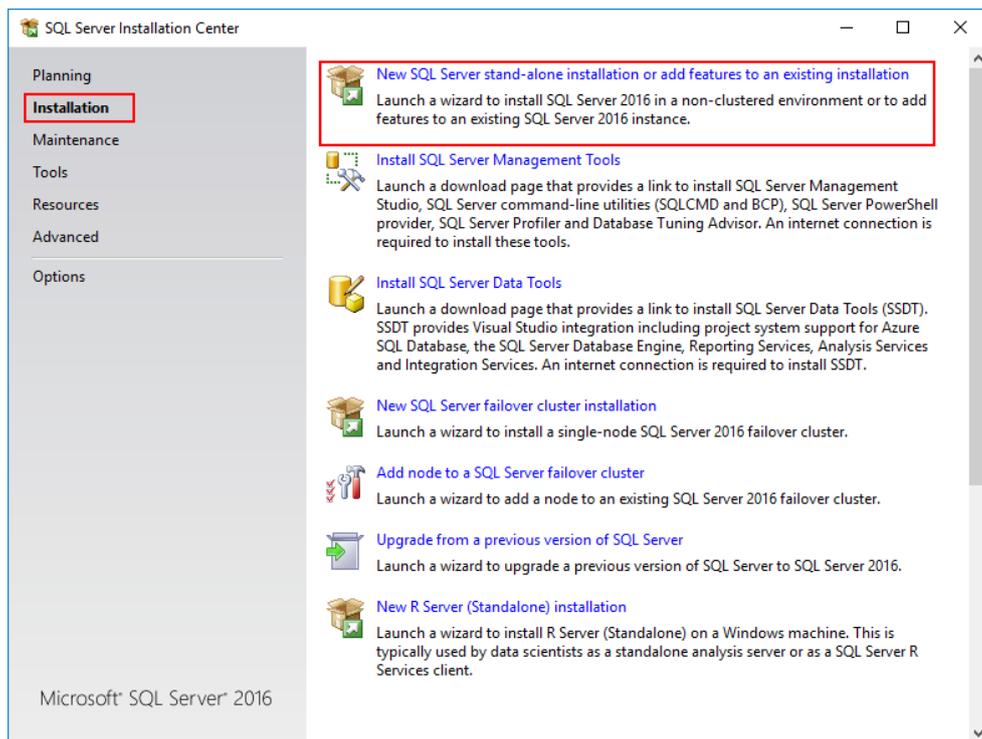
NOTE: BizTalk Server supports SQL Standard Edition version. However, to use Business Activity Monitoring real-time aggregation (BAM RTA), you must install SQL Server Enterprise Edition because BAM real-time aggregation (RTA) is not supported in the Standard Edition of SQL Server.

NOTE: To fully use the BizTalk Server SDK or deploy BizTalk Server applications from a Visual Studio, you should install the SQL Server Development Tools

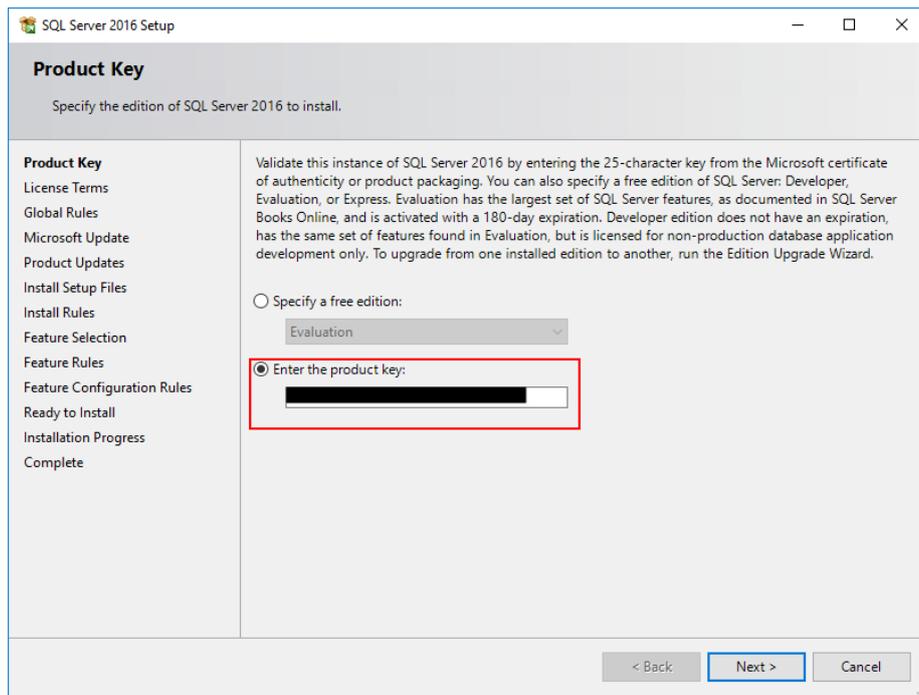
NOTE: BizTalk Server supports all case-sensitive and case-insensitive SQL Server collations except for binary collations. Binary collations are not supported.

To install SQL Server 2016:

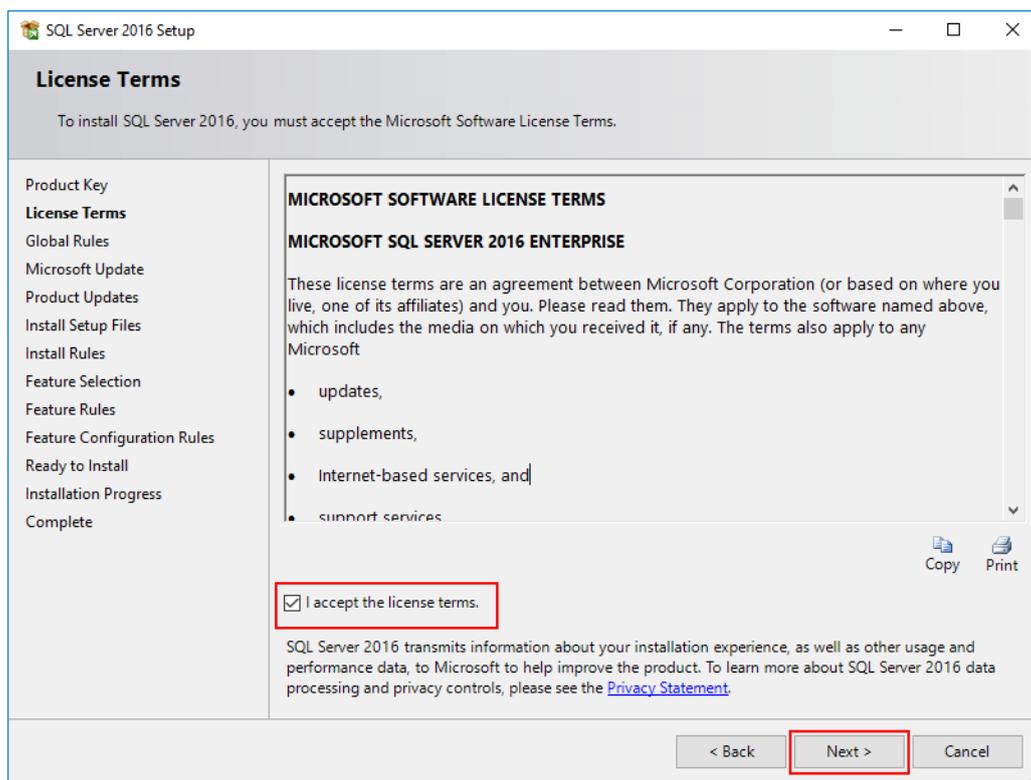
- Insert the SQL Server installation disk into the DVD-ROM drive. The setup program will begin automatically. If prompted for automatic installation of prerequisite software, click “OK”
- On the SQL Server Installation Center, click “Installation” and then click “New SQL Server stand-alone or add features to an existing installation”



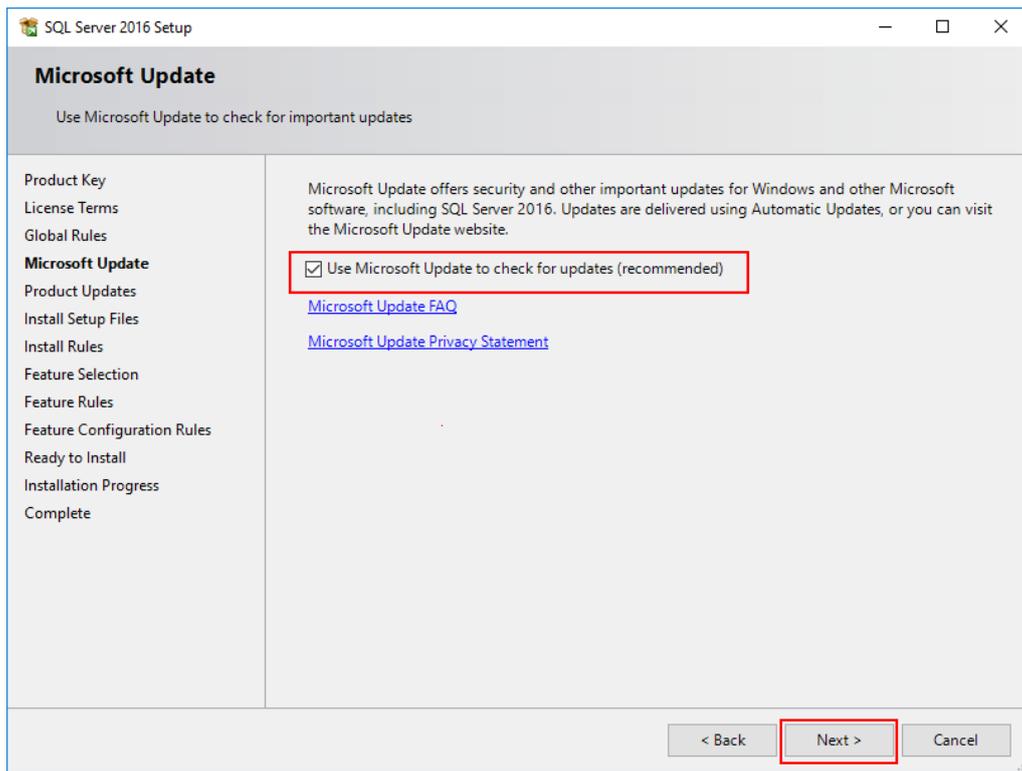
- On the Product Key page, enter your product key and click “Next”



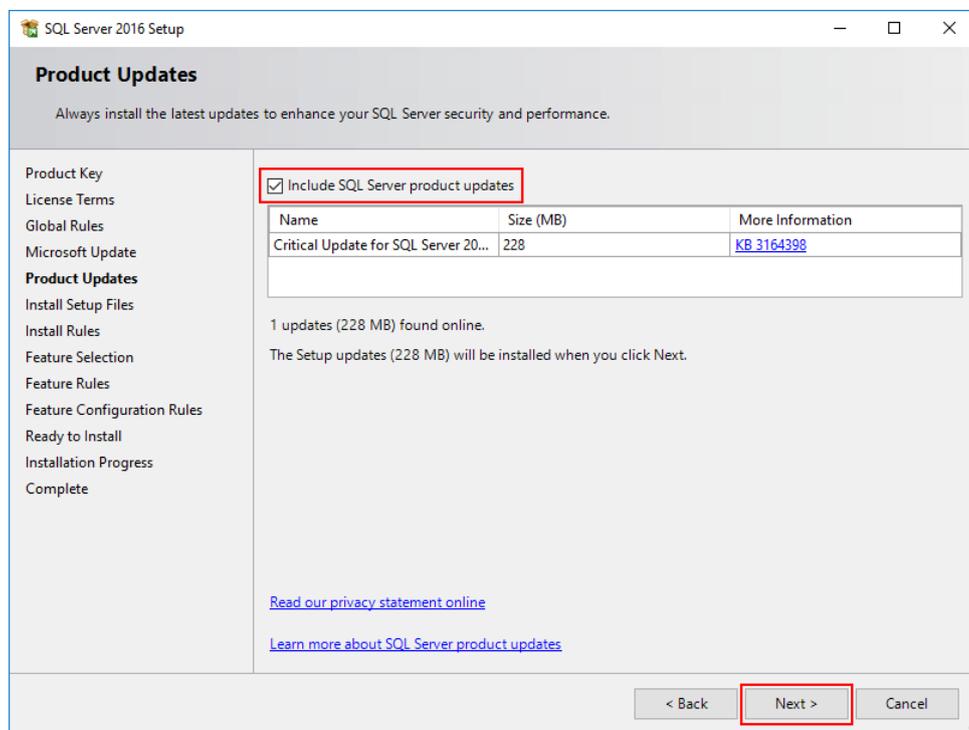
- On the License Terms page, select “I accept the license terms”, and then click “Next” to continue.



- In the Global Rules page, the setup procedure will automatically advance to the Product Updates window if there are no rule errors. Otherwise review the information and resolve any issues, and then click “Next” to continue.
- On the Microsoft Update page, select “Use Microsoft Update to check for updates (recommended)” check box and then click “Next” to continue.

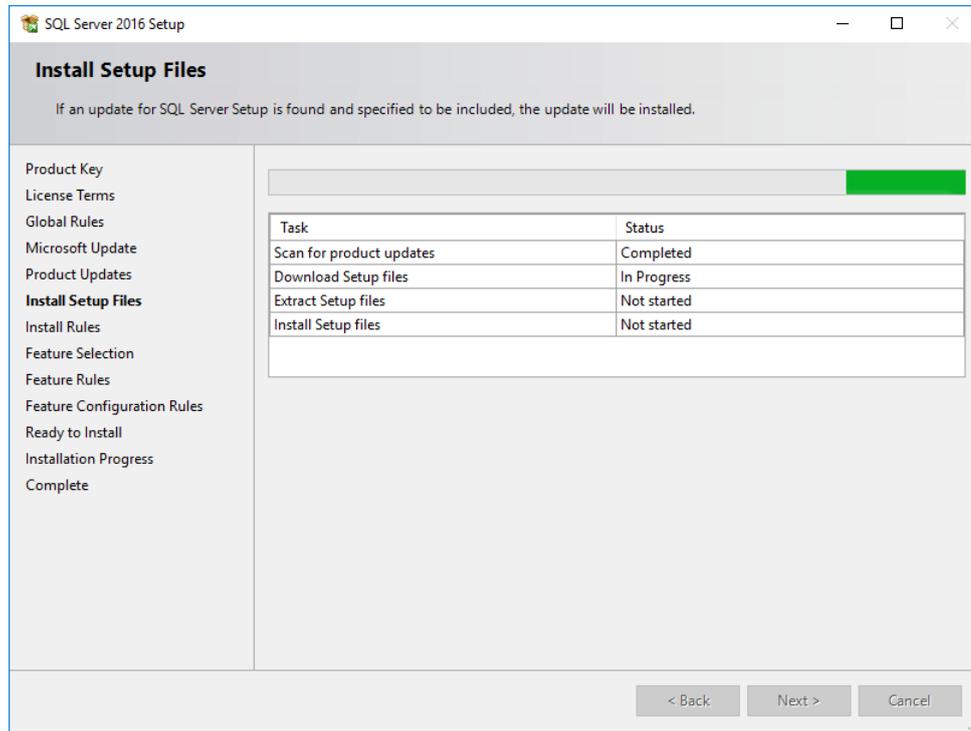


- On the Product Updates page, the latest available SQL Server product updates are displayed. If no product updates are discovered, SQL Server Setup does not display this page and auto advances to the Install Setup Files page. Otherwise review the information and resolve any issues, and then click “Next” to continue.

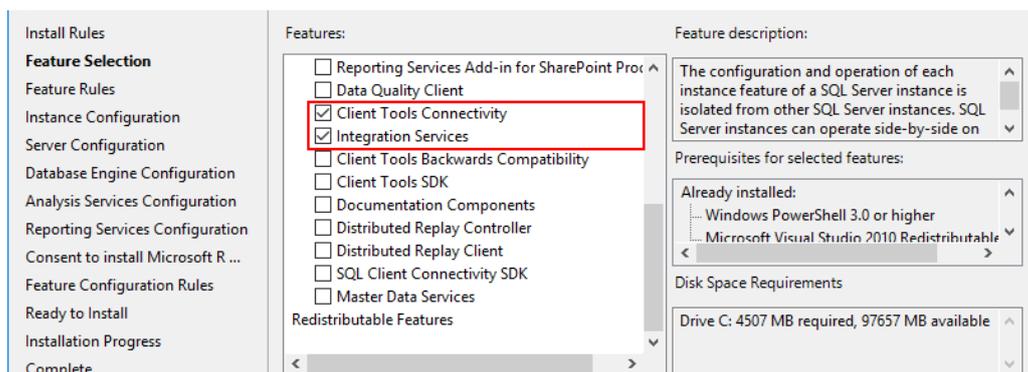
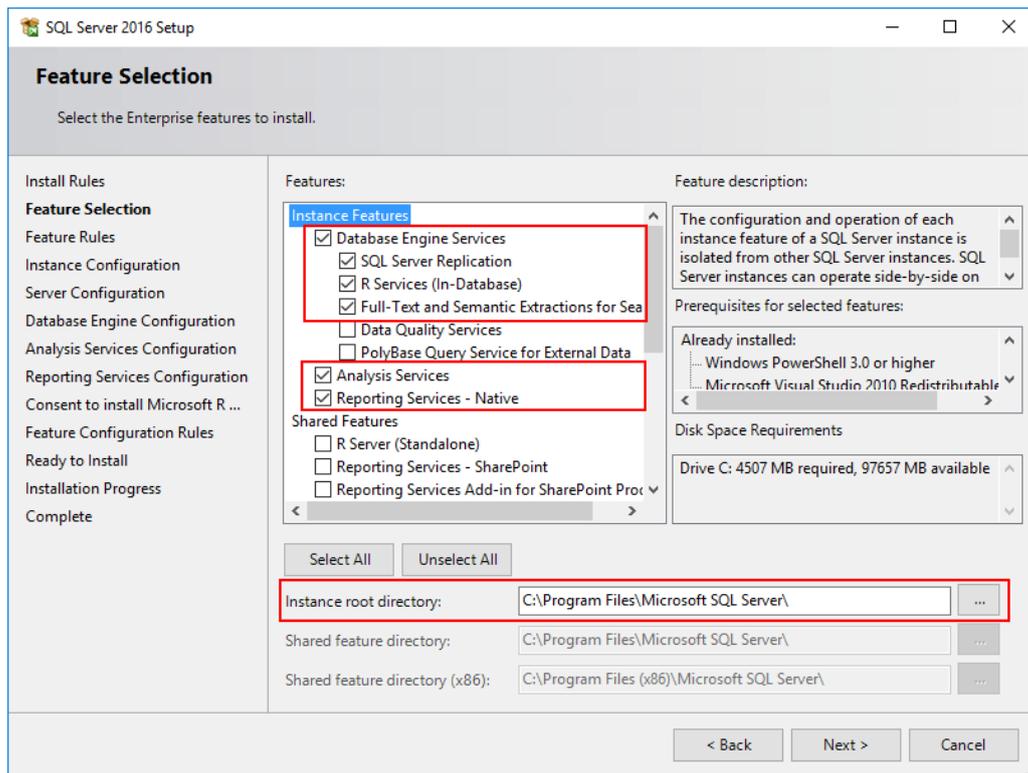


- On the Install Setup files page, Setup provides the progress of downloading, extracting, and installing the Setup files. If an update for SQL Server Setup is found, and is specified to be included, that update will also be installed.

- The System Configuration Checker verifies the system state of your computer before Setup continues.
- If prompted to restart the computer, click "OK"



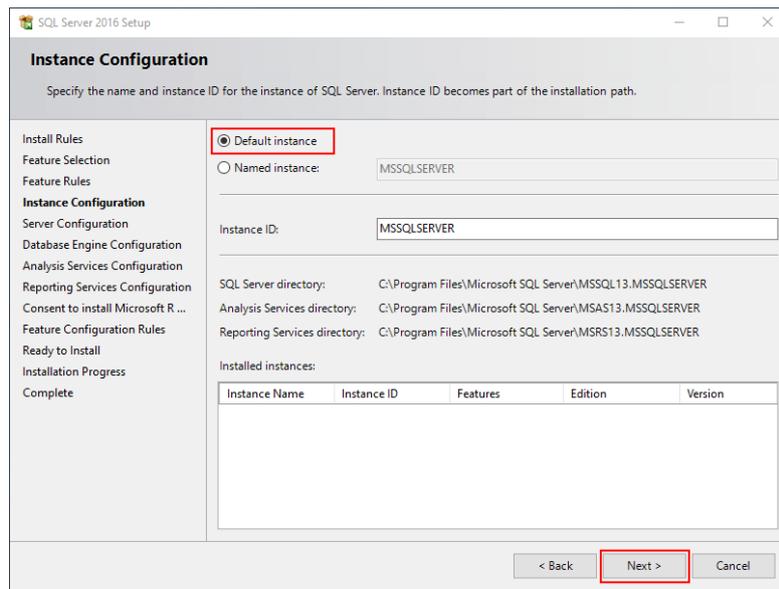
- On the Install Rules page, another rule check will be run to ensure everything is in place so the setup will be successful. If a rule checks fails, the setup application will provide the corrective measures to take so installation may proceed and then click on "Next" to continue.
- On the Feature Selection page, select the following features, and then click "Next" to continue.
 - Database Engine Services
 - SQL Server Replication
 - R Services (in-Database) (optional)
 - Full-Text and Semantic Extractions for Search
 - Analysis Services
 - Reporting Services - Native
 - Shared Features
 - Client Tools Connectivity
 - Integration Services



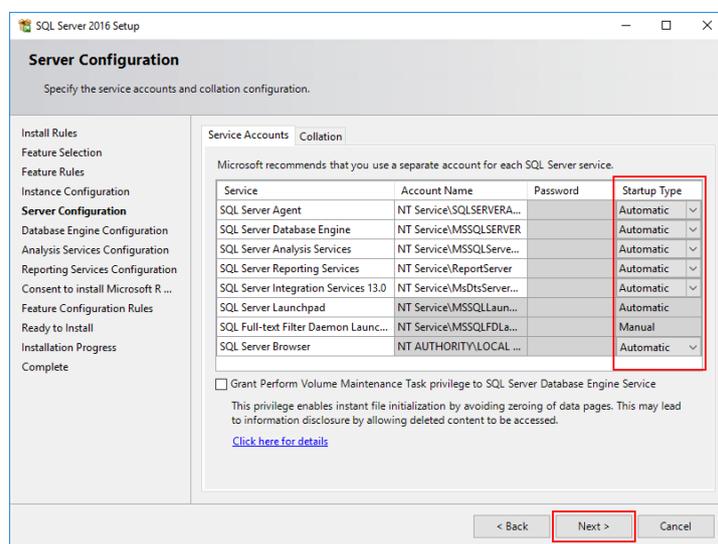
NOTE: SQL Server 2016 Data Tools is not included in the default installation of SQL Server 2016. Although not necessary, if you wish to install you can download it here: <https://msdn.microsoft.com/en-us/library/mt204009.aspx>

NOTE: SQL Server Management Tools (Basic and complete) are not included in the default installation of SQL Server 2016. You can install the latest version of SQL Server Management tools online, or install from the installation media in the option "Install SQL Server Management Tools" (which will be explained later).

- On the Feature Rules page, Setup verifies the system state of your computer before Setup continues. The Feature Rules page will automatically advance if all rules pass. Otherwise review the information and resolve any issues, and then click "Next" to continue.
- On the Instance Configuration page, select "Default instance", leave the rest of the default values, and then click "Next" to continue.

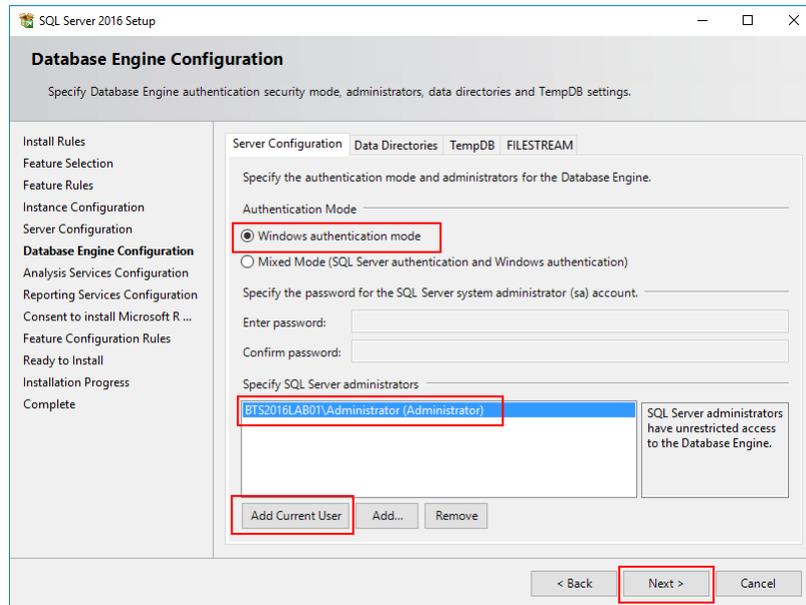


- On the Server Configuration page, you can specify login accounts for each SQL Server services. You can assign the same login account to all SQL Server services, or you can configure each service account individually. You can also specify whether services start automatically, are started manually, or are disabled (Microsoft recommends that you configure service accounts individually to provide least privileges for each service).
 - Leave the default login account to all SQL Server services
 - Configure all of them with the startup type: “Automatic”
 - And then click “Next”

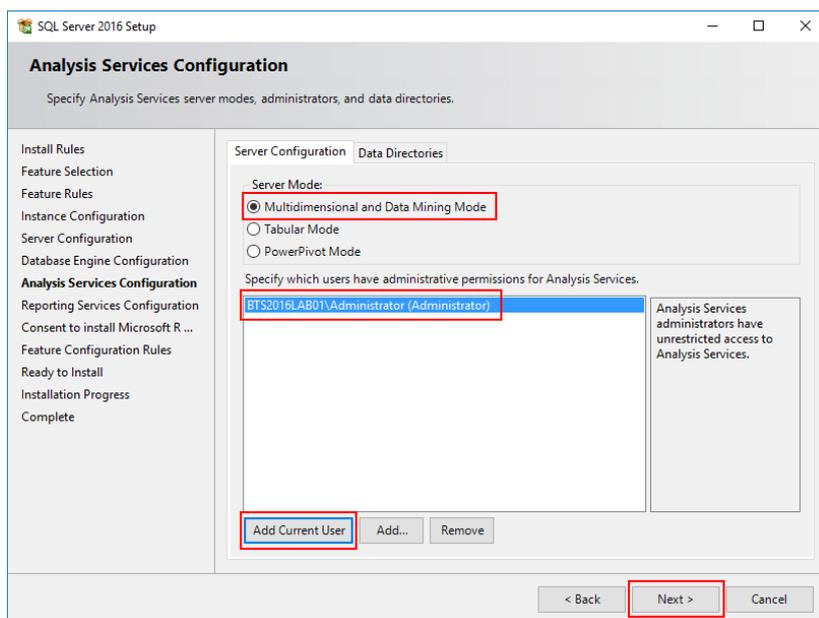


- On the Database Engine Configuration page, select “Windows authentication mode”, click “Add Current User”, and then click “Next”
 - Authentication Mode: Select “Windows authentication mode”. If you select Mixed Mode Authentication, you must provide a strong password for the built-in SQL Server system administrator account.

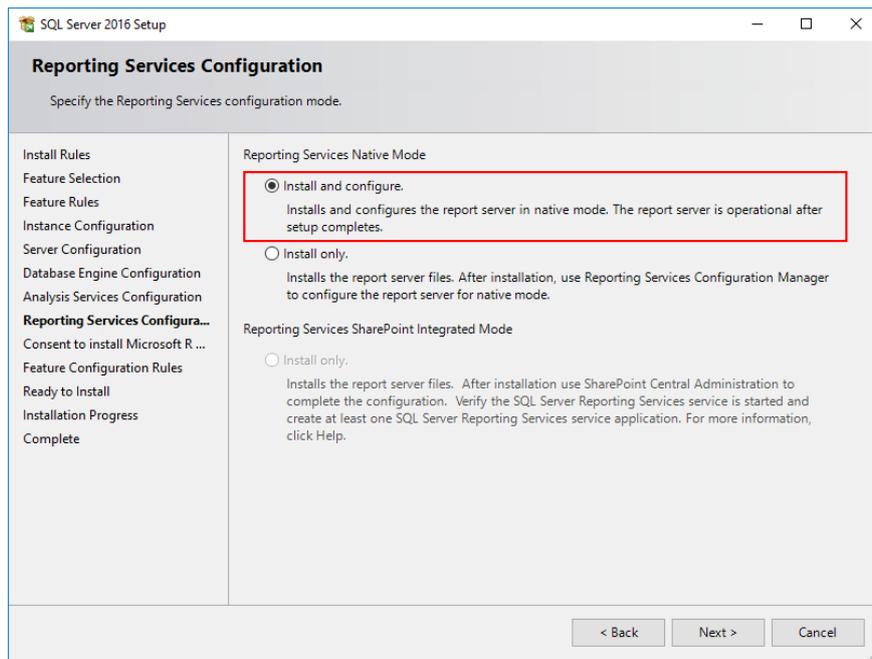
- Specify SQL Server administrators: You must specify at least one system administrator for the instance of SQL Server. To add the account under which SQL Server Setup is running, click “Add Current User”



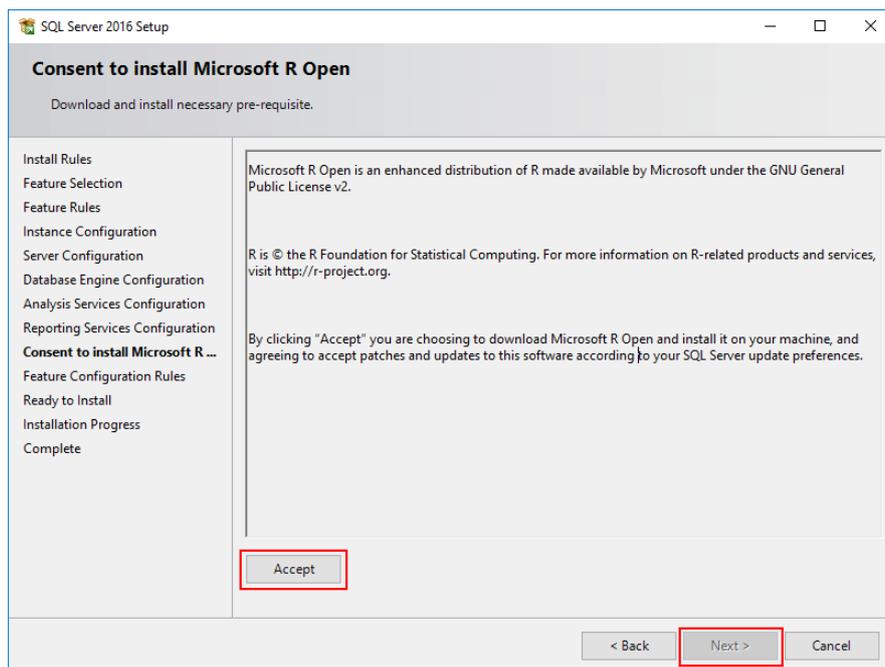
- On the Analysis Services Configuration page, select “Multidimensional and Data Mining Mode”, click “Add Current User”, and then click “Next”
 - Server Mode: Select “Multidimensional and Data Mining Mode”. Server mode determines which memory and storage subsystems are used on the server. If you plan to run multidimensional cube databases on the server, choose the default option, Multidimensional and Data Mining server mode.
 - Specify which users have administrative permissions for Analysis Services: you must specify at least one system administrator for Analysis Services. To add the account under which SQL Server Setup is running, click Add Current User.



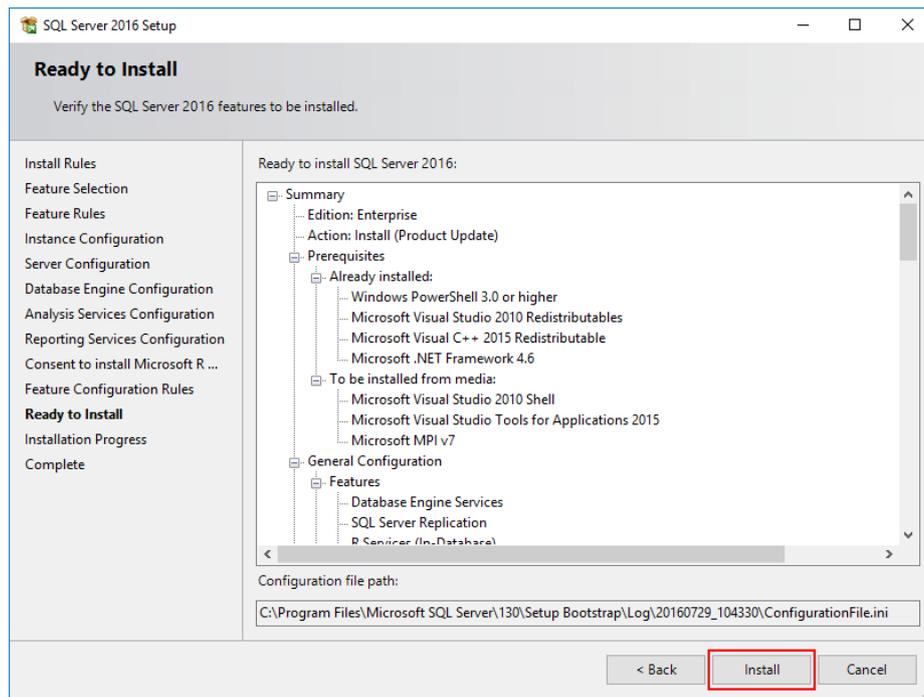
- On the Reporting Services Configuration page, select “Install and configure”, and then click “Next” to continue.



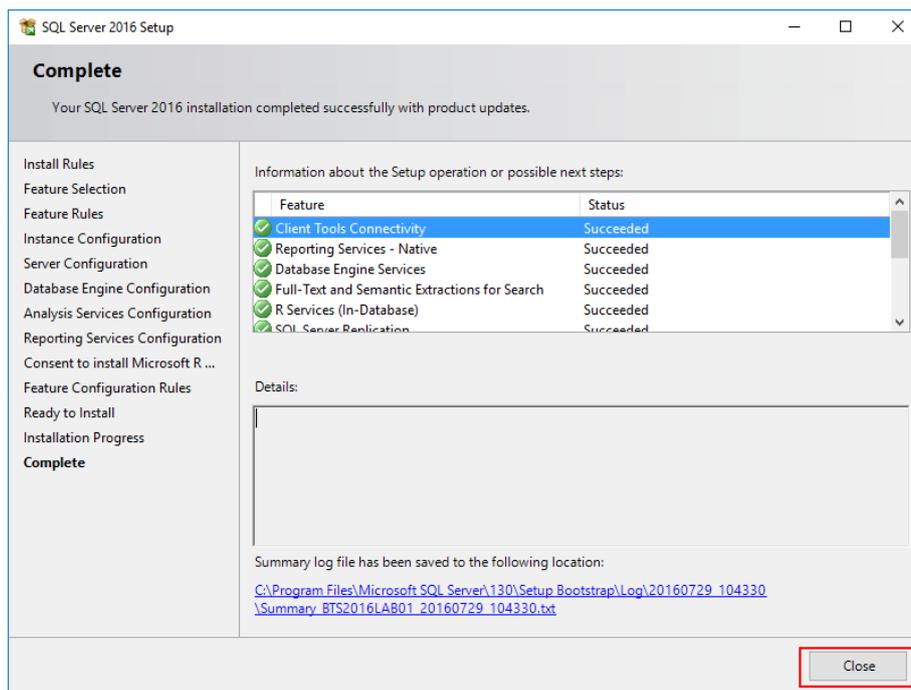
- Depending on the features you select to install, different pages can appear, in this scenario we have selected “R Services (in-Database)”. On the Consent to install Microsoft R Open page, click “Accept” and then click “Next” to continue.



- On the Feature Configuration Rules page, there is another step to check if everything is fine, setup will automatically advance to the next page if all rules pass. Otherwise review the information and resolve any issues, and then click “Next”
- On the Ready to Install page, review the information, and then click “Install”

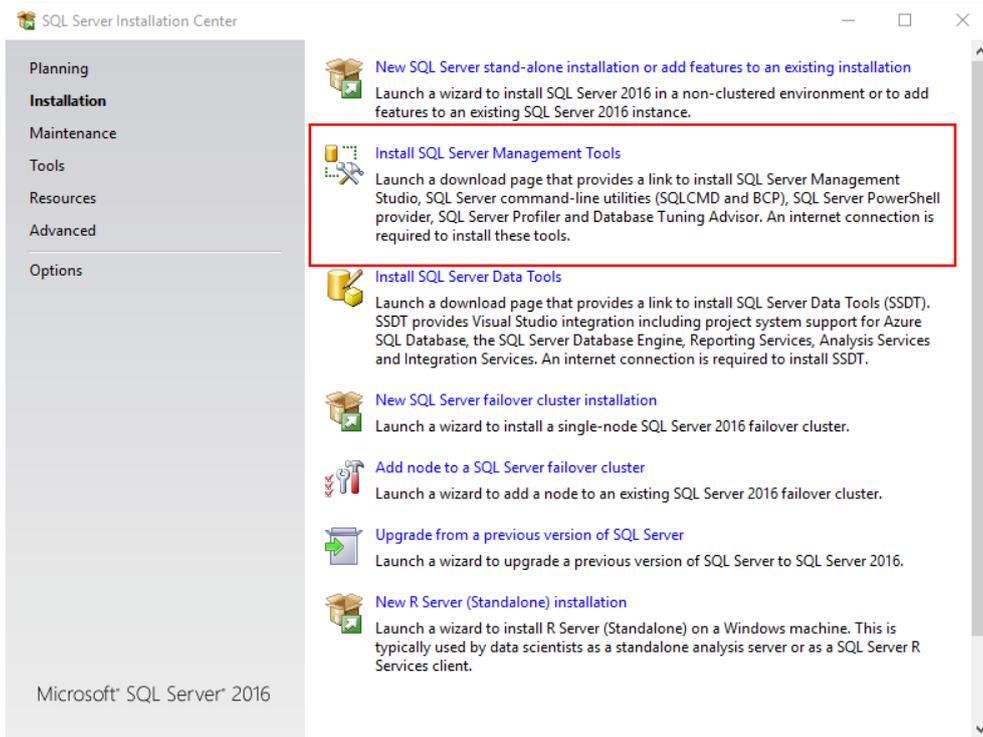


- On the Complete page, click “Close”

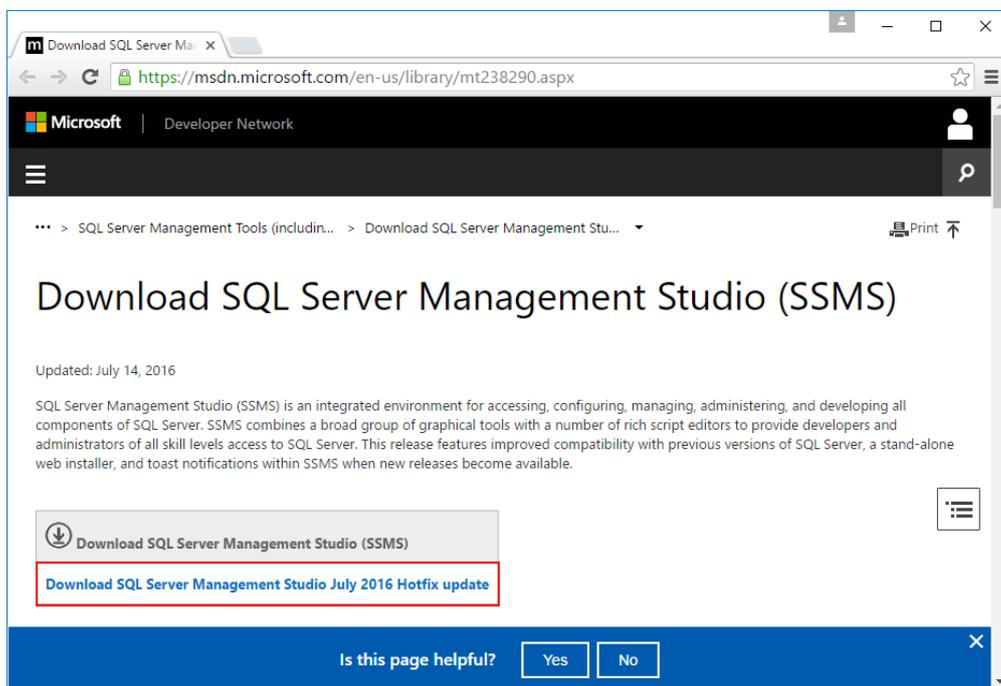


NOTE: Once again, SQL Server Management Tools (Basic and complete) are not included in the default installation of SQL Server 2016 and we need to install it using the “Install SQL Server Management Tools” available on the SQL Server Installation Center.

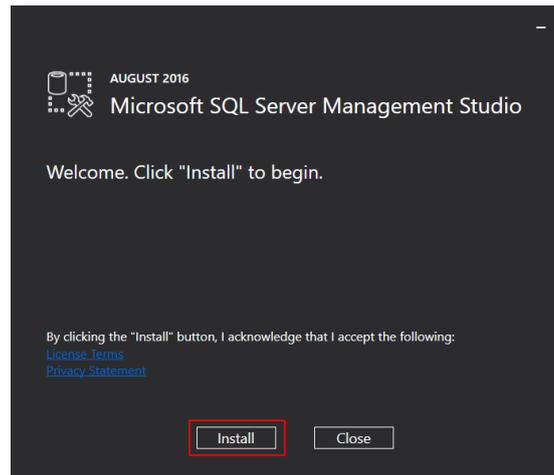
- On the SQL Server Installation Center, click “Installation” and then click “Install SQL Server Management Tools”



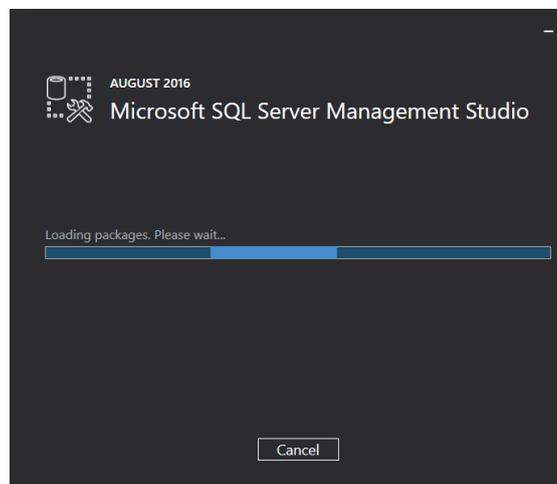
- This will open a page on your browser in which you can download the latest version of SQL Server Management tools.



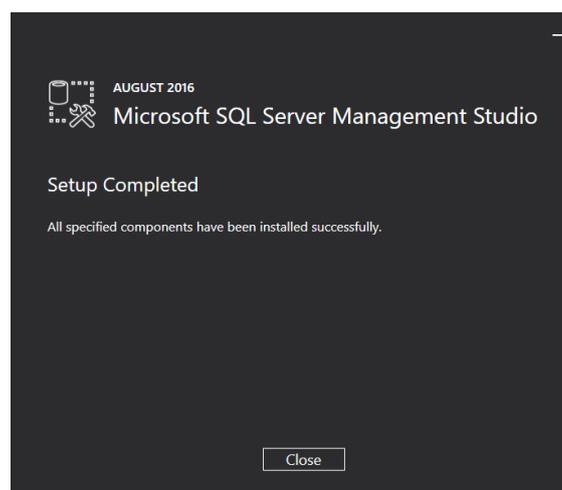
- Access the folder location in which you save the installation file and then execute the SQL Server Management tools setup file: SSMS-Setup-ENU.exe.
- On the Welcome page, click "Install"



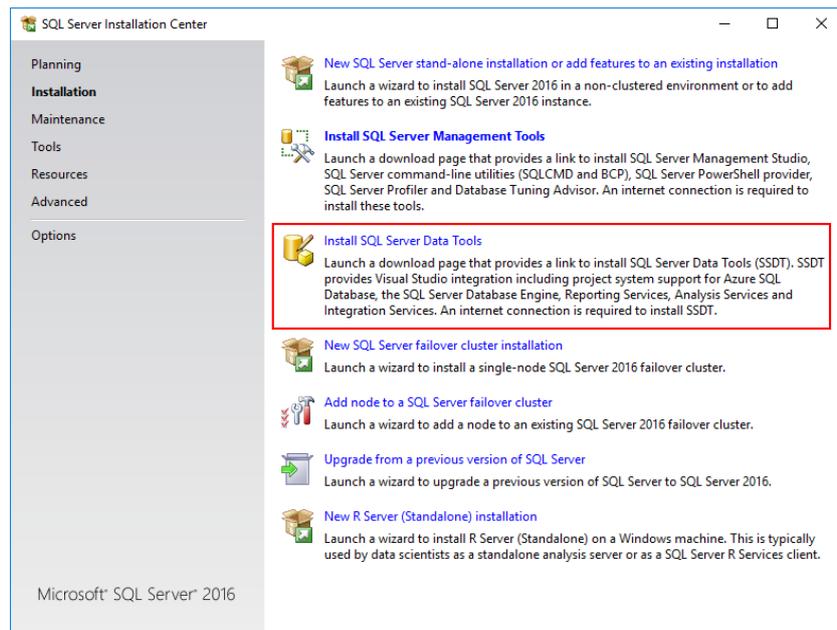
- The Setup Welcome page will extract and install all the necessary packages and will provide an overview of the installation progress.



- On the Setup Completed page, click “Close”



NOTE: You have a similar option to install SQL Server Data Tools, if you desire to install them.



Configure SQL Server Database Mail feature

If you wish to configure BAM Alerts on your BizTalk Server 2016 environment then you must already have configured SQL Server Database Mail feature before you try to configure BAM Alerts, otherwise the BizTalk Basic configuration will ignore this feature (BAM Alerts). This is because BAM Alerts with SQL Server 2016 or SQL Server 2014 uses Database Mail in SQL Server instead of SQL Notification Services that were used by previous versions of BizTalk Server with SQL Server 2008 R2 or below.

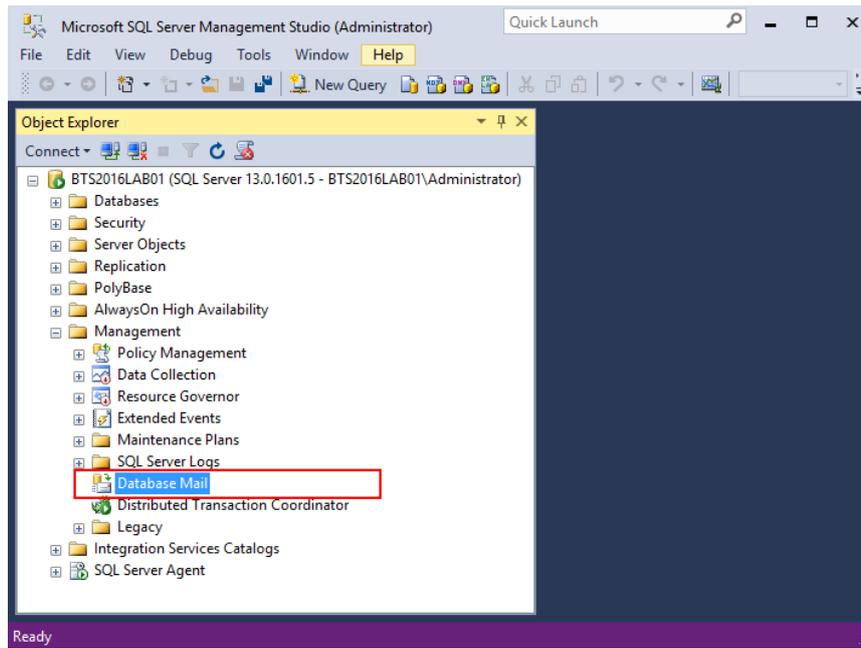
Database Mail is an enterprise solution for sending e-mail messages from the SQL Server Database Engine. Using Database Mail, your database applications can send e-mail messages to users. The messages can contain query results, and can also include files from any resource on your network. You can read more here: <http://msdn.microsoft.com/en-us/library/ms189635.aspx>

NOTE: You still can have BAM Portal with activities and aggregations without alerts, this is only mandatory if you want alerts.

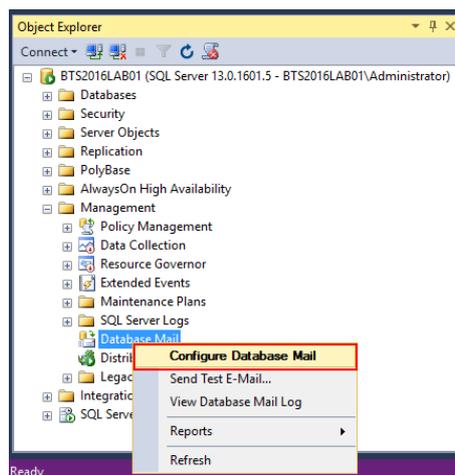
Before we begin, we need to determine the server name and port number for the Simple Mail Transfer Protocol (SMTP) server that we will use to send e-mail (if the SMTP server requires authentication, determine the user name and password for the SMTP server). In our case it will be the local SMTP Server that we previously installed and configured.

To Configure SQL Server Database Mail Account:

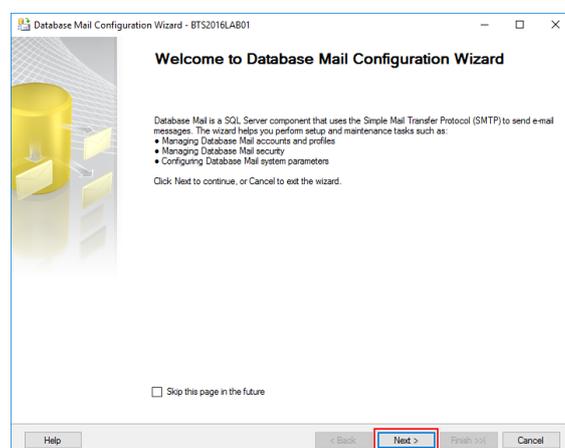
- Press the “Windows key” to open the Start menu, type “SQL Management” or “SQL” and click in “SQL Server 2016 Management Studio” option from the Search window.
- In Object Explorer panel, connect to the SQL Server instance you want to configure Database Mail on, and expand the server tree.
 - Expand the “Management” node



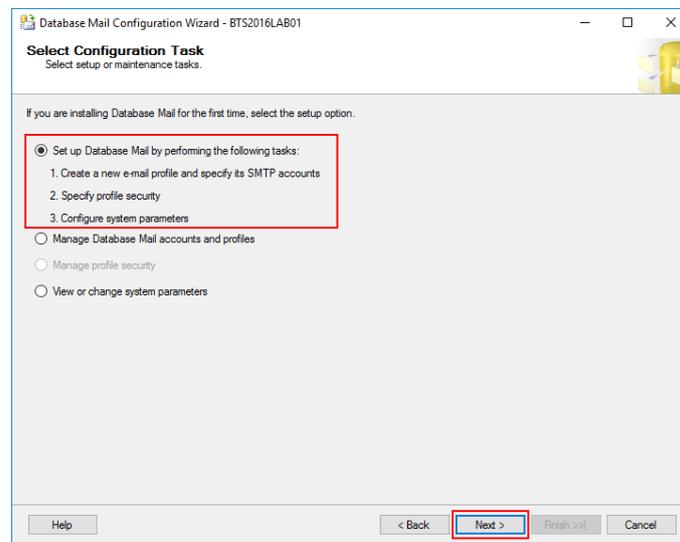
- Double click “Database Mail” to open the Database Mail Configuration Wizard.
 - Or right click under “Database Mail” and select the option “Configure Database Mail”



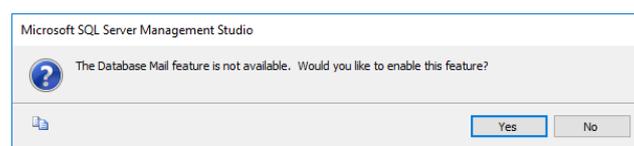
- On the Welcome to Database Mail Configuration Wizard page, click “Next” to continue



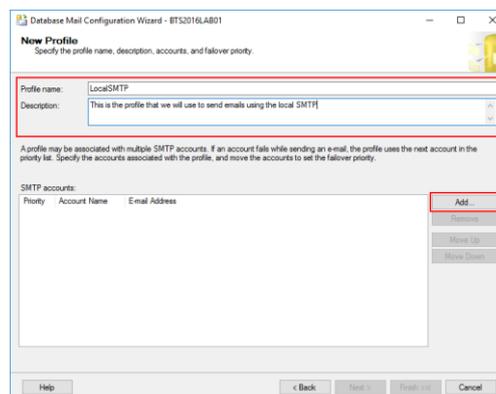
- On the Select Configuration Task page, select “Set up Database Mail by performing the following tasks:” and click “Next” to continue.
 - **Set up Database Mail by performing the following tasks:** Perform all of the tasks required to set up Database Mail for the first time. This option includes all of the other three options.
 - **Manage Database Mail accounts and profiles:** Create new Database Mail accounts and profiles or to view, change, or delete existing Database Mail accounts and profiles.
 - **Manage profile security:** Configure which users have access to Database Mail profiles.
 - **View or change system parameters:** Configure Database Mail system parameters such as the maximum file size for attachments.



- If Database Mail has not been enabled, you will receive the message: “The Database Mail feature is not available. Would you like to enable this feature?” Click “Yes” to continue.



- On the New Profile page, specify the “Profile name” and “Description” to be included in the profile, and click “Add...” to specify an account



- On the New Database Mail Account page, specify the account name, description, mail server information, and authentication type. Click “OK”

- A Database Mail account contains the information that SQL Server uses to send e-mail messages to an SMTP server. Each account contains information for one e-mail server and doesn't correspond to a SQL Server account or a Microsoft Windows account. Database Mail can be sent using the credentials of the SQL Server Database Engine, using other credentials that you supply, or anonymously. When using basic authentication, the user name and password in a Database Mail account are only used for authentication with the e-mail server. An account need not correspond to a SQL Server user or a user on the computer running SQL Server.
 - **Account name:** Type the name of the new account.
 - **Description:** Type a description of the account. The description is optional.
 - **E-mail address:** Type the name of the e-mail address for the account. This is the e-mail address that e-mail is sent from. For example, an account for SQL Server Agent may send e-mail from the address SqlAgent@Adventure-Works.com.
 - **Display name:** Type the name to show on e-mail messages sent from this account. The display name is optional. This is the name displayed on messages sent from this account. For example, an account for SQL Server Agent may display the name "SQL Server Agent Automated Mailer" on e-mail messages.
 - **Reply e-mail:** Type the e-mail address that will be used for replies to e-mail messages sent from this account. The reply e-mail is optional. For example, replies to an account for SQL Server Agent may go to the database administrator, danw@Adventure-Works.com.
 - **Server name:** Type the name or IP address of the SMTP server the account uses to send e-mail. Typically, this is in a format similar to smtp.<your_company>.com. For help with this, consult your mail

administrator. As I say early we will use our local SMTP Server, so the server name will be “localhost”

- **Port number:** Type the port number of the SMTP server for this account. Most SMTP servers use port 25.
 - **This server requires a secure connection (SSL):** Encrypts communication using Secure Sockets Layer.
 - **Windows Authentication using Database Engine service credentials:** Connection is made to the SMTP server using the credentials configured for the SQL Server Database Engine service.
 - **Basic Authentication:** Specify the user name and password required by the SMTP server.
 - **Anonymous authentication:** Mail is sent to the SMTP server without login credentials. Use this option when the SMTP server does not require authentication.
- Back on the New Profile page, click “Next” to continue

Database Mail Configuration Wizard - BTS2016LAB01

New Profile
Specify the profile name, description, accounts, and failover priority.

Profile name: LocalSMTP

Description: This is the profile that we will use to send emails using the local SMTP

A profile may be associated with multiple SMTP accounts. If an account fails while sending an e-mail, the profile uses the next account in the priority list. Specify the accounts associated with the profile, and move the accounts to set the failover priority.

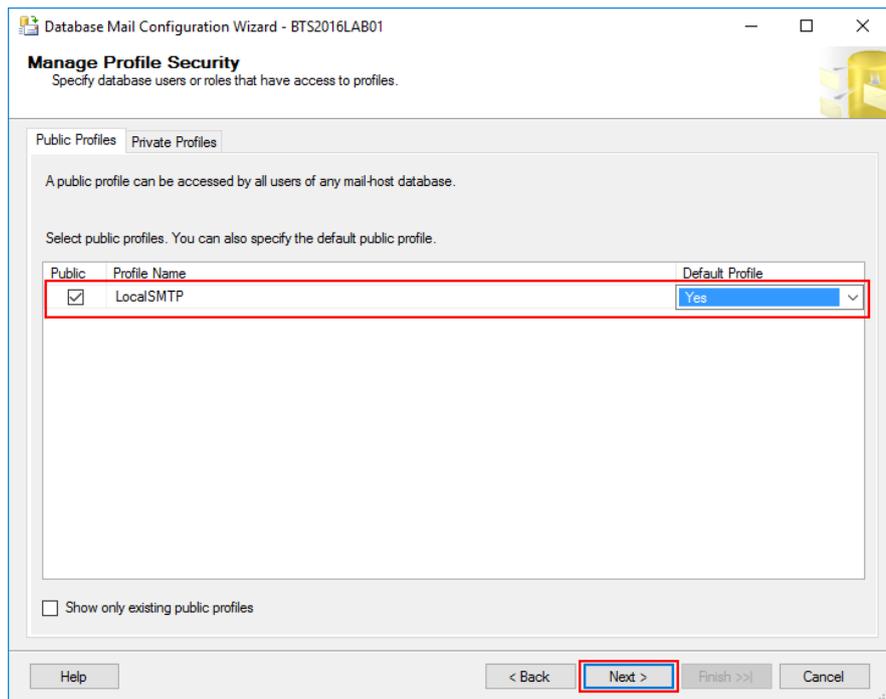
SMTP accounts:

Priority	Account Name	E-mail Address
1	SQL Administrator	sandro.pereira@devscope.net

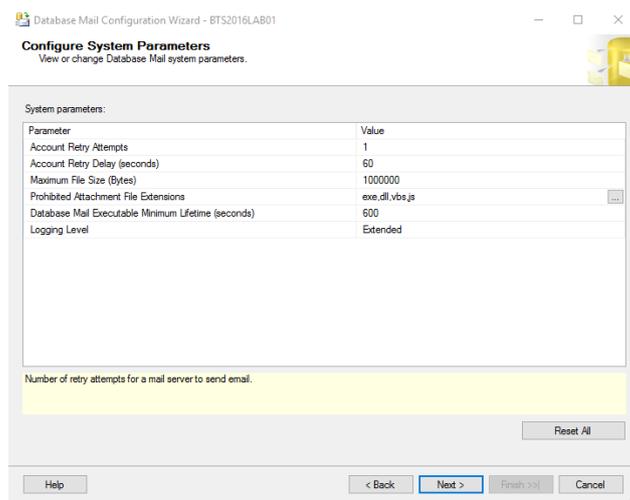
Buttons: Add..., Remove, Move Up, Move Down

Navigation: Help, < Back, **Next >**, Finish >>, Cancel

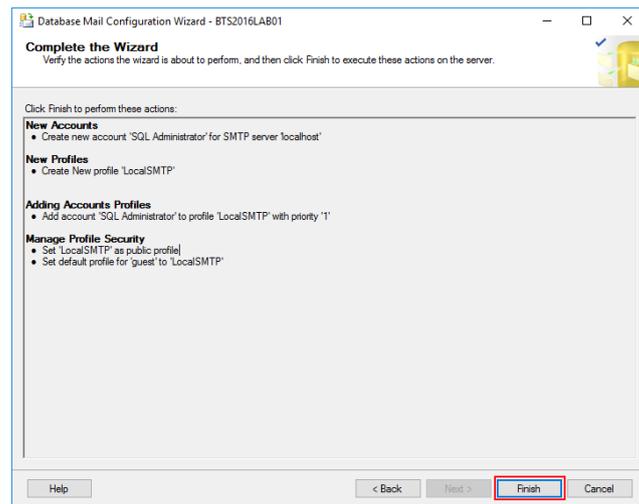
- On the Manage Profile Security page, you will be able to set the Public, Private and Default Profiles, select our profile as public and default and click “Next”.



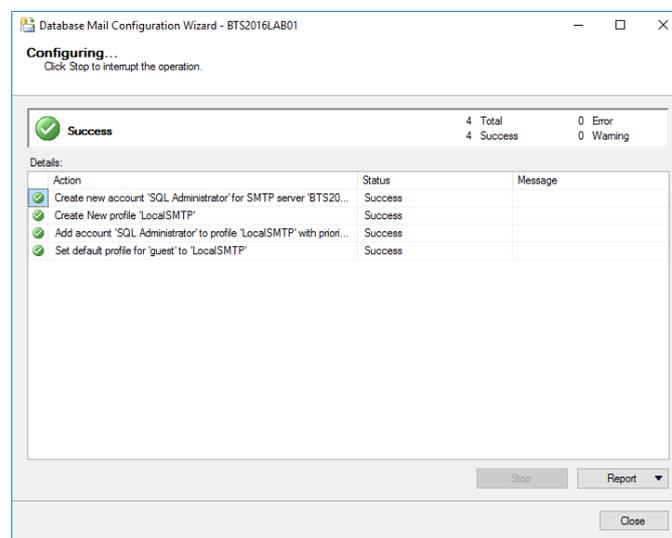
- On the Configure System Parameters page, leave the default values and click “Next”



- On the Complete the Wizard page, review the actions to be performed and click “Finish” to complete creating the new account.

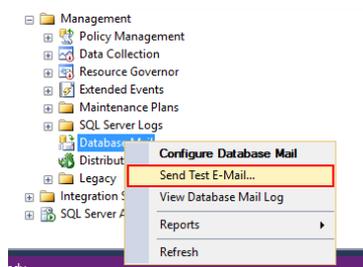


- On the Configuring... page, ensure that all actions succeeded and then click “Close”

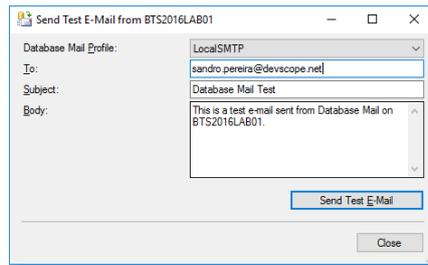


The Database Mail should now be configured successfully and all should be correctly setup to send emails, but we must make sure by testing it. So we will send a test email and confirm the reception. To do that:

- Right-click on Database Mail and select “Send Test E-Mail...”



- On the Send Test E-mail from windows, specify a “To:” email and click “Send Test E-Mail”



The Database Mail Test E-Mail dialog box confirms that the test message that Database Mail attempted to send the message and provides the “mailitem_id” for the test e-mail message. Check with the recipient to determine if the e-mail arrived. Normally e-mail is received in a few minutes or seconds. If you have received the email, you have been able to configure Database Mail successfully, but the e-mail can be delayed because of slow network performance, a backlog of messages at the mail server, or if the server is temporarily unavailable. Use the “mailitem_id” for troubleshooting.

Make sure that you have installed all the latest critical Windows updates from Microsoft and all the prerequisites before you install BizTalk Server 2016.

Install BizTalk Server 2016

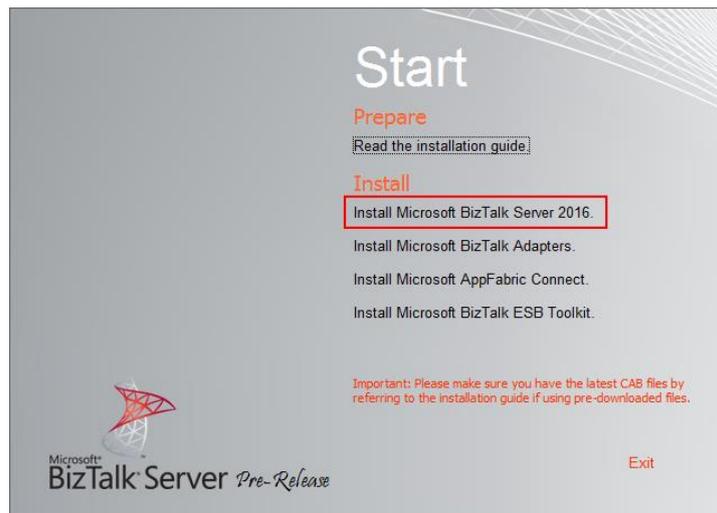
In this section you’ll install BizTalk Server, confirm that the installation succeeded, and then configure BizTalk Server.

When you installed SQL Server, setup granted your account Database Administrator rights. Since these rights are also required for installing BizTalk Server, you must do one of the following:

- Use the same account you used when you installed SQL Server.
- Or make sure the account you’re using now also has Database Administrator rights and is also local administrator.

To install BizTalk Server 2016

- Close any programs you have open. Run the BizTalk Server 2016 installer as Administrator.
- On the Start page, click “Install Microsoft BizTalk Server 2016”

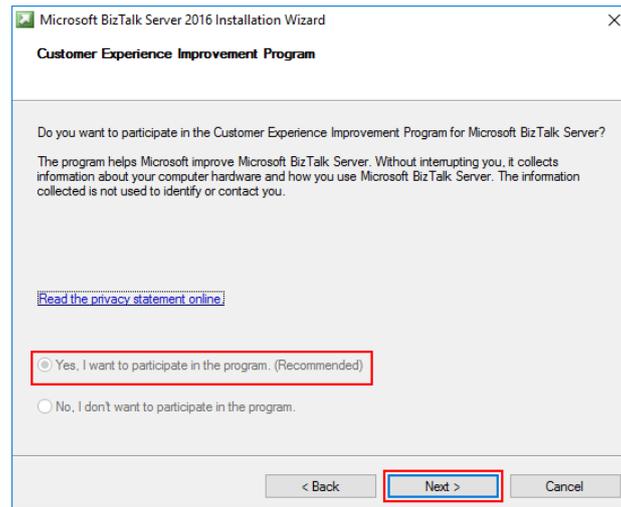


- On the Customer Information page, type your user name and organization, enter your product key, and then click “Next”

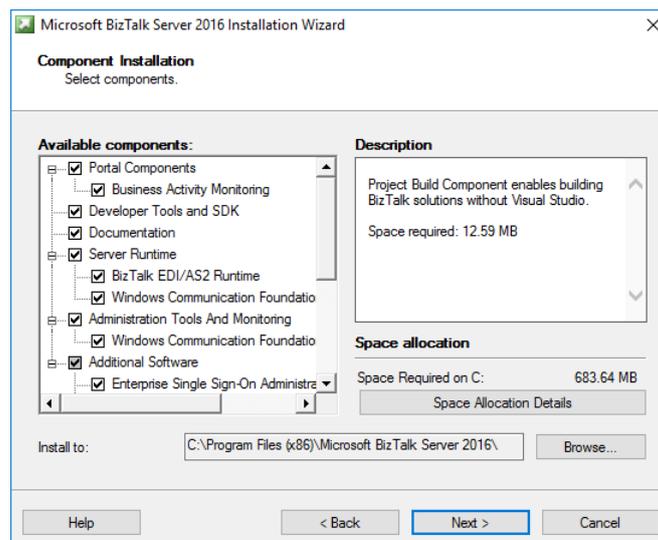
- On the License Agreement page, accept the license agreement by selecting “Yes. I accept the terms of the license agreement” option, and then click “Next”

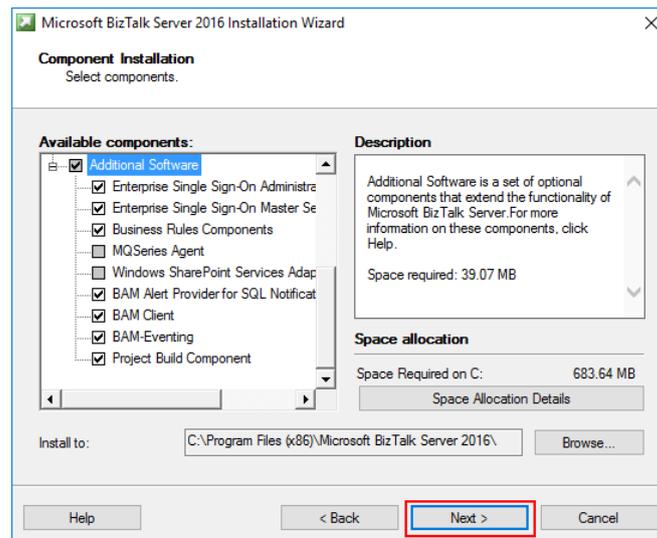
- On the Customer Experience Improvement Program page, specify whether you want to participate in the program, and then click “Next”

- BizTalk Server 2016 participates in the Customer Experience Improvement Program. As part of this support, you can choose to provide useful feedback to Microsoft regarding feature usage reporting functionality of BizTalk Server. The data collected from you is anonymous and cannot be used to identify you. Microsoft collects feature usage statistics as part of this program. By participating in this program, you can help improve the reliability and performance of various features of BizTalk Server. For more information about this program and its privacy policy, see Microsoft BizTalk Server CEIP Privacy Policy (<http://go.microsoft.com/fwlink/?LinkId=269607>).



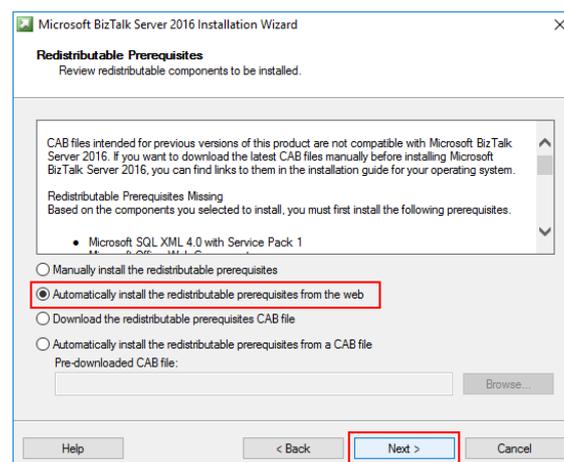
- On the Component Installation page, review the available components and select the ones you want to install.
 - Choose all possible components
 - Accept the default installation location or click Browse to move to the location where you want to install BizTalk Server 2016.
 - And then click “Next”





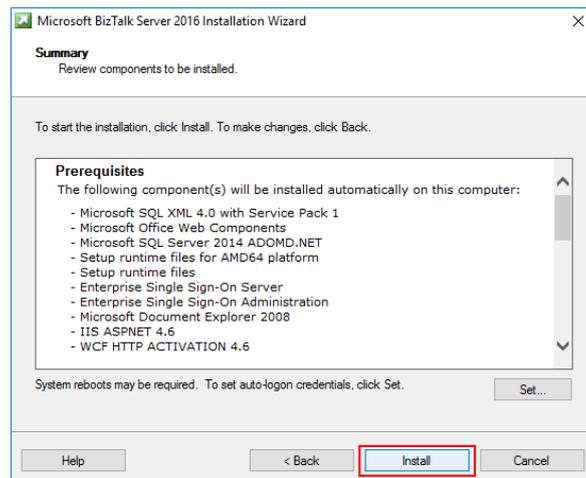
- On the Redistribute Prerequisites page, if your computer is missing a prerequisite component such as ADOMD.NET, Setup is able to install redistributable prerequisites automatically either from the Web or from a pre-downloaded CAB file. You can either:
 - Select “Automatically install the redistributable prerequisites from the web”, this option will require internet access.
 - Or if you prefer you can select “Automatically install the redistributable prerequisites from a CAB file” if you have already downloaded the CAB file. If you select this, you can then browse to the location of the CAB file and select it.
 - And then click “Next” to continue.

NOTE: To understand all options and where to find the Redistributable CAB Files, see: [APPENDIX B: REDISTRIBUTABLE CAB FILES](#)

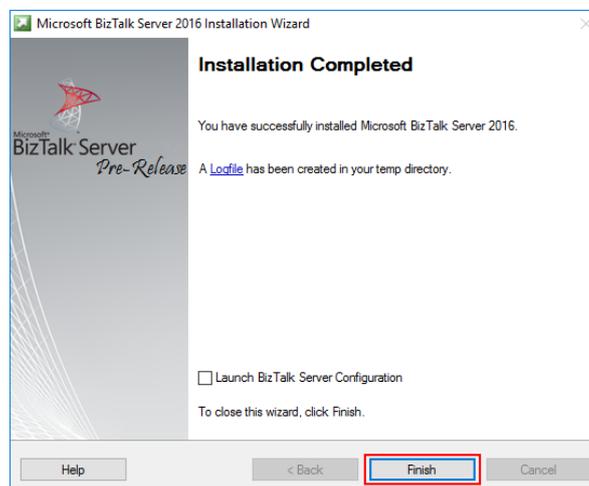


- On the Summary page, verify that the components that you selected to install are correct.
 - To enable auto-logout after a system reboot, click “Set” and provide your logon information. Auto-logout is enabled only for reboots during setup, and is disabled when setup is complete.

- Click “Install” to start the installation process.



- On the Installation Completed page, clear the “Launch BizTalk Server Configuration” check box, and then click “Finish”

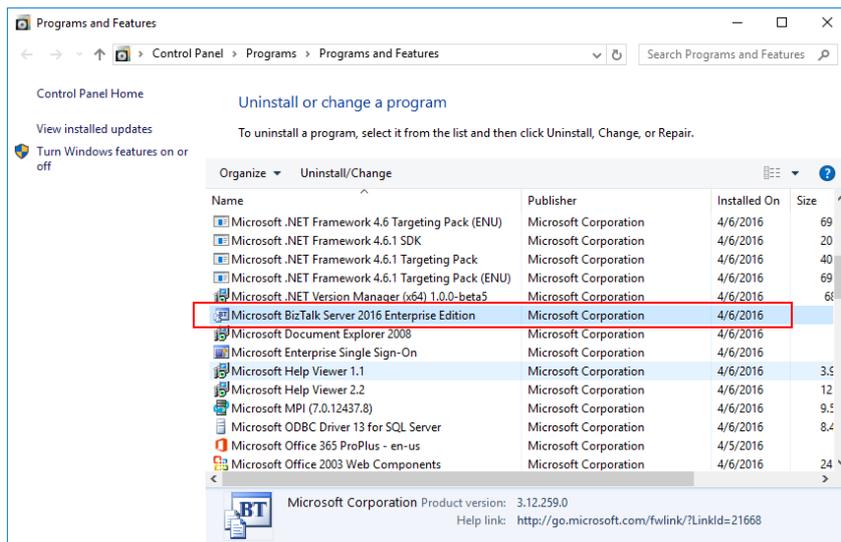


Verify Your Installation

You can check to see whether your installation was successful by using either Programs and Features or the Registry.

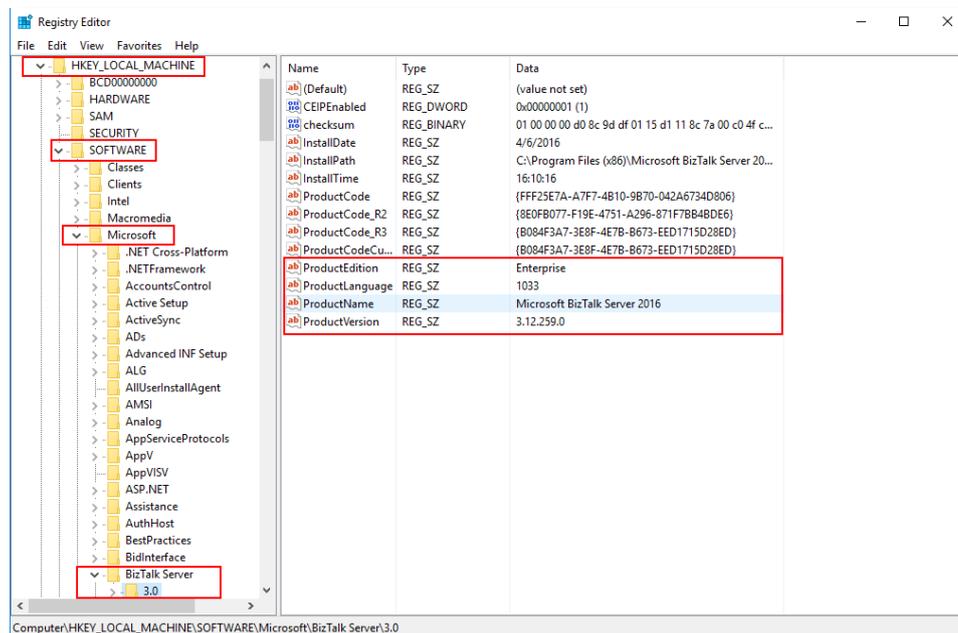
To verify installation using Programs and Features

- Press the “Windows key” to open the Start menu.
- Type “Programs and Features” and click in “Programs and Features” option from the Search window.
- When the list is fully populated, look for “BizTalk Server 2016 <Edition name> Edition”. If it appears in the list, the setup was succeeded.



To verify installation using the Registry:

- Press the “Windows key” to open the Start menu, type “regedit” and click in “regedit” option from the Search window.
- When the Registry opens, browse to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\BizTalk Server\3.0
 - If files exist in the 3.0 folder, the setup was succeeded.



- Close the Registry.

Configure BizTalk Server

Use the following procedure to complete a basic configuration of BizTalk Server. For information on customizing your configuration, see [Custom Configuration](#).

NOTE: If your BizTalk Server environment uses SQL Server 2016 and you wish to configure BAM Alerts, you must have already configured SQL Server Database Mail feature.

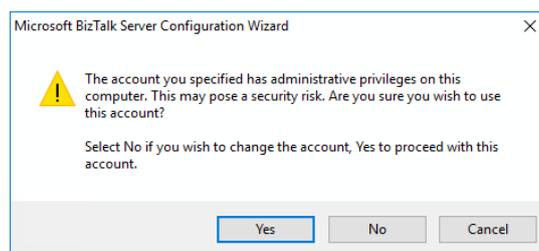
To configure BizTalk Server 2016 using Basic Configuration:

- Press the “Windows key” to open the Start menu, type “BizTalk Server Configuration” or “BizTalk”, right-click “BizTalk Server Configuration” option from the Search window, and then click Run as Administrator.
- On the Microsoft BizTalk Server 2016 Configuration page, apply the following configurations and then click “Configure” to continue:
 - Select “Basic configuration” option
 - In the “Database server name” field under “Database” properties, enter the name of the local computer.
 - In the “Service credential” properties, type the User name and Password for the account that the BizTalk services will run under.

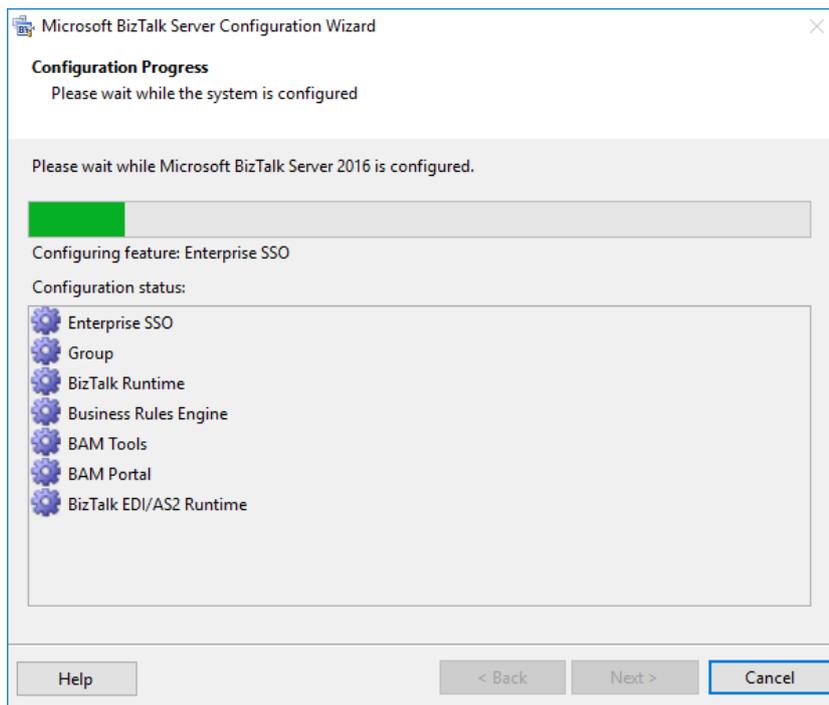
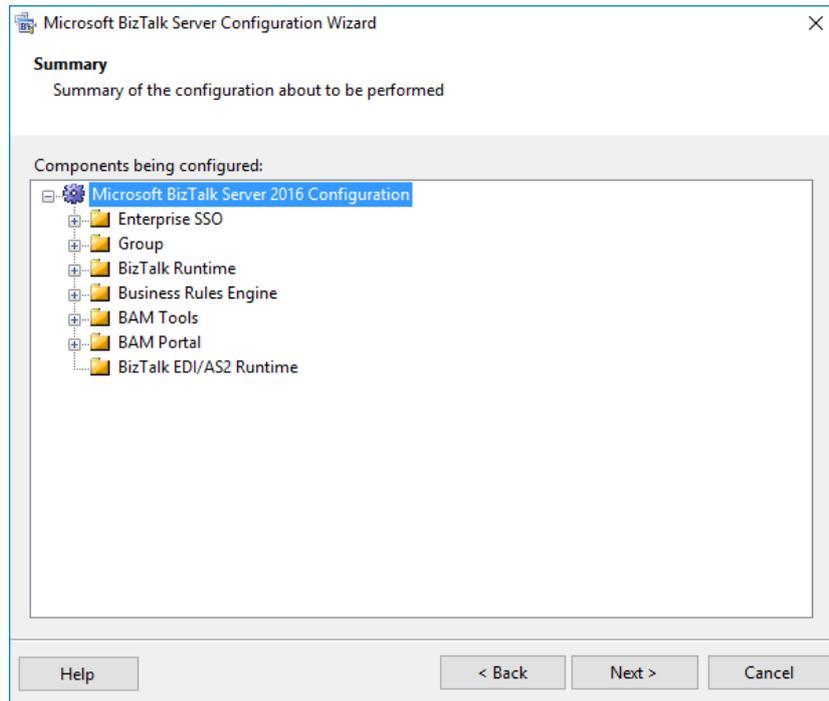
NOTE: If you are installing a multi-server BizTalk environment you should use “Custom configuration”. For helping you decide what kind of configuration you should use, see [APPENDIX C: BASIC CONFIGURATION VS. CUSTOM CONFIGURATION](#)

The screenshot shows the 'Microsoft BizTalk Server 2016 Configuration' dialog box. It has two radio buttons: 'Basic configuration' (selected) and 'Custom configuration'. Below this is a 'Description' section. The main area is titled 'Enter the database and service credential information:' and is divided into two columns. The left column is 'Database' and contains a text box for 'Database server name' with the value 'BTS2016LAB01'. The right column is 'Service credential' and contains a 'User name' text box with 'Administrator' and a 'Browse...' button, and a 'Password' text box with masked characters. At the bottom are 'Help', 'Configure', and 'Cancel' buttons.

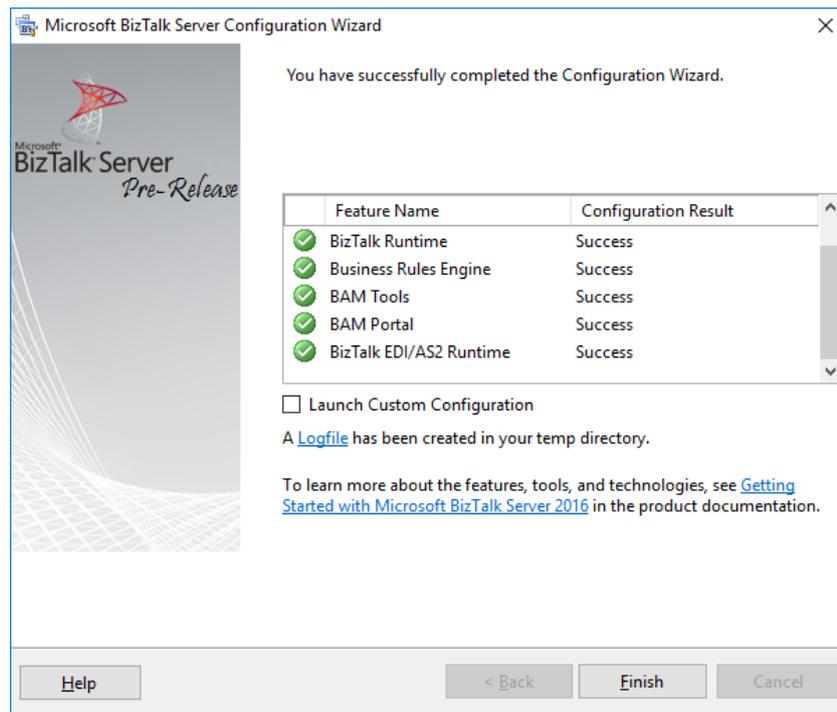
- **NOTE:** You may receive a warning if you enter a user name with administrative credentials on this computer. Click “Yes” to continue.



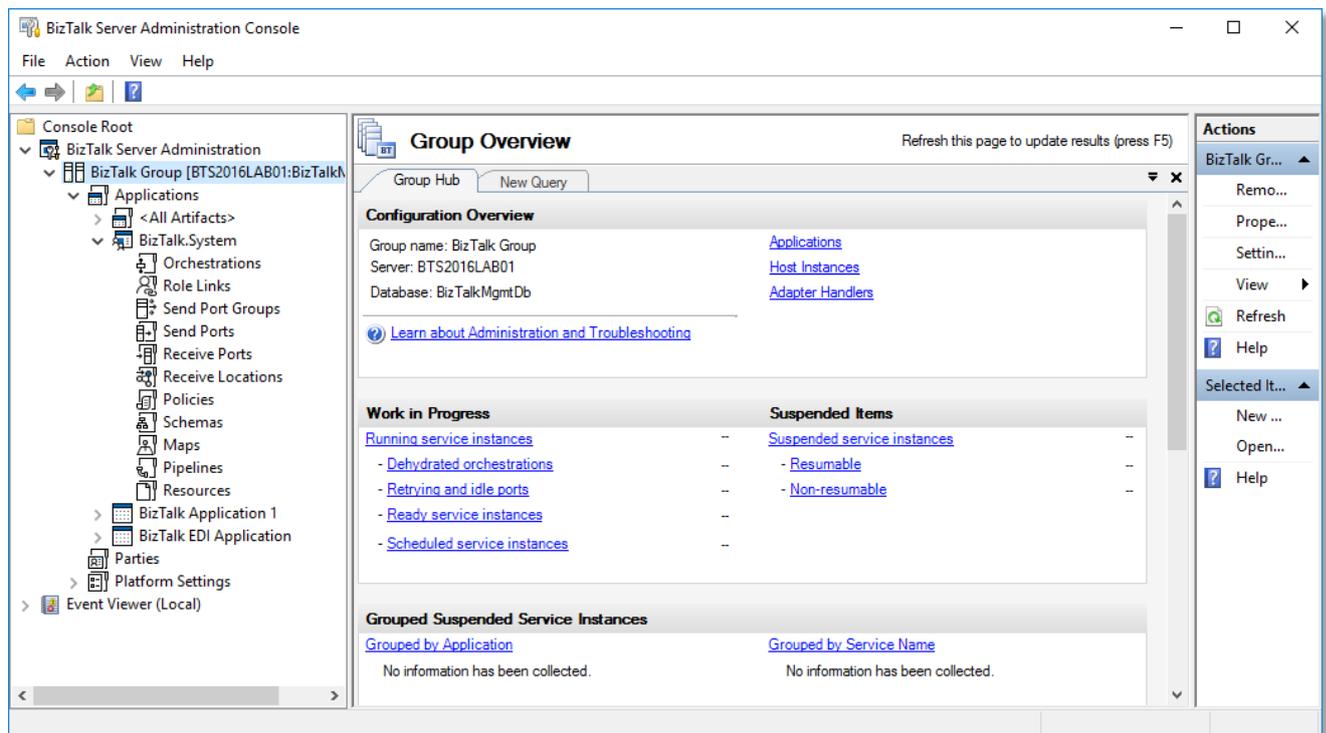
- On the Summary page, review the configuration about to be performed, and then click “Next”



- On the Completion page, click “Finish”



We now have BizTalk Server 2016 successfully Installed and Configured!!!



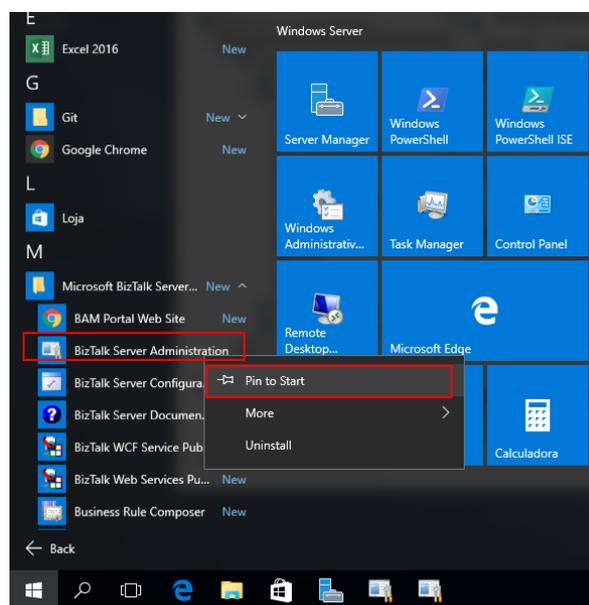
Pin BizTalk Server Administration to taskbar

Everybody knows that BizTalk Server Administration Console is the most important tool, it's a Microsoft Management Console (MMC) that you can use to manage and monitor BizTalk Server, and that you can use to deploy and manage your BizTalk Server applications.

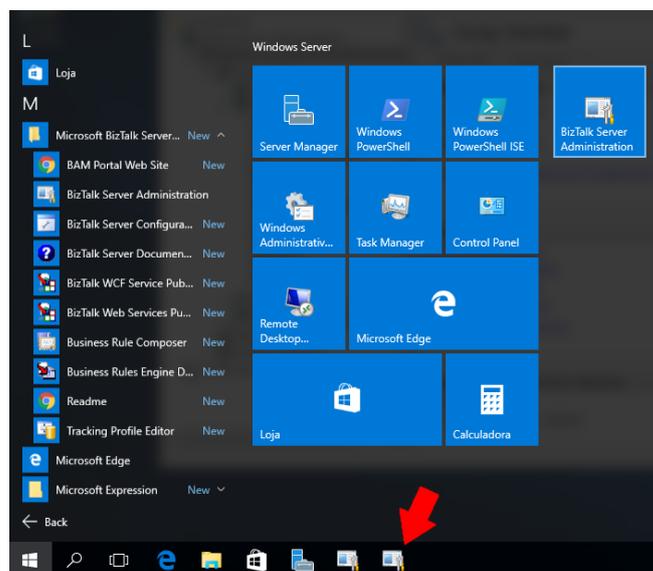
With the new UI in Windows Server 2016, almost all programs are “hidden” and can be easily be accessed through context search from the Start menu or from the Start menu itself. However, be constantly doing this type of operation eventually becomes annoying.

So to be able to quickly and easily access BizTalk Server Administration Console you can pin the console to the taskbar, to accomplish that you need:

- Press the “Windows key” to open the Start menu, type “BizTalk Server Administration” or “BizTalk” and right click in “BizTalk Server Administration” option from the Search window, and select “Pin to taskbar” option to add “BizTalk Server Administration” to your desktop taskbar.
- Or press the “Windows key” to open the Start menu, expand “All Apps > Microsoft BizTalk Server 2016”, right-click on “BizTalk Server Administration” and select “Pin to Start”



- From the start menu, drag the “BizTalk Server Administration” tile to the taskbar

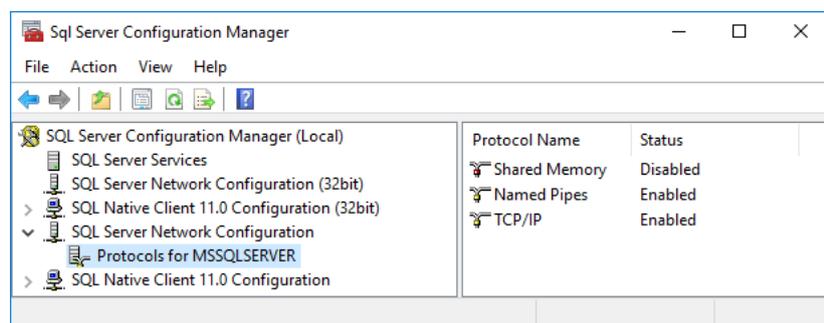


Configure SQL Server Network Configuration protocols

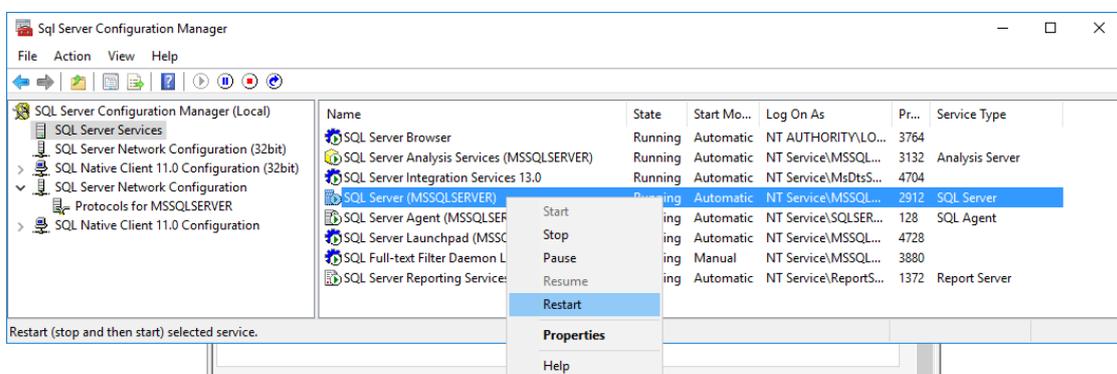
Under certain stress conditions (such as clients accessing SQL Server from the same computer), the SQL Server Shared Memory protocol may lower BizTalk Server performance. You can resolve this problem by disabling the use of the Shared Memory network protocol in SQL Server Network Configuration. Also, to facilitate transactions between SQL Server and BizTalk Server, you must enable TCP/IP and Named Pipes in SQL Server.

To configure the protocols for SQL Server:

- Press the “Windows key” to open the Start menu, type “SQL Server Configuration Manager” and click in “SQL Server 2016 Configuration Manager” option from the Search window.
 - Or press the “Windows key” to open the Start menu, expand “All Apps > Microsoft SQL Server 2016” and select “SQL Server 2016 Configuration Manager”
- In SQL Server Configuration Manager windows, from the left-hand pane expand “SQL Server Network Configuration” option and then click “Protocols for MSSQLSERVER”
 - Verify that both “TCP/IP” and “Named Pipes” are enabled;
 - If not, right-click in the protocol, and then click “Enable”
 - Repeat to enable the other protocol if necessary.
 - Verify that “Shared Memory” is disabled.
 - If not, right-click Shared Memory, and then click “Disable”



- In the left-hand pane, click “SQL Server Services”, right-click “SQL Server (MSSQLSERVER)”, and then click “Restart”. Or click “Stop” and when the service has stopped, right-click “SQL Server (MSSQLSERVER)” again, and then click “Start”.



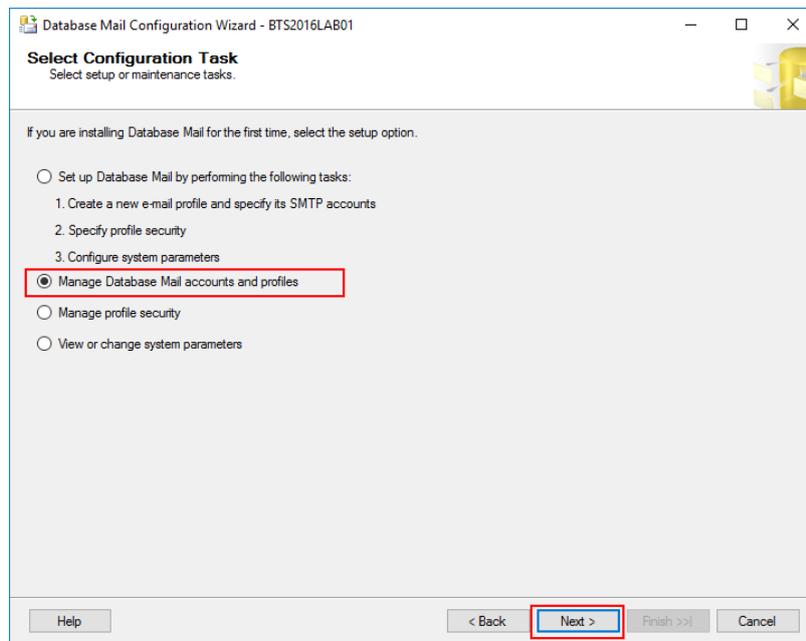
- Close SQL Server Configuration Manager.

Validate Mail account used by BizTalk to send BAM Alerts

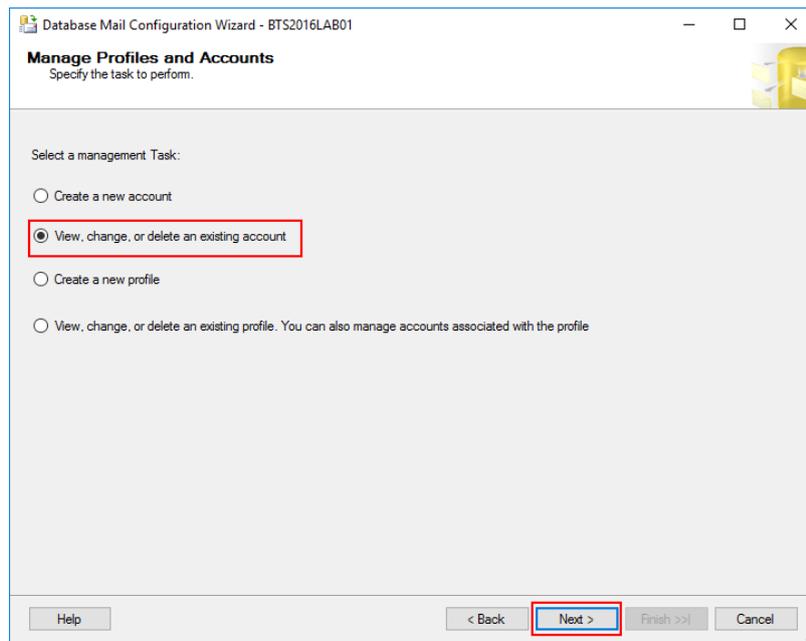
After you configure with success BizTalk Server 2016 BAM Alerts, the configurator will create a new Database Mail Account called “BAM_Alerts_Account” that will be used by BizTalk to send BAM Alerts.

To Validate Mail account used by BizTalk to send BAM Alerts:

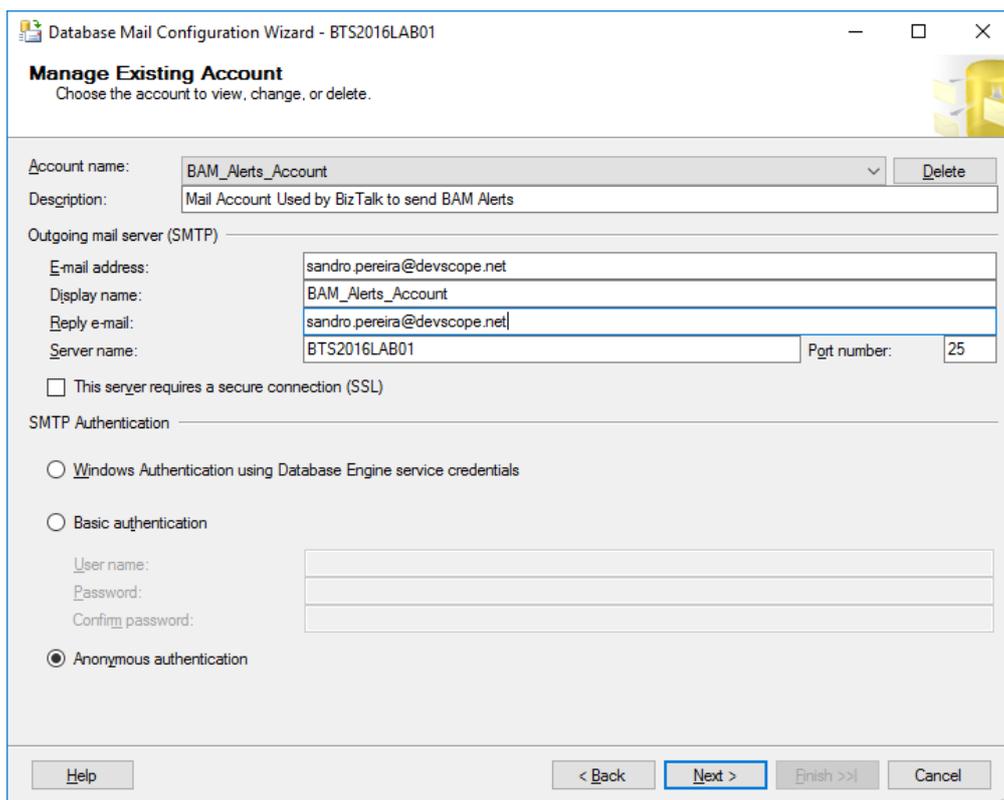
- Press the “Windows key” to open the Start menu, type “SQL Management” or “SQL” and click in “SQL Server 2016 Management Studio” option from the Search window.
- In Object Explorer panel, connect to the SQL Server instance you want to configure Database Mail on, and expand the server tree.
- Expand the “Management” node and double click “Database Mail” to open the Database Mail Configuration Wizard.
- On the Welcome to Database Mail Configuration Wizard page, click “Next” to continue
- On the Select Configuration Task page, select “Manage Database Mail accounts and profiles” option and click “Next”



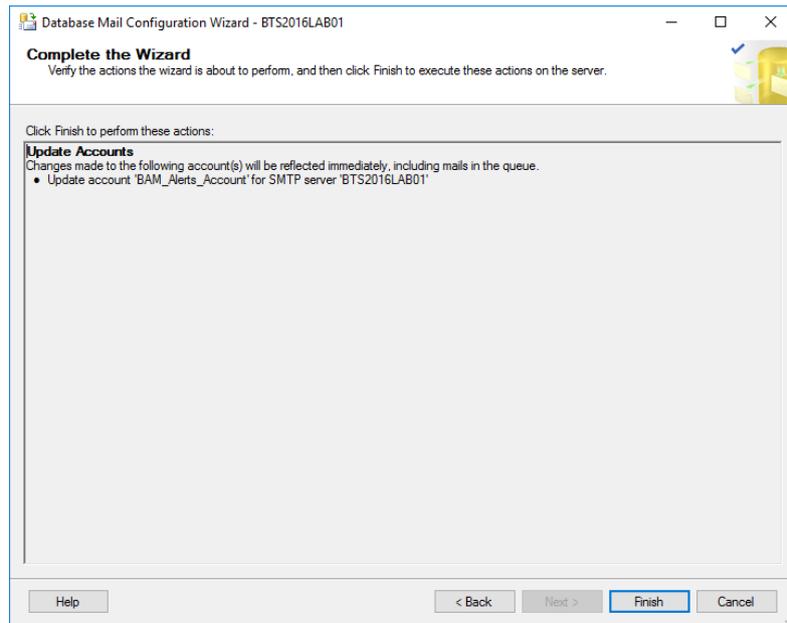
- On the Manage Profiles and Accounts page, select “View, change or delete an existent account” option, and click “Next”



- On the Manage Existing Account page, select “BAM_Alerts_Account” option under “Account name” and validate the configuration. After that click “Next” to make any change or “Cancel” to exit.

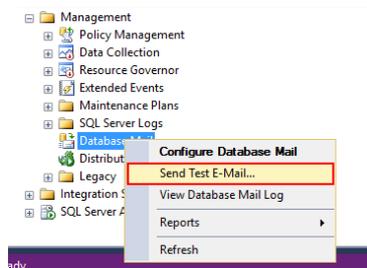


- On the Complete the Wizard page, click “Finish” or “Cancel”.

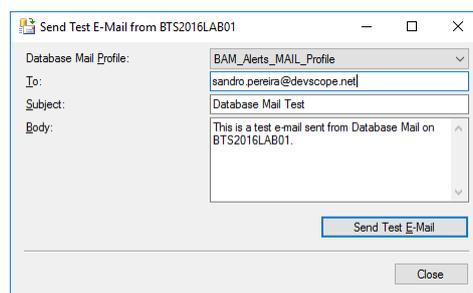


Finally, you should test sending an email with this Database Mail Account, to do that:

- Right-click on Database Mail and select “Send Test E-Mail...”



- On the Send Test E-mail from Windows, specify a “To:” email and click “Send Test E-Mail”



If all goes well you should receive the email in a few seconds. If you have received the email, you have been able to configure Database Mail successfully.

Install BizTalk Adapter Pack

BizTalk Adapter Pack along with BizTalk AppFabric Connect, RFID features, UDDI services and ESB Toolkit are not automatically installed with the default installation process, instead you have to additionally install this features.

The Microsoft BizTalk Adapter Pack contains adapters that enable enterprise applications and databases to interface with each other by implementing a common adapter framework. Similar to programming to Web services, adapters enable clients to program to different enterprise applications. Technically, adapters are a binding to Windows Communication Framework (WCF). The BizTalk Adapter Pack consists of the following adapters:

- Microsoft BizTalk Adapter for Oracle Database (Oracle Database adapter).
- Microsoft BizTalk Adapter for Oracle E-Business Suite (Oracle E-Business adapter).
- Microsoft BizTalk Adapter for mySAP Business Suite (SAP adapter). This also includes the .NET Framework Data Provider for mySAP Business Suite (Data Provider for SAP).
- Microsoft BizTalk Adapter for Siebel eBusiness Applications (Siebel adapter). This also includes the .NET Framework Data Provider for Siebel eBusiness Applications (Data Provider for Siebel).
- Microsoft BizTalk Adapter for SQL Server (SQL adapter).

Microsoft BizTalk Adapter Pack and Microsoft BizTalk Adapter Pack (x64)

If I'm preparing an x64 environment machine, why do I need to install both x86 and x64 Microsoft BizTalk Adapter Pack and not only x64 pack?

On any computer where you want to perform design-time tasks using either Visual Studio or BizTalk MMC, you must install the 32-bit adapter because:

- BizTalk Server Administration console runs as a 32-bit Microsoft Management Console (MMC) application.
- Visual Studio is also a 32-bit application (and there isn't any 64-bit version of Visual Studio)

However, for BizTalk run time perspective:

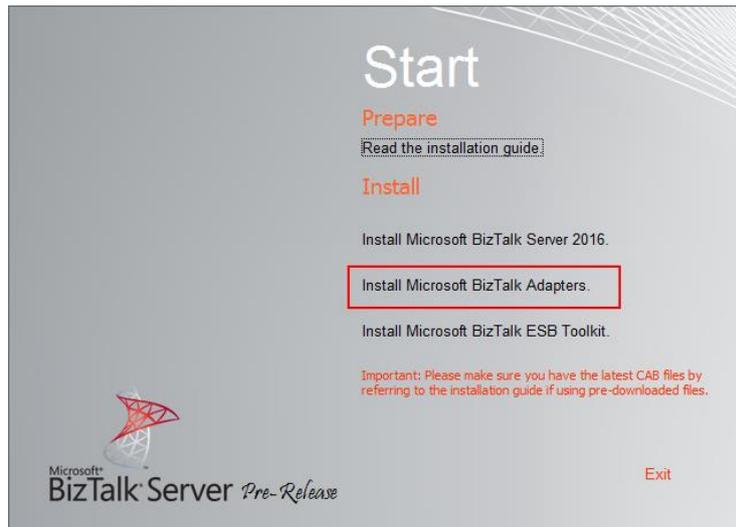
- If you want to run the adapters under a 32-bit BizTalk process (Host Instance): you need to install Microsoft BizTalk Adapter Pack.
- If you want to run the adapters under a 64-bit BizTalk process (Host Instance): you need to install Microsoft BizTalk Adapter Pack (x64).

So you always have to install Microsoft BizTalk Adapter Pack, or in other cases, you always need to install the 32-bit adapter if you want to perform any operation at design-time, especially, configuring the adapters in the administrative console.

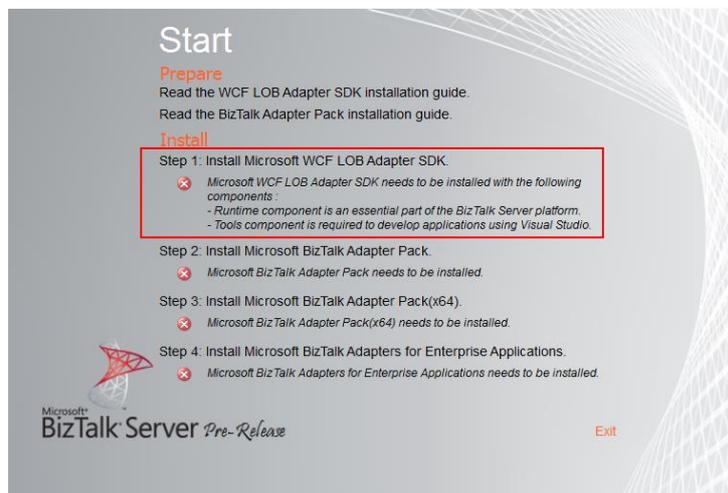
Steps to install BizTalk Adapter Pack

To install BizTalk Adapter Pack:

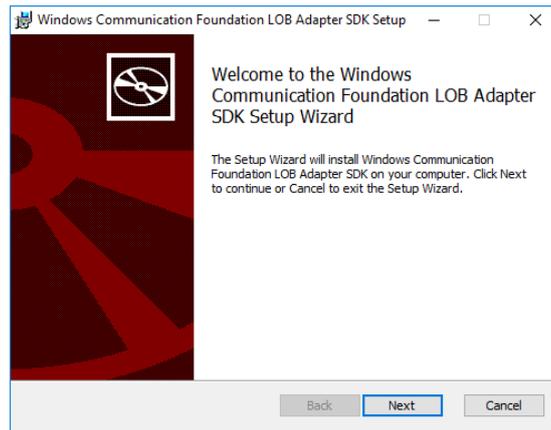
- Close any programs you have open. Run the BizTalk Server 2016 installer as Administrator.
- On the Start page, click "Install Microsoft BizTalk Adapters"



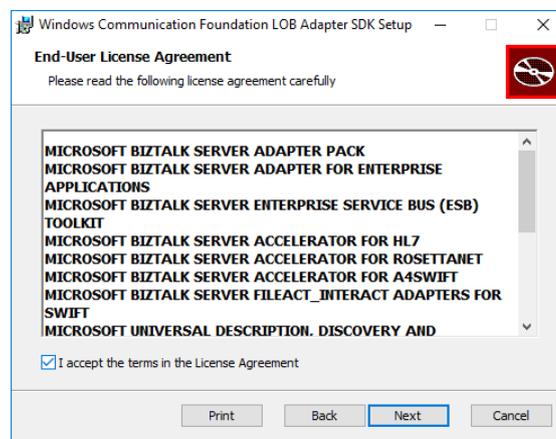
- In the next Start page, the first step is to install WCF LOB Adapter SDK, select the “Step 1. Install Microsoft WCF LOB Adapter SDK”. An installer of SDK is launched.



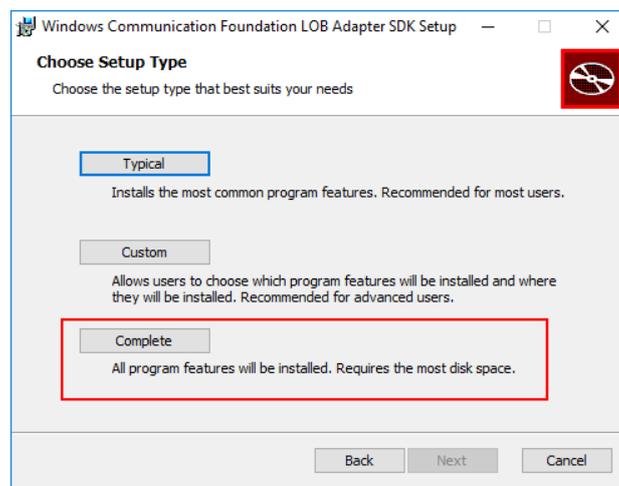
- The WCF LOB Adapter SDK is a collection of a run-time engine and tools that help adapter developers create service-oriented interfaces to existing LOB systems by using WCF. The goal of the SDK is to facilitate uniform development of reusable, metadata-oriented, WCF-based adapters that enable enterprise applications, databases, and messaging platforms to integrate with each other.
- On the Welcome to the Windows Communication Foundation LOB adapter SDK Setup Wizard page, click “Next”



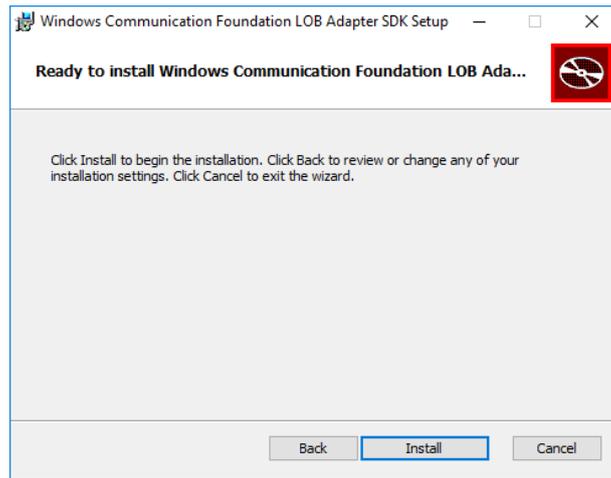
- On the End-User License Agreement page, select “I accept the terms in the License Agreement” to accept the license agreement and click “Next”



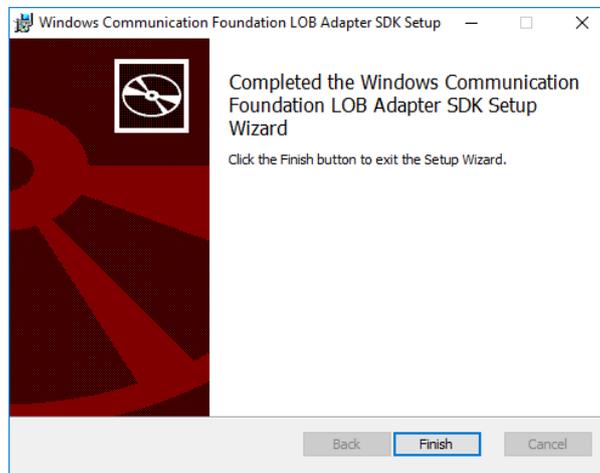
- In the Choose Setup Type page, select the installation type “Complete”:
 - Typical: will install the common run time and tools,
 - Custom: will allow you to select the features that you want to install and the installation location.
 - Complete: will install all the features.



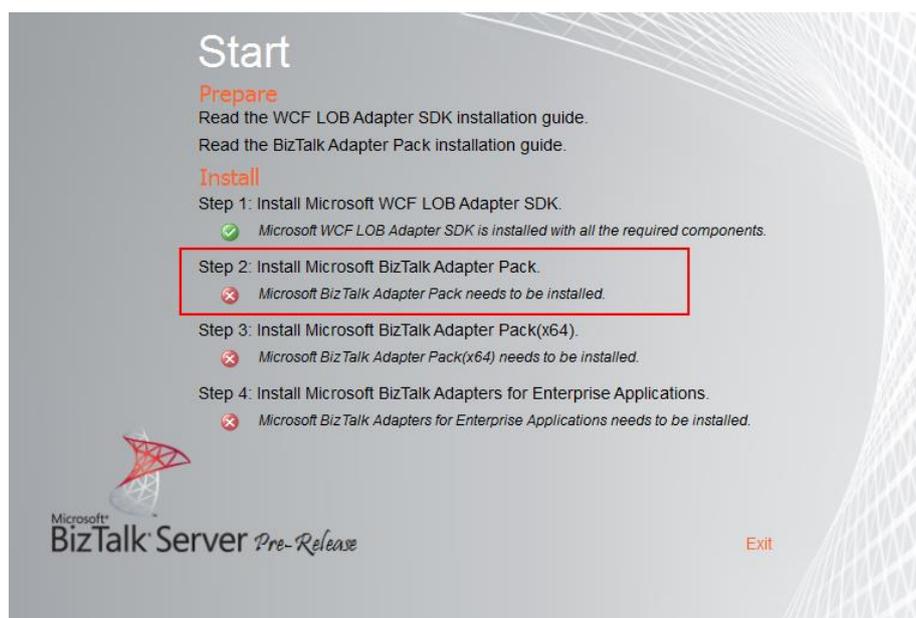
- On the Ready to install WCF LOB adapter SDK page, click “Install”



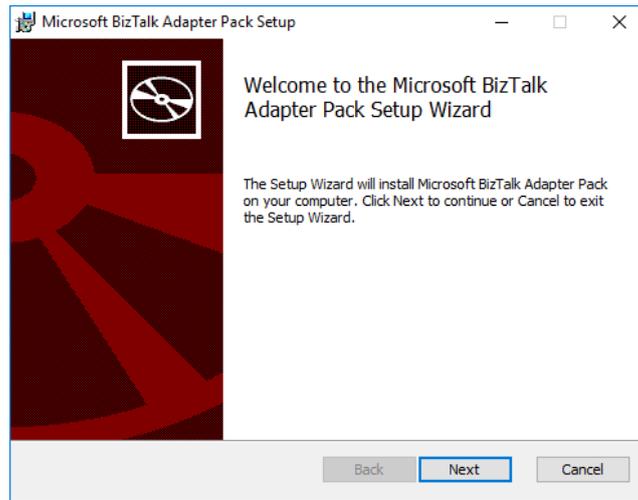
- On the Completed the Windows Communication Foundation LOB Adapter SDK Setup Wizard page, click “Finish”



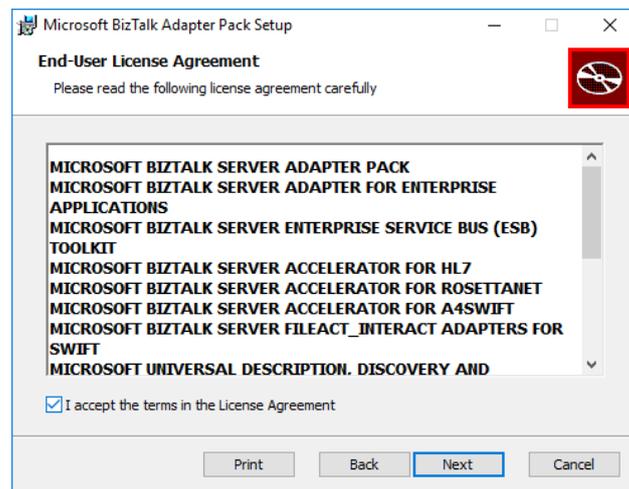
- Back to the Start page, the second step is installation of the Adapter Pack (x86), select the “Step 2. Install Microsoft BizTalk Adapter Pack”. An installer of SDK is launched.



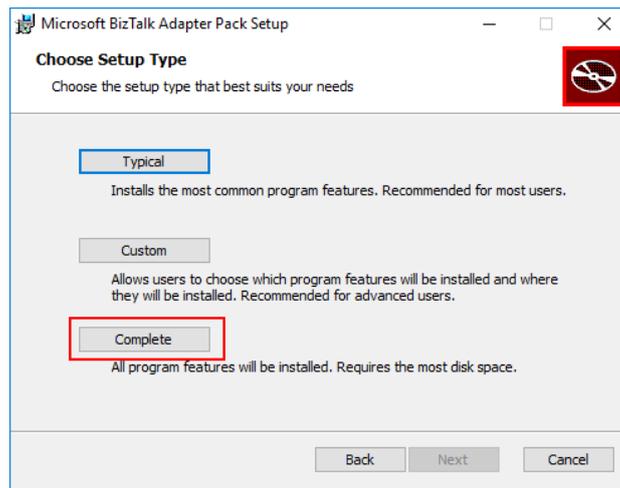
- On the Welcome to the Microsoft BizTalk Adapter Pack Setup Wizard page, click “Next”



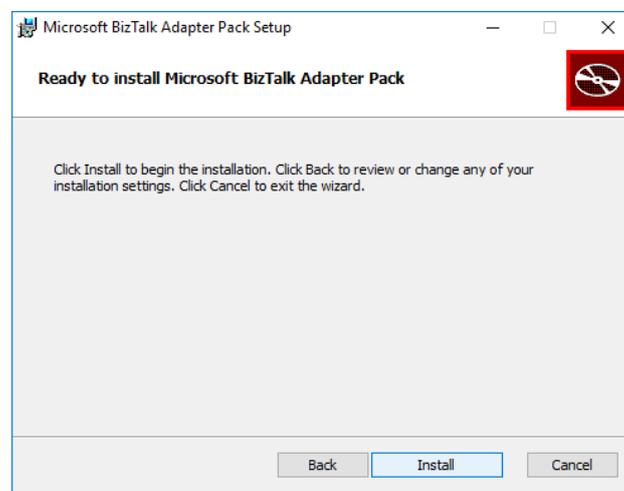
- On the End-User License Agreement page, select “I accept the terms in the License Agreement” to accept the license agreement and click “Next”



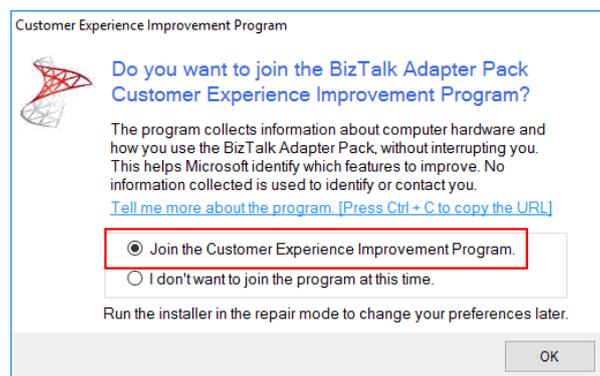
- In the Choose Setup Type page, select the installation type “Complete”:
 - Typical: will install the common run time and tools,
 - Custom: will allow you to select the features that you want to install and the installation location.
 - Complete: will install all the features.



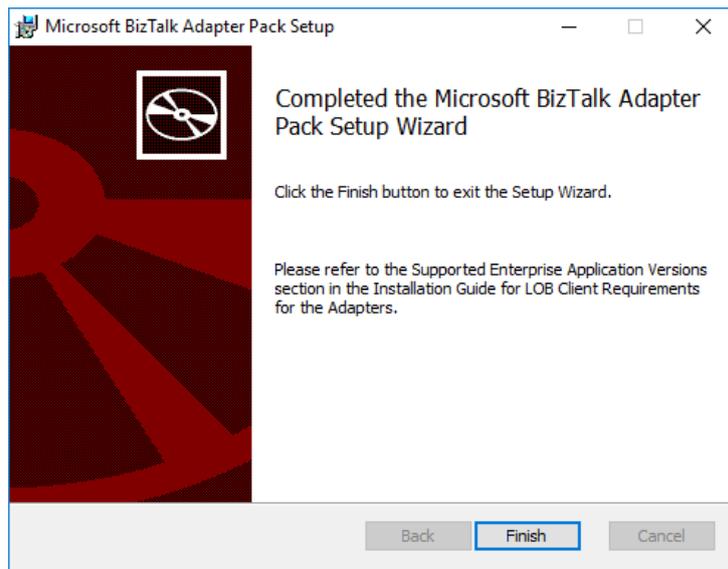
- On the Ready to install Microsoft BizTalk Adapter Pack page, click “Install”



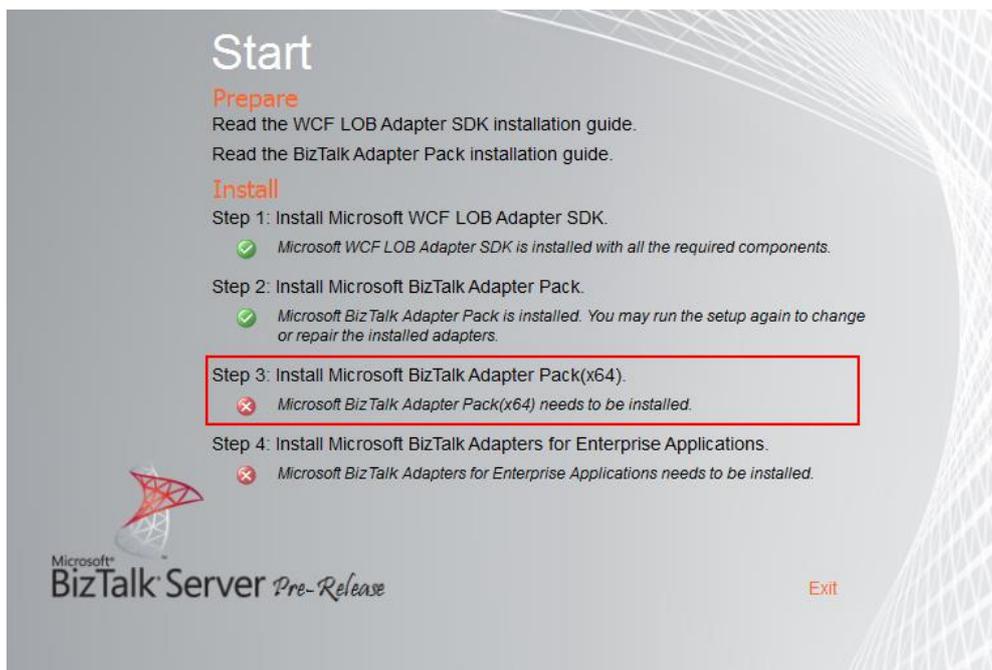
- On the Customer Experience Improvement Program page, select if you want to join the customer experience improvement program or not and click “OK”



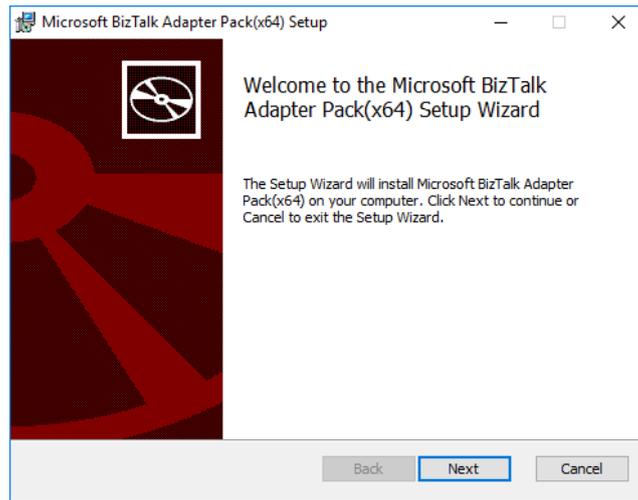
- On the Completed the Microsoft BizTalk Adapter Pack Setup Wizard page, click “Finish”



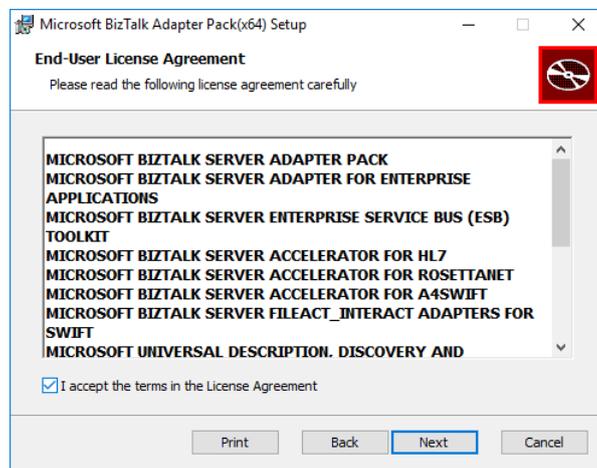
- Back to the Start page, the next step is installing the Microsoft BizTalk Adapter Pack (x64) - note that before you install this pack you have to install x86 first - select the “Step 3. Install Microsoft BizTalk Adapter Pack(x64)”. An installer of SDK is launched.



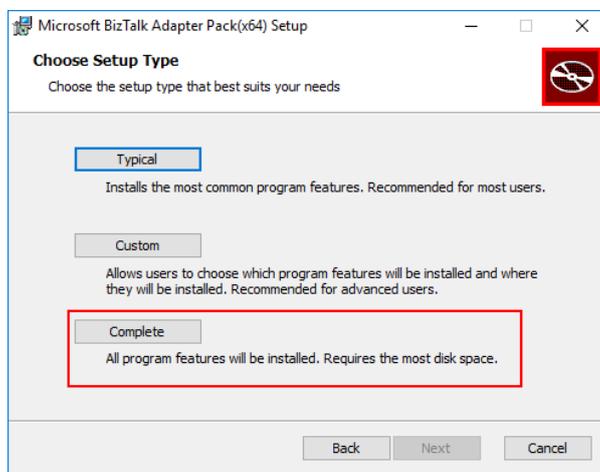
- On the Welcome to the Microsoft BizTalk Adapter Pack(x64) Setup Wizard page, click “Next”



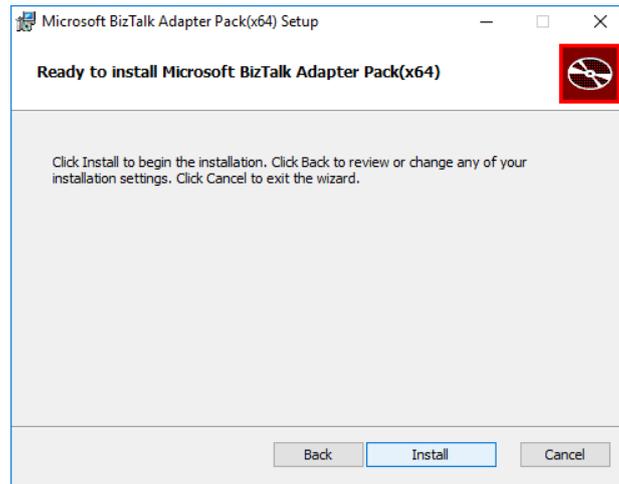
- On the End-User License Agreement page, select “I accept the terms in the License Agreement” to accept the license agreement and click “Next”



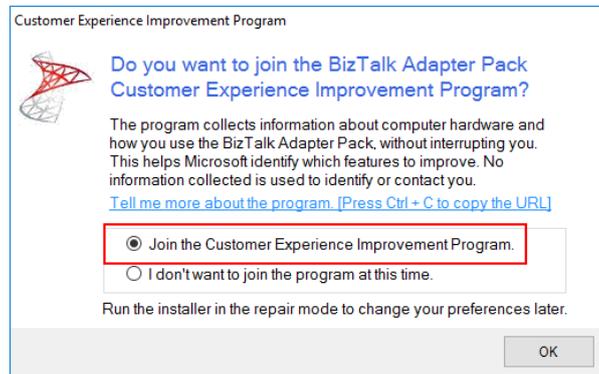
- In the Choose Setup Type page, select the installation type “Complete”:
 - Typical: will install the common run time and tools,
 - Custom: will allow you to select the features that you want to install and the installation location.
 - Complete: will install all the features.



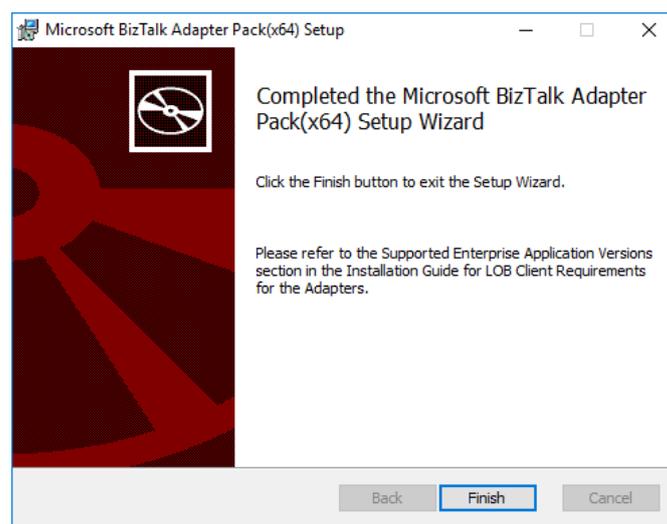
- On the Ready to install Microsoft BizTalk Adapter Pack(x64) page, click “Install”



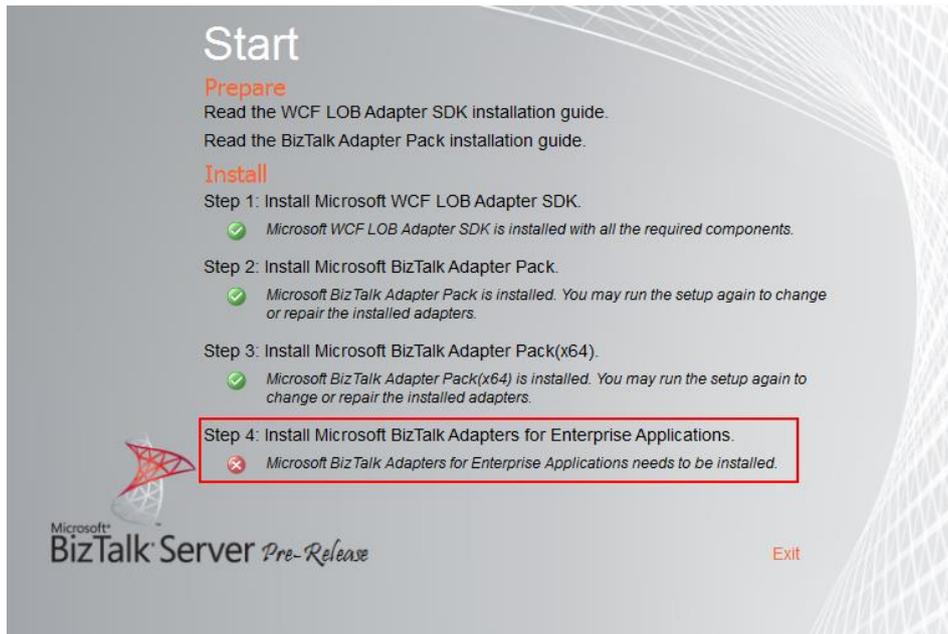
- On the Customer Experience Improvement Program page, select if you want to join the customer experience improvement program or not and click “OK”



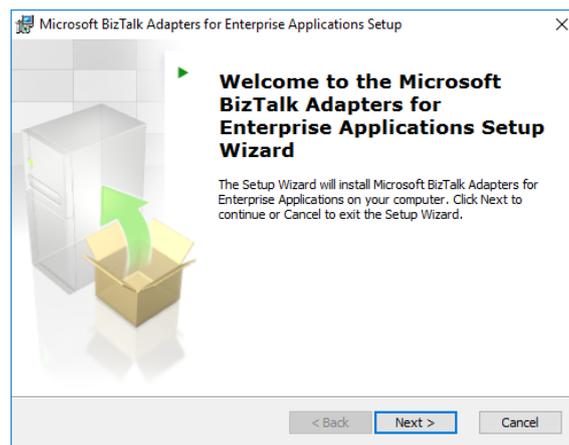
- On the Completed the Microsoft BizTalk Adapter Pack(x64) Setup Wizard page, click “Finish”



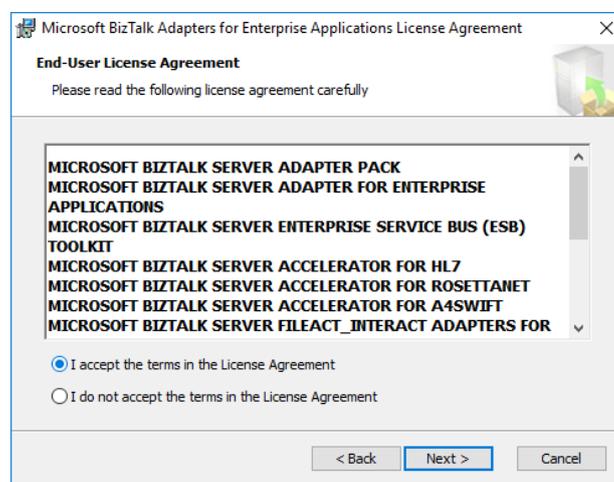
- Back to the Start page, the final step is installing the Microsoft BizTalk Adapters for Enterprise Applications, select the “Step 4. Install Microsoft BizTalk Adapters for Enterprise Applications”. An installer of SDK is launched.



- On the Welcome to the Microsoft BizTalk Adapters for Enterprise Applications Setup Wizard page, click “Next”



- On the End-User License Agreement page, select “I accept the terms in the License Agreement” to accept the license agreement and click “Next”



- In the Customer Information page, type your User Name and Organization and click “Next” to continue.

Microsoft BizTalk Adapters for Enterprise Applications Setup

Customer Information

Please enter your customer information

User Name:
Sandro Pereira

Organization:
Sandro Pereira

< Back Next > Cancel

- In the Choose Setup Type page, select the installation type “Complete”:

 - Custom: will allow you to select the features that you want to install and the installation location.
 - Complete: will install all the features.

Microsoft BizTalk Adapters for Enterprise Applications Setup Type

Choose Setup Type

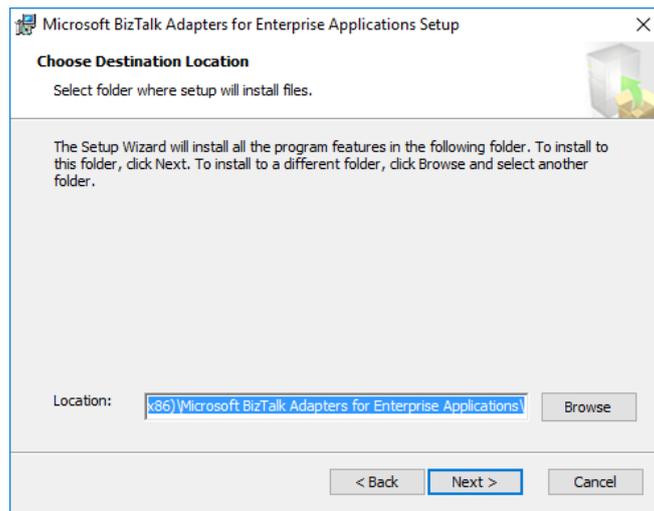
Choose the setup type that best suits your needs

Custom
Allows users to choose which program features will be installed and where they will be installed. Recommended for advanced users.

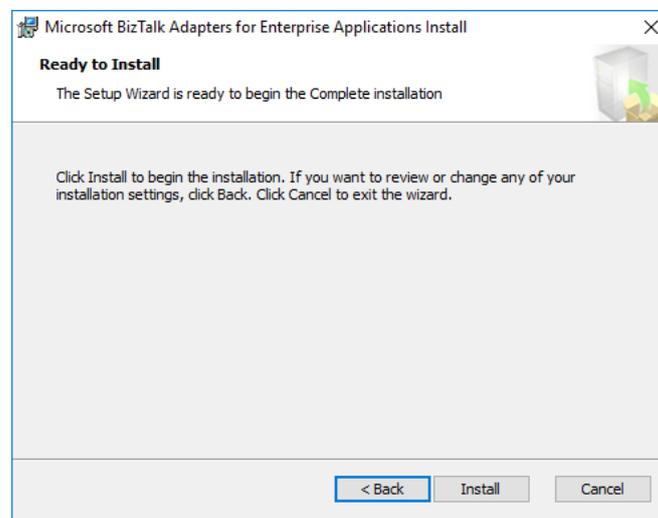
Complete
All program features will be installed. (Requires most disk space)

< Back Next > Cancel

- On the Choose Destination Location page, choose the folder location that to want to install this features and click “Next”



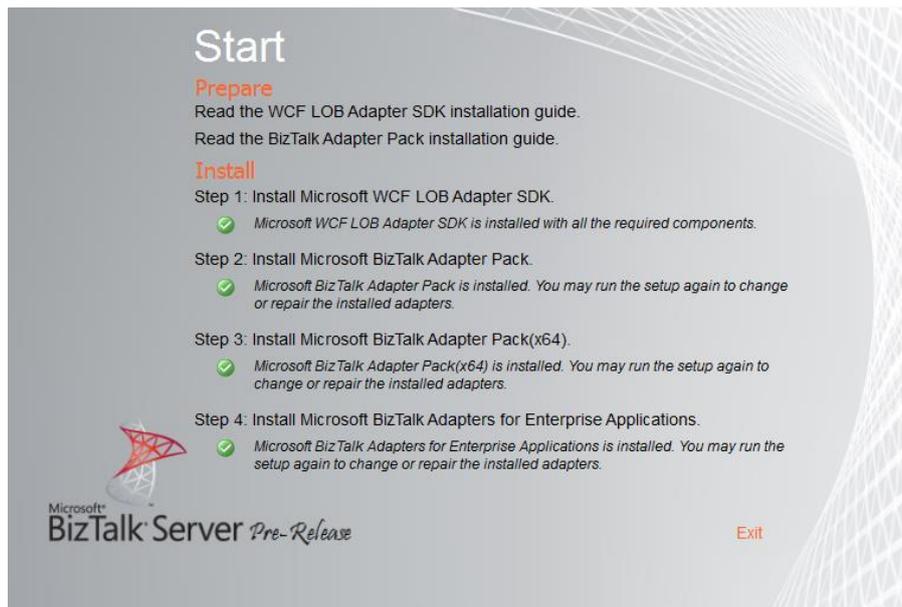
- On the Ready to install page, click "Install"



- On the Completed the Microsoft BizTalk Adapters for Enterprise Applications Setup Wizard page, click "Finish"



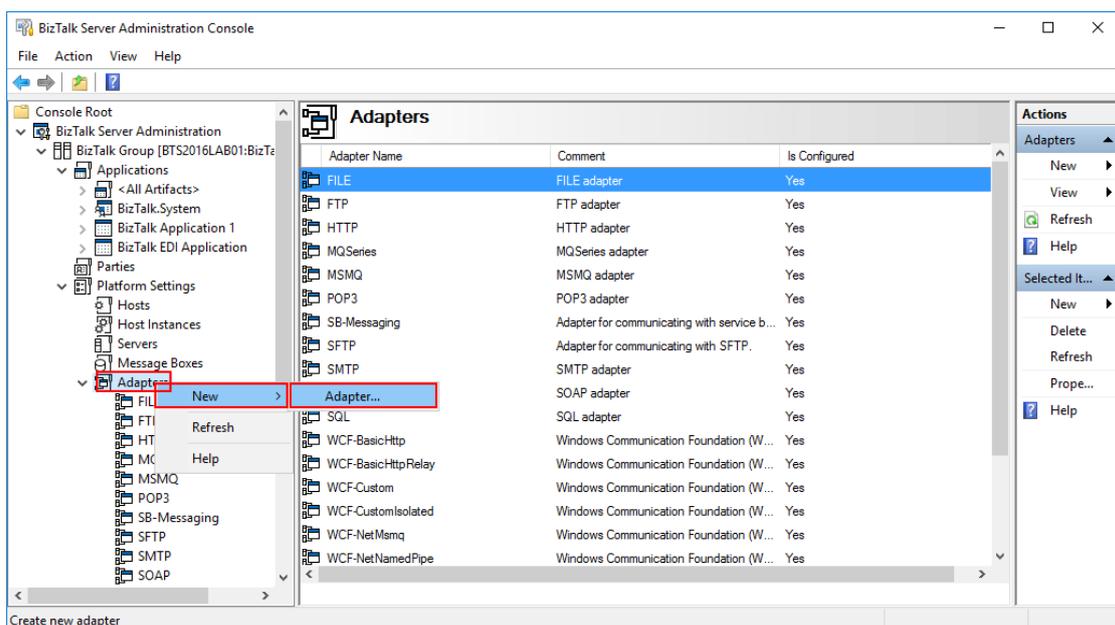
- Close the Start page, click "Exit".



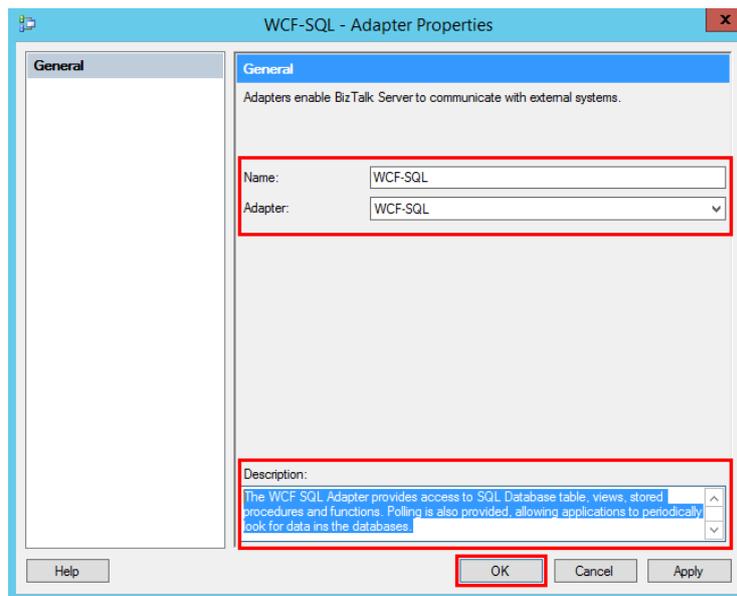
Add adapters to BizTalk Administration Console

As it happens with all adapters that we install on our BizTalk Servers environment, before we can begin to use them we need to register or add the adapters. So in the next step it will be described how can we add the enterprise adapters, or any other custom adapter, on the BizTalk Administration Console. To accomplish that we need to:

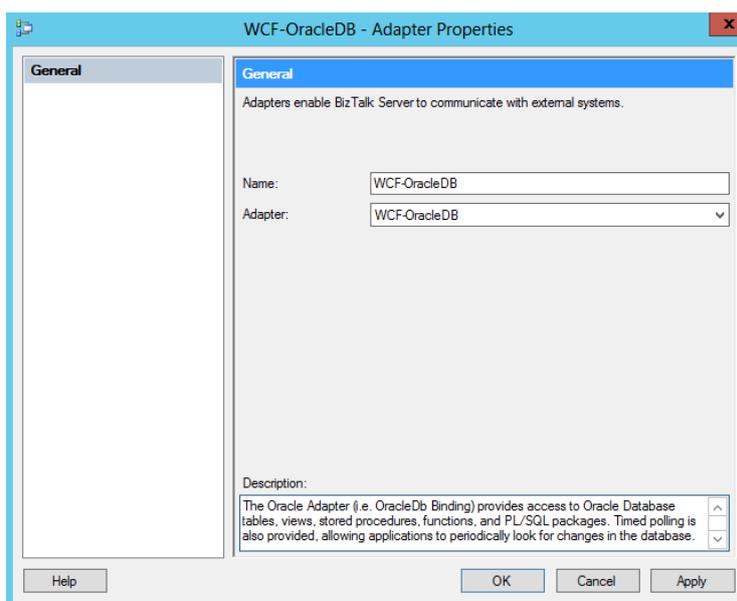
- Open BizTalk Administration Console by pressing the “Windows key” to switch to the Start menu, type “BizTalk Server Administration” or “BizTalk”, click “BizTalk Server Administration” option from the Search window
- In the console left tree, expand “BizTalk Server Administration -> BizTalk Group -> Platform Settings” and then “Adapters”
- Right-click on “Adapters” and add a new adapter by selecting the option “New -> Adapter”



- In the “Adapter Properties” window
 - In the Name box, type a descriptive name for this adapter.
 - WCF-SQL
 - In the Adapter combo box, select the adapter from the drop-down that you want to add.
 - WCF-SQL
 - In the Description box, type a description for the adapter (this is optional).
 - The WCF-SQL Adapter provides access to SQL Server Database tables, views, stored procedures and functions. Polling is also provided, allowing applications to periodically look for data in databases.
 - Click “OK” to complete the process of adding the adapter.



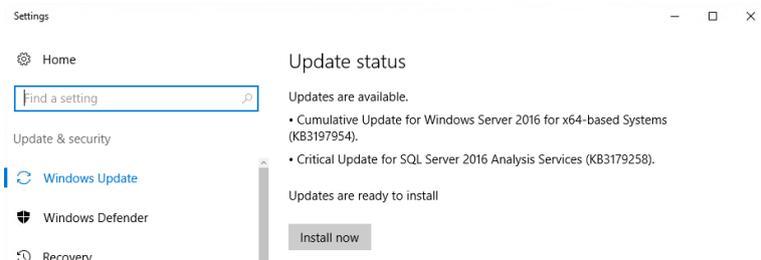
- Repeat steps to add the other adapters.



NOTE: This configuration requires that you restart the host instance associated with the adapters.

Install Critical Windows Updates and BizTalk Server Cumulative Update Package

Once again, after you finish installing all the components, I check and install all Windows update if available and install the latest BizTalk Cumulative Update package and if necessary restart the server (note that this step is not necessary).



However, I would like to mention that until this date there isn't any Cumulative Update for BizTalk Server 2016.

Configure BizTalk Server SQL Jobs

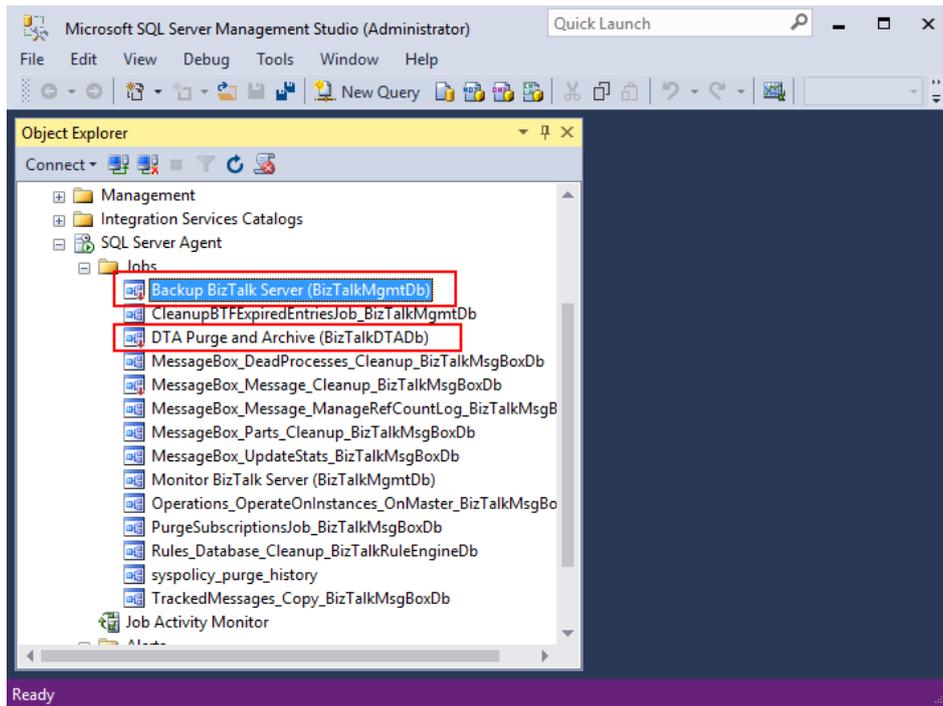
BizTalk Server databases and their health are very important for a successful BizTalk Server database messaging environment. Although there can be many settings that we can configure, like auto-growth settings for BizTalk Databases (you can learn more here), there are two main things that we must understand and be aware, especially the database administrators:

- Execution of the BizTalk Server SQL Agent jobs are crucial for managing the BizTalk Server databases and for maintaining optimal performance.
- The Backup BizTalk Server job is the only supported method to back up the BizTalk Server databases and requires that all of the BizTalk Server databases are configured to use the SQL Server full recovery model.

BizTalk is shipped out with a total of 13 SQL Agent jobs. By default, the following BizTalk jobs aren't configured and enabled upon installation.

- Backup BizTalk Server (BizTalkMgmtDb)
- DTA Purge and Archive (BizTalkDTADb)
- MessageBox_Message_Cleanup_BizTalkMsgBoxDb

The two jobs that needs configuration are the two most important jobs: the "**Backup BizTalk Server**" and the "**DTA Purge and Archive**". If you want these functionalities, you must configure and enable them.



How to configure Backup BizTalk Server (BizTalkMgmtDb)

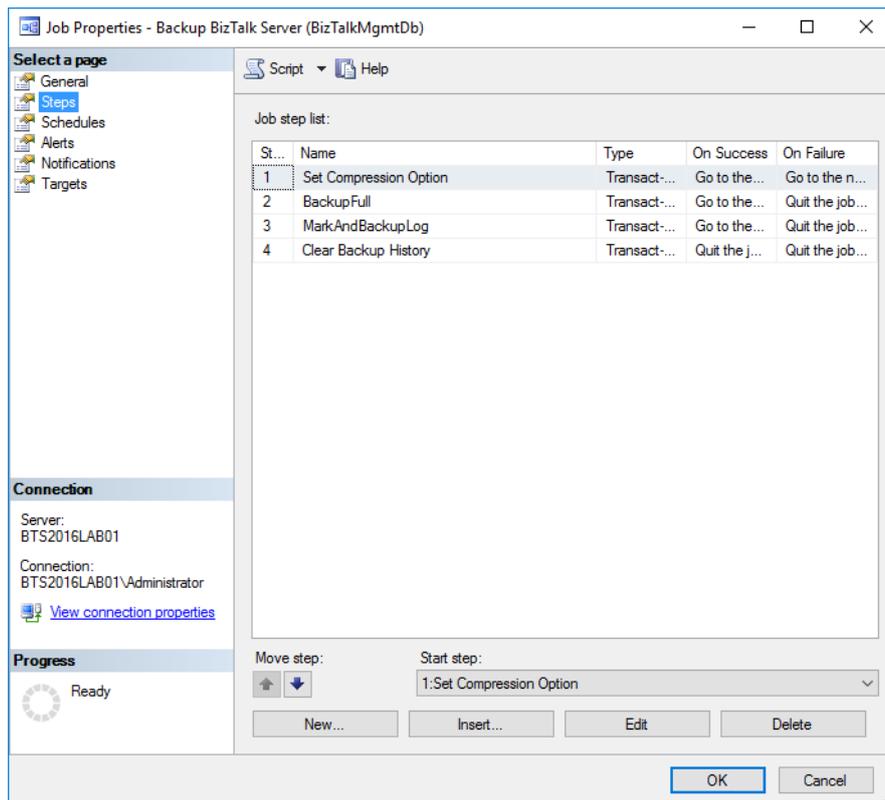
This is the job provided by Microsoft to do a best practice backup of the BizTalk databases. This job has to be configured for it to be able to run.

This Job consists of four steps:

- Step 1 – Set Compression Option – Enable or disable compression during backup.
- Step 2 – BackupFull – Performs full database backups of the BizTalk Server databases.
- Step 3 – MarkAndBackUpLog – Backs up the BizTalk Server database logs.
- Step 4 – Clear Backup History – Specifies for how long the backup history is kept.

To configure the Backup BizTalk Server job:

- Press the “Windows key” to open the Start menu, type “SQL Management” or “SQL” and click in “SQL Server 2016 Management Studio” option to switch to the Start menu.
- In Object Explorer panel, connect to the SQL Server instance and expand the server tree.
 - Expand the “SQL Server Agent” node
 - Expand “Jobs” node
- Double click “Backup BizTalk Server (BizTalkMgmtDb)” to open the job properties window.
- In the Job Properties - Backup BizTalk Server (BizTalkMgmtDb) dialog box, under “Select a page”, click “Steps”.
- In the “Job step list”, click in the job you want to edit, and then click “Edit”



Step 1 – Set Compression Option

Since BizTalk Server 2010, BizTalk Server supports compression for its SQL Server database backups thereby providing some benefits like: less space needed for the backup files, fewer I/O operations for the backup and restore and so on.

This job step calls a stored procedure named `sp_SetBackupCompression` on the BizTalk management database (BizTalkMgmtDb by default) to set the value on the `adm_BackupSettings` table.

The original script is:

```
exec [dbo].[sp_SetBackupCompression] @bCompression = 0 /*0 - Do not use Compression, 1 - Use Compression */
```

The stored procedure has only one parameter:

- `@bCompression`: By default, Set Compression Option is set to 0, which makes backup compression off by default. To change the default, change Set Compression Option to 1.

Change the script to:

```
exec [dbo].[sp_SetBackupCompression] @bCompression = 1 /*0 - Do not use Compression, 1 - Use Compression */
```

Step 2 – BackupFull

The BackupFull step is responsible for performing a full backup of the database.

The original script is:

```
exec [dbo].[sp_BackupAllFull_Schedule] 'd' /* Frequency */, 'BTS' /* Name */, '<destination path>'
/* location of backup files */
```

Where:

- Frequency: The default is d (daily). This is the recommended setting. Other values include h (hourly), w (weekly), m (monthly), or y (yearly).
- Name: The default is BTS. The name is used as part of the backup file name.
- Location of backup files: Replace '<destination path>' with the full path (the path must include the single quotes) to the computer and folder where you want to back up the BizTalk Server databases.

There are also three optional parameters:

- Force full backup after partial backup failures (@ForceFullBackupAfterPartialSetFailure): The default is 0 when not specified, which means that if a log backup fails, no full backups are done until the next full backup frequency interval is reached.
 - Replace with 1 if you want a full backup to be made whenever a log backup failure occurs.
- Local time hour for the backup process to run (@BackupHour): The default is NULL when not specified, which means that backup job will not be associated with the time zone of the BizTalk Server computer and will run at midnight UTC time (0000).
 - If you want to backup to run at a particular hour in the time zone of the BizTalk Server computer, specify an integer value from 0 (midnight) to 23 (11 PM) as the local time hour for the BackupHour parameter.
- Use local time (@UseLocalTime): This is an extra parameter that you can also add that tells the procedure to use local time. The default value is 0.
 - If set to 0, then it uses current UTC time – GETUTCDATE() – 2007-05-04 01:34:11.933
 - If set to 1, then it uses local time – GETDATE() – 2007-05-03 18:34:11.933

Change the script to:

```
exec [dbo].[sp_BackupAllFull_Schedule] 'd' /* Frequency */, 'BTS' /* Name */,
'<your_destination_path>\BizTalk Database\Full' /* location of backup files */
```

Step 3 – MarkAndBackUpLog

The MarkAndBackupLog step is responsible for marking the logs for backup, and then backing them up.

The original script is:

```
exec [dbo].[sp_MarkAll] 'BTS' /* Log mark name */, '<destination path>' /* location of backup files
*/
```

Where:

- @MarkName: Log mark name is part of the naming convention for backup files:
 - <Server Name>_<Database Name>_Log_< Log Mark Name >_<Timestamp>
- @BackupPath: You must change the destination path this to a valid one. It may be local or a UNC path to another server.

There is also one optional parameter:

- @UseLocalTime: This is an extra parameter that you can also add that tells the procedure to use local time
 - `exec [dbo].[sp_MarkAll] 'BTS' /* Log mark name */, '<destination path>' /*location of backup files */ , 1`

Change the script to:

```
exec [dbo].[sp_MarkAll] 'BTS' /* Log mark name */, '< your_destination_path>\BizTalk
Database\Logs' /* location of backup files */
```

Step 4 – Clear Backup History

The Clear Backup History step is responsible for perform a cleanup of the backup history according for how long a backup should be kept.

The original script clears out the instances in the MarkLog table older than 14 days:

```
exec [dbo].[sp_DeleteBackupHistory] @DaysToKeep=14
```

Where:

- @DaysToKeep: specifies how long the backup history is kept in the Adm_BackupHistory table. Periodically clearing the backup history helps to maintain the Adm_BackupHistory table at an appropriate size.
 - The default value for the DaysToKeep parameter is 14 days.

There is also one optional parameter:

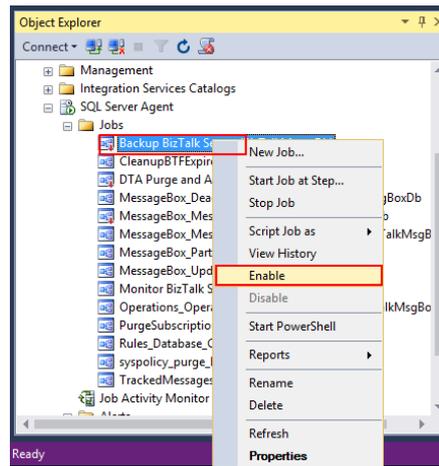
- @UseLocalTime: This is an extra parameter that you can also add that tells the procedure to use local time
 - `exec [dbo].[sp_DeleteBackupHistory] @DaysToKeep=14 , @UseLocalTime =1`

In this particular case I like to leave the default settings.

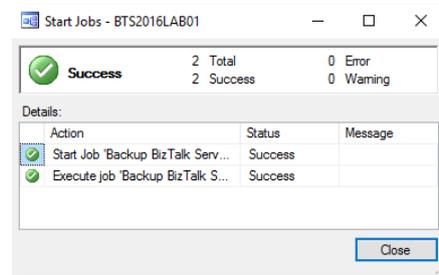
IMPORTANT NOTE: This job step does not provide functionality for deleting backup files that have accumulated over time. You can solve this problem by implementing your custom `sp_DeleteBackupHistory` or by creating a Maintenance Plan to delete BizTalk Database Backups files (see more details [OPTIMIZE THE BIZTALK SERVER 2016 ENVIRONMENT](#))

After properly configure, to enable the Backup BizTalk Server job:

- Under “Jobs” in SQL Server Management Studio Object Explorer, Right click in the name of the job “Backup BizTalk Server (BizTalkMgmtDb)” and select “Enable” option.



- In the result screen, click “Close”.
- For checking if is proper configured, right click in the name of the job “Backup BizTalk Server (BizTalkMgmtDb)” and select “Start Job at Step...” option.



How to configure DTA Purge and Archive (BizTalkDTADb)

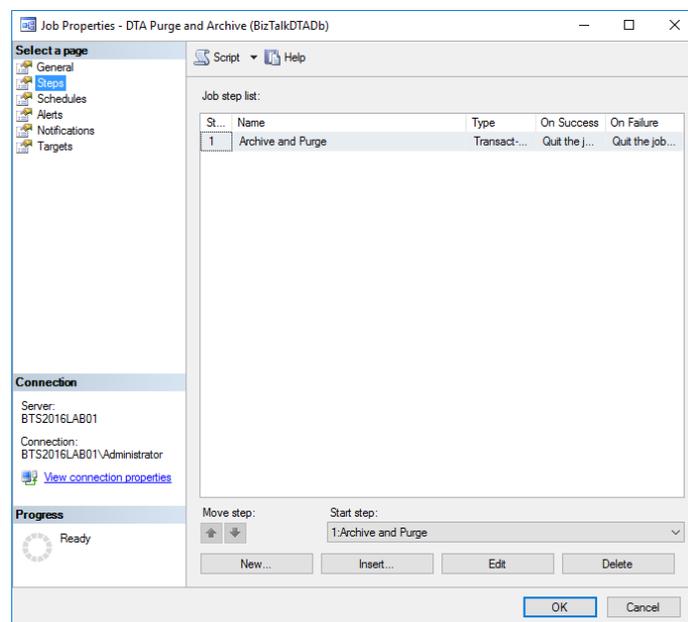
This job automates the archiving of tracked messages and the purging of the BizTalk Tracking database to maintain a healthy system and to keep the tracking data archived for future use.

It is configured to call the stored procedure dtasp_BackupAndPurgeTrackingDatabase, which uses the six parameters you must configure in this job:

- @nLiveHours: Any completed instance older than the (live hours) + (live days) will be deleted along with all associated data. Default is 0 hours.
- @nLiveDays: Any completed instance older than the (live hours) + (live days) will be deleted along with all associated data. Default interval is 1 day.
- @nHardDeleteDays: All data (even if incomplete) older than this will be deleted. The time interval specified for HardDeleteDays should be greater than the live window of data. The live window of data is the interval of time for which you want to maintain tracking data in the BizTalk Tracking (BizTalkDTADb) database. Anything older than this interval is eligible to be archived at the next archive and then purged. Default is 30 days.
- @nvcFolder: Folder in which to put the backup files.
- @nvcValidatingServer: Server on which validation will be done. NULL value indicates no validation is being done. Default is NULL.
- @fForceBackup: Default is 0. This is reserved for future use.

To configure the DTA Purge and Archive job:

- Start by running the “SQL Server 2016 Management Studio”, if it is not already open, Press the “Windows key” to open the Start menu, type “SQL Management” or “SQL” and click in “SQL Server 2016 Management Studio” option from the Search window.
- In Object Explorer panel, connect to the SQL Server instance and expand the server tree.
 - Expand the “SQL Server Agent” node
 - Expand “Jobs” node
- Double click “DTA Purge and Archive (BizTalkDTADb)” to open the job properties window.
- In the Job Properties - DTA Purge and Archive (BizTalkDTADb) dialog box, under “Select a page”, click “Steps”.
- In the “Job step list”, click Archive and Purge, and then click Edit.



The original script after installing BizTalk looks like this:

```
exec dtasp_BackupAndPurgeTrackingDatabase
0, --@nLiveHours tinyint, --Any completed instance older than the live hours +live days
1, --@nLiveDays tinyint = 0, --will be deleted along with all associated data
30, --@nHardDeleteDays tinyint = 0, --all data older than this will be deleted.
null, --@nvcFolder nvarchar(1024) = null, --folder for backup files
null, --@nvcValidatingServer sysname = null,
0 --@fForceBackup int = 0 --
```

This means that:

- Any completed instance that is older than the live days plus live hours will be deleted, as will any associated data.
- Any data older than the HardDeleteDays will be deleted.

Normally I use these configurations for production environments:

```
exec dtasp_BackupAndPurgeTrackingDatabase 0, 10, 20, '<destination path>', null, 0
```

However, in a development machine we don't need to maintain the archived tracking data, so I just purge it periodically. BizTalk gives you the option to Archive and Purge the tracking data or just simply purge the data without archiving:

- Change the SQL Statement inside "DTA Purge and Achieve" SQL Job to

```
declare @dtLastBackup datetime set @dtLastBackup = GetUTCDate() exec
dtasp_PurgeTrackingDatabase 1, 0, 7, @dtLastBackup
```

After properly configured, enable the DTA Purge and Archive job:

- Under "Jobs" in SQL Server Management Studio Object Explorer, Right click in the name of the job "DTA Purge and Archive (BizTalkDTADB)" and select "Enable" option.
- In the result screen, click "Close".

MessageBox_Message_Cleanup_BizTalkMsgBoxDb

This job removes all messages that are not referenced by any subscribers in the BizTalkMsgBoxDb database tables.

IMPORTANT NOTE: This job is also started by the MessageBox_Message_ManageRefCountLog_BizTalkMsgBoxDb job. Therefore, we recommend that you keep this job disabled.

5 Optimize the BizTalk Server 2016 environment

This part of the article will focus on optimizing some BizTalk Server 2016 configurations. The following recommendations can be used to increase BizTalk Server performance or just to make the platform more resilient to failures. The optimizations listed in this topic are applied after BizTalk Server has been installed and configured.

Deleting BizTalk backup files

BizTalk Server databases and their health are very important for a successful BizTalk Server database messaging environment. BizTalk is shipped out with a total of 13 SQL Agent jobs. By default, the following BizTalk jobs aren't configured and enabled upon installation and the two jobs that needs configuration are the two most important jobs: the "**Backup BizTalk Server**" and the "**DTA Purge and Archive**". This is nothing new and everybody knows!

However, what many times we forget is that this two jobs, by default, **don't provide functionality for deleting backup files that have accumulated over time on our file system** and we normally forget to create a "process" or a "job" to accomplish this until it is too late. The result of that is... lots of times we just remember when the disks are full and everything stops to work!

You can solve this problem by implementing your custom `sp_DeleteBackupHistory` or by creating a Maintenance Plan to delete BizTalk Database Backups files.

Implementing a custom `sp_DeleteBackupHistory`

To implement a custom `sp_DeleteBackupHistory` you need to:

- Start SQL Server Management Studio, and then connect to the BizTalk Management Database. By default, this database is named BizTalkMgmtDb.
- Click New Query to open a Query Editor window.
- Run the following Transact-SQL script to create the `sp_DeleteBackupHistoryAndFiles` stored procedure:

```
CREATE PROCEDURE [dbo].[sp_DeleteBackupHistoryAndFiles] @DaysToKeep smallint = null
AS
BEGIN
    set nocount on
    IF @DaysToKeep IS NULL OR @DaysToKeep <= 1
        RETURN
    /* Only delete full sets
    If a set spans a day in such a way that some items fall into the deleted group and the other does
    not, do not delete the set */
    DECLARE DeleteBackupFiles CURSOR
    FOR SELECT 'del "' + [BackupFileLocation] + '\' + [BackupFileName] + "' FROM
[adm_BackupHistory]
    WHERE datediff(dd, [BackupDateTime], getdate()) >= @DaysToKeep
    AND [BackupSetId] NOT IN (SELECT [BackupSetId] FROM [dbo].[adm_BackupHistory] [h2]
```

```

WHERE [h2].[BackupSetId] = [BackupSetId] AND datediff(dd, [h2].[BackupDateTime], getdate()) <
@DaysToKeep)
DECLARE @cmd varchar(400)
OPEN DeleteBackupFiles
FETCH NEXT FROM DeleteBackupFiles INTO @cmd
WHILE (@@fetch_status <> -1)
BEGIN
  IF (@@fetch_status <> -2)
  BEGIN
    EXEC master.dbo.xp_cmdshell @cmd, NO_OUTPUT
    delete from [adm_BackupHistory] WHERE CURRENT OF DeleteBackupFiles
    print @cmd
  END
  FETCH NEXT FROM DeleteBackupFiles INTO @cmd
END
CLOSE DeleteBackupFiles
DEALLOCATE DeleteBackupFiles
END
GO

```

- Change the “Clear Backup History” step of the Backup BizTalk Server job so that it calls the sp_DeleteBackupHistoryAndFiles stored procedure instead of the sp_DeleteBackupHistory stored procedure.

However, I personally don’t like this approach for two main reasons:

- I prefer to avoid changing the scripts of BizTalk standard jobs
- And I also believe that this approach is very limited and doesn’t allow the flexibility that we all want.

Instead I really prefer to take advantage of all features that SQL gives me and create a maintenance plan with a Cleanup task to remove this files.

Implementing a Maintenance Plan to clean BizTalk Database backup’s files

Maintenance Plans allow DBA’s to have flexibility to create a workflow to execute several tasks required to make sure that the database is optimized, regularly backed up, and free of inconsistencies. However almost all of these tasks are warranted by the existing BizTalk jobs and I will not use them. The only thing we need is to create a task to clean BizTalk Database backup files from our file system.

The main advantage of this approach is that will allow us more flexibility for further changes and we can also use them to other backups that we have.

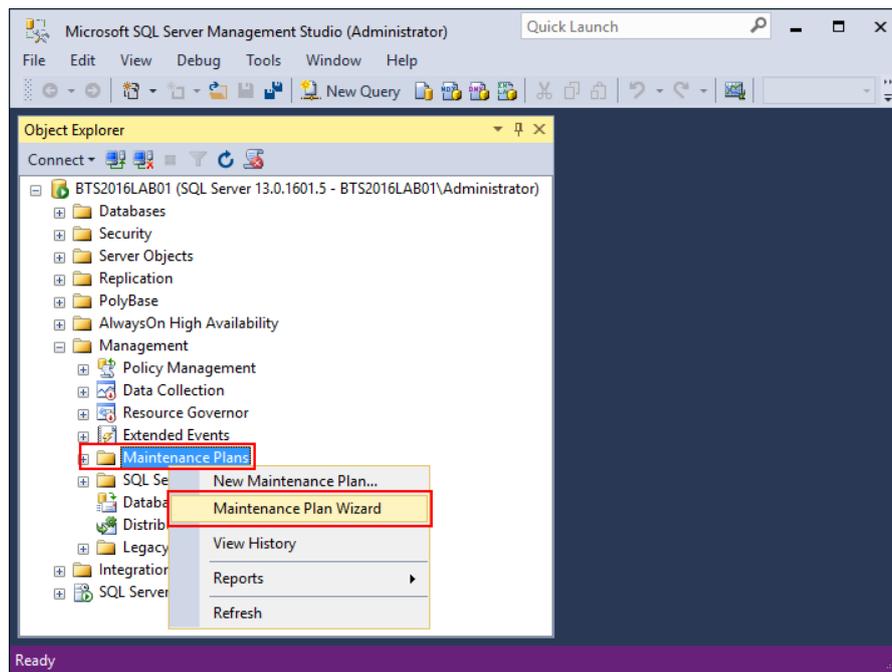
NOTE: You should ensure that SQL Server Agent service is running because the maintenance plans depend on the Microsoft SQL Server Agent in order to run on a regular basis.

IMPORTANT NOTE: this example is created to run in a developer machine, so if you are implementing this approach in production environments make sure to keep the backups for the time you see that fit your requirements or make sure the backups are saved in an external

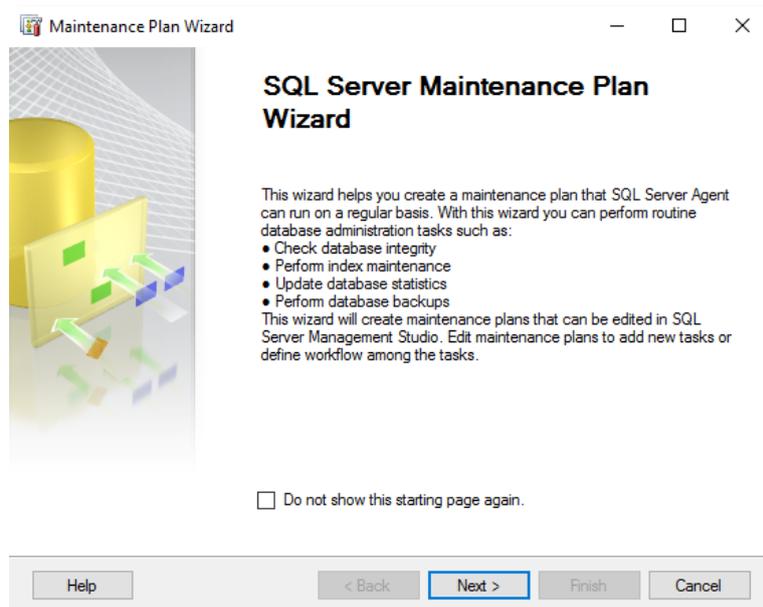
storage before you delete these files from the file system.

To create the maintenance plan you need to:

- Open the SQL Server Management Studio by pressing the “Windows key” to switch to the Start menu, type “SQL” or “SQL Management” and click in “SQL Server 2016 Management Studio” option from the Search window.
- Expand the server and then the “Management” folder.
- Right-click “Maintenance Plans” and select “Maintenance Plan Wizard”. This launches the wizard and you can now step through and create a plan customized to meet your maintenance requirements.



- On the SQL Server Maintenance Plan Wizard page, click “Next”.



- On the “Select Plan Properties” page:
 - In the “Name”: enter the name of the maintenance plan you are creating.
 - Clean BizTalk Databases Backup’s files
 - In the “Description”: enter a briefly describe your maintenance plan.
 - This will clean BizTalk Database backup’s files form the file system after X day(s)
 - In the “Run as”: specify the credential that Microsoft SQL Server Agent uses when executing the maintenance plan – leave the default.
 - Select “Single schedule for the entire plan or no schedule” to specify the recurring schedule of the maintenance plan.

The screenshot shows the 'Maintenance Plan Wizard' window, specifically the 'Select Plan Properties' step. The window title is 'Maintenance Plan Wizard' and the subtitle is 'Select Plan Properties'. Below the subtitle is the question 'How do you want to schedule your maintenance tasks?'. The form contains the following fields and options:

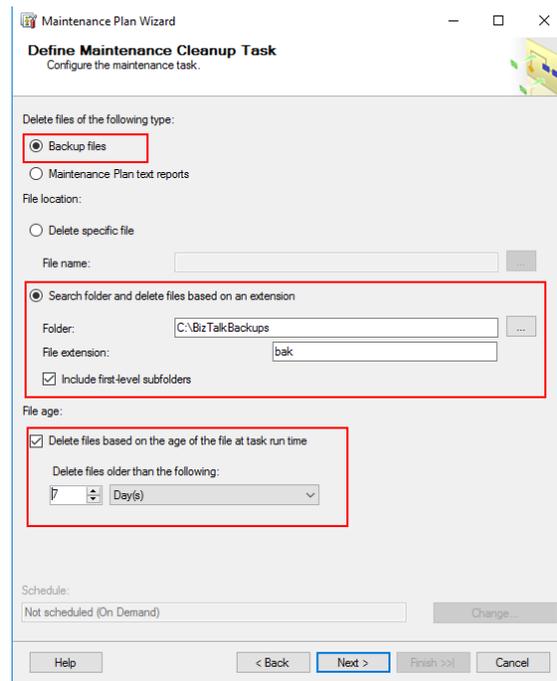
- Name:** A text box containing 'Clean BizTalk Databases Backup's files'.
- Description:** A text box containing 'This will clean BizTalk Database backup's files form the file system after X day(s)'. There are scroll bars on the right side of the box.
- Run as:** A dropdown menu showing 'SQL Server Agent service account'.
- Scheduling Options:** Two radio buttons:
 - Separate schedules for each task
 - Single schedule for the entire plan or no schedule
- Schedule:** A dropdown menu showing 'Not scheduled (On Demand)'. To the right of this dropdown is a 'Change...' button.
- Navigation Buttons:** At the bottom, there are five buttons: 'Help', '< Back', 'Next >', 'Finish', and 'Cancel'. The 'Next >' button is highlighted with a blue border.

- Under Schedule, click “Change...”
 - Under “Frequency”, on the “Occurs” list, select “Daily” and in the “Rekurs every” box, enter how often the job schedule repeats in days: 1 Day.
 - Under “Daily frequency”, select “Occurs once at” and specific the time of day when the job schedule should run: 12:00:00
 - Leave the default values in the rest of the properties and click “OK”

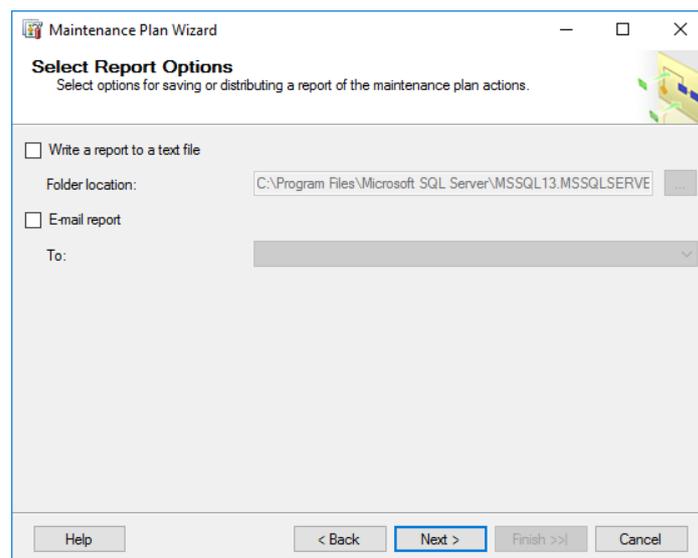
- Back to the Select Plan Properties page, click “Next”
- On the “Select Maintenance Tasks” page, select “Maintenance Cleanup Task” from the list and click “Next”

- On the “Select Maintenance Task Order” page, click “Next” to continue
- On the “Define Maintenance Cleanup Task” page, specify the following properties:
 - Under “Delete files of the following type”: select “Backup files”
 - Select “Search folder and delete files based on an extension” to delete all files with the specified extension in the specified folder
 - Under “Folder”: specify the path and name of the folder containing the files to be deleted.
 - Under “File extension”: Provide the file extension of the files to be deleted.

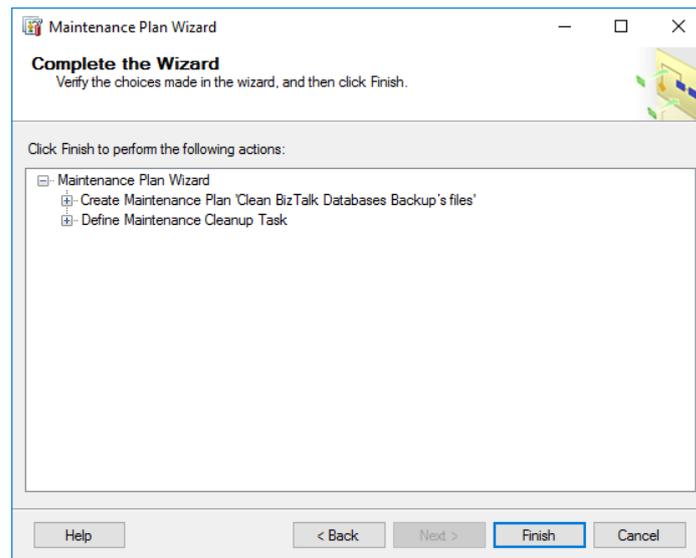
- Select also “Include first-level subfolders” option if to want to delete the files also from first-level subfolders under the folder specified in Folder.
- Select “Delete files based on the age of the file at task run time” and specify the minimum age of the files that you want to delete under “Delete files older than the following” property
 - Specify 1 Day
- Click “Next”



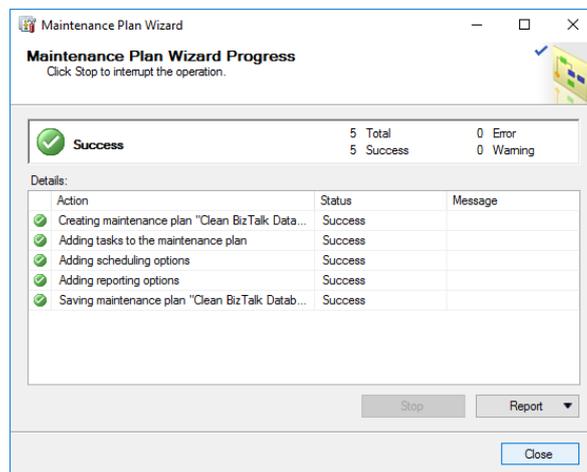
- On the “Select Report Options” page, unselect all options and then click “Next”.



- On the “Complete the Wizard” page, verify the choices made on the previous pages, and click Finish.



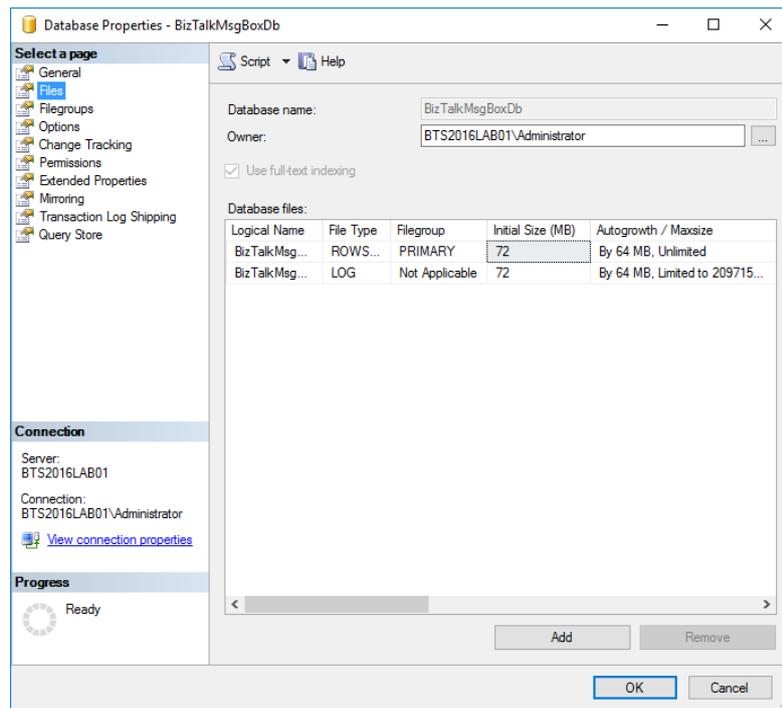
- On the Maintenance Wizard Progress page, verify if every action was successful executed and then click “Close”



Pre-allocate space and define auto-growth settings for BizTalk Server databases

By default, BizTalk Server databases are defined with small files size and with the parameter “Autogrowth” set to:

- Increase by 1 MB or 64 MB for database file
- And by 10% or 64 MB for log file



So what's the problem with these settings?

Auto growth setting plays an important role in BizTalk configuration for performance reasons, why?

SQL Server database auto-growth is a blocking operation which hinders BizTalk Server database performance. When SQL Server increases the size of a file, it must first initialize the new space before it can be used. This is a blocking operation that involves filling the new space with empty pages.

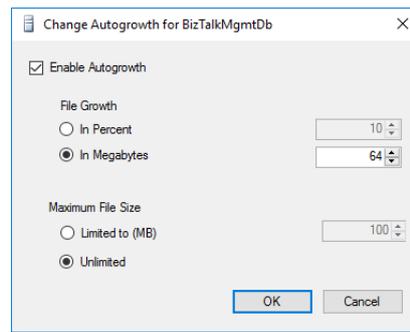
Therefore, it's recommended to:

- Set this value (databases auto-growth) to a fixed value of megabytes instead of to a percentage, so SQL server doesn't waste its resources expanding the data and log files during heavy processing. This is especially true for the MessageBox and Tracking (DTA) databases:
 - In a high throughput BizTalk Server environment, the MessageBox and Tracking databases can significantly increase. If auto-growth is set to a percentage, then auto-growth will be substantial as well.
 - As a guideline for auto-growth, for large files increment should be no larger than 100 MB, for medium-sized files 10 MB, or for small files 1 MB.
 - This should be done in such a way, if auto-growth occurs, it does so in a measured fashion. This reduces the likelihood of excessive database growth.
- Also allocate sufficient space for the BizTalk Server databases in advance to minimize the occurrence of database auto-growth.

How can I implement these optimizations?

You can do these optimizations by two ways:

- Manually, by opening “Microsoft SQL Server Management Studio”
 - Maximize you SQL Server and then Databases
 - Right-click in the database, for example “BizTalkMsgBoxDb” and select “Properties” option
 - On Database Properties window, select Files page option and then you can check and change Autogrowth property associated to database and log file.



However, checking and changing all BizTalk databases manually is too much work and can be a little boring ...

- Or you can do this by running the following SQL Script:

```
ALTER DATABASE BizTalkMgmtDb MODIFY FILE (NAME = BizTalkMgmtDb_log , SIZE = 512MB ,
FILEGROWTH = 100MB)
GO
ALTER DATABASE BizTalkMsgBoxDb MODIFY FILE (NAME = BizTalkMsgBoxDb , SIZE = 2GB ,
FILEGROWTH = 100MB)
GO
ALTER DATABASE BizTalkMsgBoxDb MODIFY FILE (NAME = BizTalkMsgBoxDb_log , SIZE = 2GB ,
FILEGROWTH = 100MB)
GO
ALTER DATABASE SSODB MODIFY FILE (NAME = SSODB , SIZE = 512MB , FILEGROWTH = 100MB)
GO
ALTER DATABASE SSODB MODIFY FILE (NAME = SSODB_log , SIZE = 512MB , FILEGROWTH =
100MB)
GO
ALTER DATABASE BAMPrimaryImport MODIFY FILE (NAME = BAMPrimaryImport , SIZE = 150MB ,
FILEGROWTH = 10MB)
GO
ALTER DATABASE BAMPrimaryImport MODIFY FILE (NAME = BAMPrimaryImport_log , SIZE =
150MB , FILEGROWTH = 10MB)
GO
ALTER DATABASE BAMArchive MODIFY FILE (NAME = BAMArchive , SIZE = 70MB , FILEGROWTH =
10MB)
GO
ALTER DATABASE BAMArchive MODIFY FILE (NAME = BAMArchive_log , SIZE = 200MB ,
FILEGROWTH = 10MB)
GO
ALTER DATABASE BizTalkRuleEngineDb MODIFY FILE ( NAME = BizTalkRuleEngineDb ,
FILEGROWTH = 1024KB )
GO
ALTER DATABASE BizTalkRuleEngineDb MODIFY FILE ( NAME = BizTalkRuleEngineDb_log ,
FILEGROWTH = 1024KB )
GO
```

The execution of this SQL script will automatically set the values for all BizTalk Server databases according to what is recommended. Not only the auto-growth property but also the database and log file size:

- **BizTalkDTADb (BizTalk Tracking database):** Data file having a file size of 2 GB with 100 MB growth and a log file of 1 GB with 100 MB growth.
- **BizTalkMgmtDb (BizTalk Management database):** Data file having a file size of 512 MB with 100 MB growth and a log file of 512 MB with 100 MB growth.
- **SSODB (SSO database):** Data file having a file size of 512 MB with 100 MB growth and a log file of 512 MB with 100 MB growth.
- **BizTalkMsgBoxDb (BizTalk MessageBox database):** Data file having a file size of 2 GB with 100 MB growth and a log file of 2 GB with 100 MB growth.
- **BAMPrimaryImport (BAM Primary Import database):** Data file having a file size of 150 MB with 10 MB growth and a log file of 150 MB with 100 MB growth.
- **BAMArchive (BAM Archive):** Data file having a file size of 70 MB with 10 MB growth and a log file of 200 MB with 10 MB growth.
- **BizTalkRuleEngineDb (Rule Engine database):** Data file with 1 MB growth and a log file with 1 MB growth.

NOTE: These values were used for a standalone environment. In a high throughput BizTalk Server environment, you should consider to divide the BizTalkMsgBoxDb in 8 data files, each having a file size of 2 GB with 100 MB growth and a log file of 20 GB with 100 MB growth. Because the BizTalk MessageBox databases are the most active, we recommend you place the data files and transaction log files on dedicated drives to reduce the likelihood of problems with disk I/O contention, as is explained here: <http://msdn.microsoft.com/en-us/library/ee377048.aspx>

```
EXEC dbo.sp_helpdb BizTalkMsgBoxDb
ALTER DATABASE BizTalkMsgBoxDb MODIFY FILE (NAME = BizTalkMsgBoxDb , FILENAME =
'J:\BizTalkMsgBoxDb.mdf' , SIZE = 2GB , FILEGROWTH = 100MB)
ALTER DATABASE BizTalkMsgBoxDb ADD FILE (NAME = BizTalkMsgBoxDb_2 , FILENAME =
'J:\BizTalkMsgBoxDb_2.ndf' , SIZE = 2GB , FILEGROWTH = 100MB)
ALTER DATABASE BizTalkMsgBoxDb ADD FILE (NAME = BizTalkMsgBoxDb_3 , FILENAME =
'J:\BizTalkMsgBoxDb_3.ndf' , SIZE = 2GB , FILEGROWTH = 100MB)
ALTER DATABASE BizTalkMsgBoxDb ADD FILE (NAME = BizTalkMsgBoxDb_4 , FILENAME =
'J:\BizTalkMsgBoxDb_4.ndf' , SIZE = 2GB , FILEGROWTH = 100MB)
ALTER DATABASE BizTalkMsgBoxDb ADD FILE (NAME = BizTalkMsgBoxDb_5 , FILENAME =
'J:\BizTalkMsgBoxDb_5.ndf' , SIZE = 2GB , FILEGROWTH = 100MB)
ALTER DATABASE BizTalkMsgBoxDb ADD FILE (NAME = BizTalkMsgBoxDb_6 , FILENAME =
'J:\BizTalkMsgBoxDb_6.ndf' , SIZE = 2GB , FILEGROWTH = 100MB)
ALTER DATABASE BizTalkMsgBoxDb ADD FILE (NAME = BizTalkMsgBoxDb_7 , FILENAME =
'J:\BizTalkMsgBoxDb_7.ndf' , SIZE = 2GB , FILEGROWTH = 100MB)
ALTER DATABASE BizTalkMsgBoxDb ADD FILE (NAME = BizTalkMsgBoxDb_8 , FILENAME =
'J:\BizTalkMsgBoxDb_8.ndf' , SIZE = 2GB , FILEGROWTH = 100MB)
GO
ALTER DATABASE BizTalkMsgBoxDb MODIFY FILE (NAME = BizTalkMsgBoxDb_log , FILENAME =
'K:\BizTalkMsgBoxDb_log.LDF' , SIZE = 20GB , FILEGROWTH = 100MB)
GO
```

The script can be found and download on Microsoft TechNet Gallery: [Pre-allocate space and define auto-growth settings for BizTalk Server databases](#)

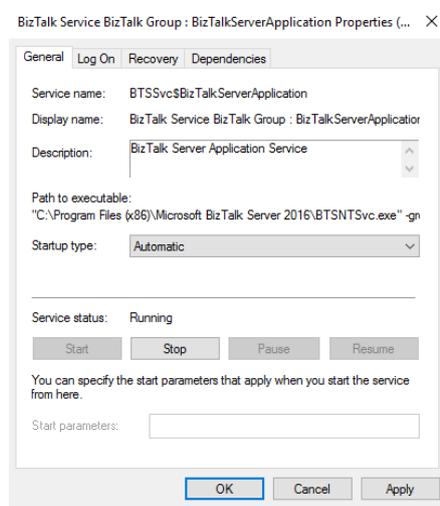
Configure BizTalk Server Windows Services

By default, the “Startup type” propriety of BizTalk Windows Services, Enterprise Single Sign-On Service, Microsoft UDDI Notification Service and the BAMAAlerts service are set as “Automatic”, however some of this Windows Services may not start automatically after a system restart, to avoid this behavior you must configure the “Startup type” to “Automatic (Delayed Start)” option in this services:

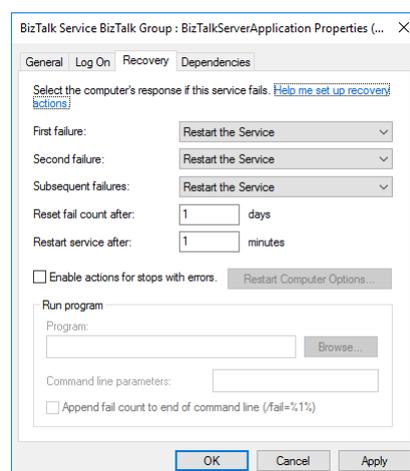
- BAMAAlerts
- Rule Engine Update Service

The previous version of BizTalk Server also had this problem for:

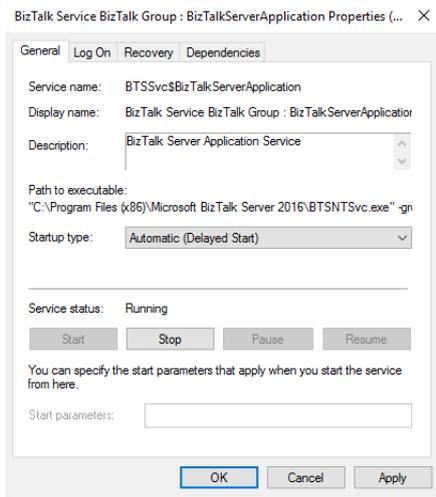
- Enterprise Single Sign-On Service
- BizTalk Service BizTalk Group : BizTalkServerApplication Service



- Despite being configured as “Automatic”, the Recovery properties are configured properly to restart the service after failures

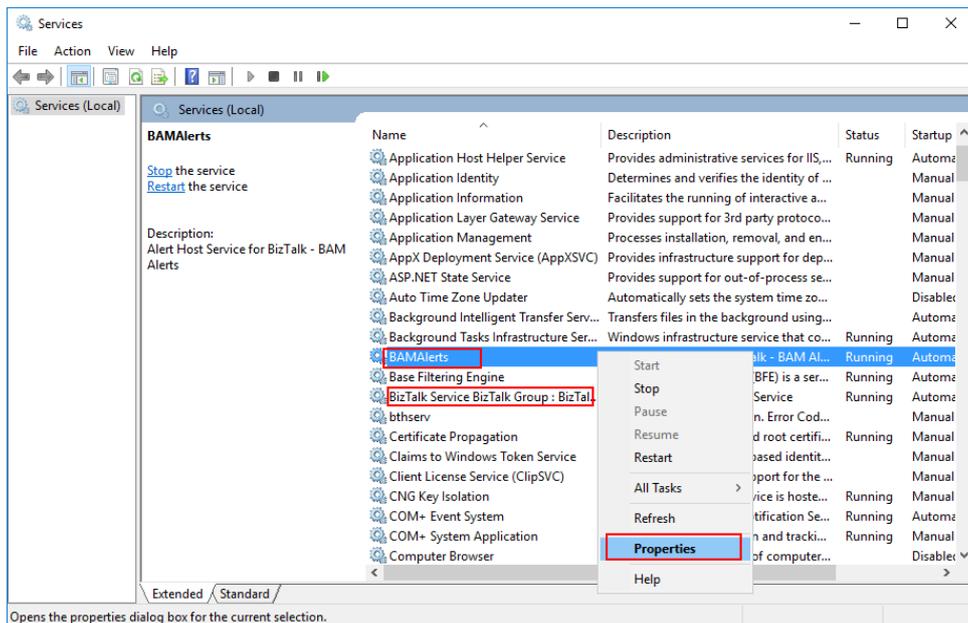


- The Startup type should be changed for “Automatic (Delayed Start)”

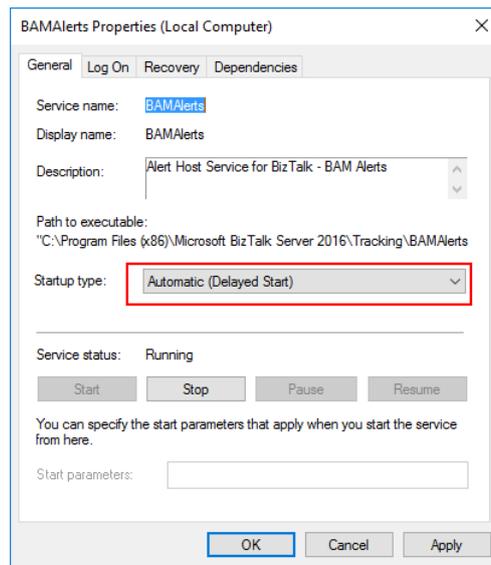


To properly configure the BizTalk Services, “Enterprise Single Sign-On Service” and “BAMAlerts” Windows service:

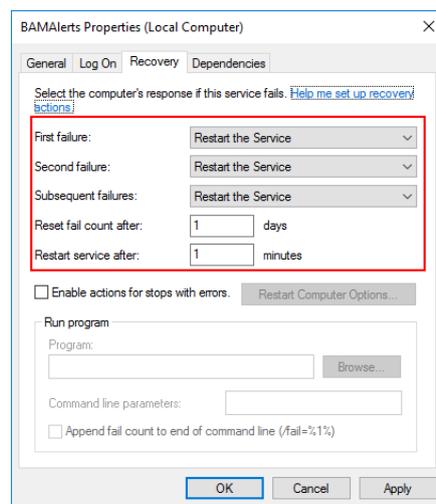
- Press the “Windows key” to open the Start menu, type “Services” and click in “View local services” option from the Search window.
- In the Services window, on the Services (Local) panel select the service for example “BAMAlerts”, right click and select “Properties” option.



- On the BAMAlerts Properties (Local Computer) window:
 - On the General tab apply the following configuration:
 - Startup type: “Automatic (Delayed Start)”



- On the Recovery tab, apply the following configuration:
 - First failure: “Restart the Service”
 - Second failure: “Restart the Service”
 - Subsequent failures: “Restart the Service”
 - Reset fail count after ... day: 1
 - Restart service after ... minutes: 1



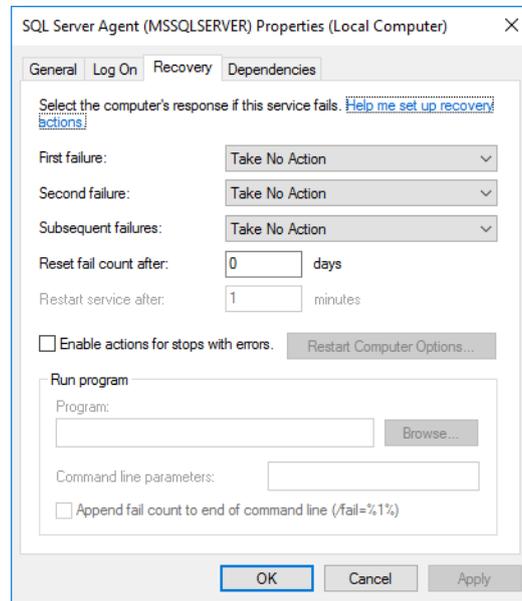
- Click “OK” to apply the changes and close the window
- Repeat the steps for the other services.

You could and should apply the same Recovery properties configurations for the SQL Server services:

- SQL Full-text Filter Daemon Launcher
- SQL Server
- SQL Server Agent
- SQL Server Analysis Services *
- SQL Server Browser
- SQL Server Integration Services *

- SQL Server CEIP service
- SQL Server Launchpad
- SQL Server Reporting Services
- SQL Server VSS Writer

By default, they are configured as “Take No Action”



And should be configured as:

- Startup type: “Automatic”
- and First, Second and Subsequent failures: “Restart the Service”

Install and configure BizTalk Health Monitor

BizTalk Health Monitor is a snap-in, basically it's the same of BizTalk MsgBoxViewer tool that we used to monitor a BizTalk environment by gathering all information of a BizTalk group and detecting any issues, non-critical or critical warnings to detect any potential problems in advance, but in this case it is integrated more closely with the BizTalk Administration Console to provide BizTalk administrators a quick and complete dashboard of a BizTalk group which will help them monitor the health of their BizTalk platform.

You can download the standalone version of BHM from Microsoft Download Center here: [BizTalk Health Monitor](#)

How to install BizTalk Health Monitor Snap-In

After you download and unzip the BHMv*.*.ZIP file from the Microsoft Download Center, you should execute the “BHMSSetup.exe” which comes with BizTalk Health Monitor tool to register the BHM snap in.

IMPORTANT: If exists, you shouldn't replace or create a new BHM folder under “C:\Program Files (x86)\Microsoft BizTalk Server 2016\SDK\Utilities\Support Tools” otherwise it may cause some issues installing upcoming BizTalk cumulative updates.

IMPORTANT NOTE: Install the BHM to its final destination, for example: C:\Program Files (x86)\BizTalkHealthMonitor. Once you install/register the BizTalk Health Monitor Snap-In you cannot delete or change the folder or BHM will stop working.

After you unzip the BHMv*.*.ZIP file you should:

- Run the “BHMSetup.exe” as administrator, by pressing right click over the “BHMSetup.exe” file and select the “Run as administrator” option.
- In the Start panel, set the installation path and then click “Start Installing”



- When the installation complete, click “Exit”.

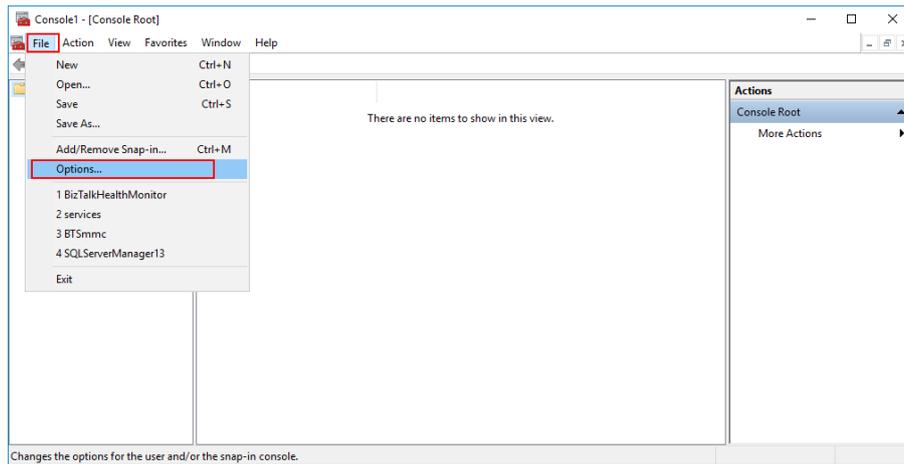
How to integrate BHM Snap-In into BizTalk Admin Console

IMPORTANT NOTE: BHM Snap-In can be used independently and need not to be integrated with BizTalk Administration Console. The handicap of this approach is that a BizTalk Administration will need to use two different places/tools to monitor and administrate the environment.

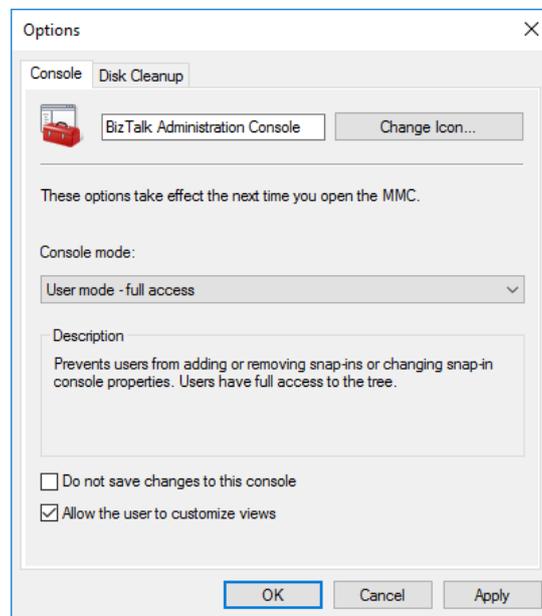
To be easier and more convenience for BizTalk Administrators the BHM Snap-In can also be integrated so that it can be used with BizTalk Administration Console.

To accomplish that we need to open a 32-bit Microsoft Management Console (MMC):

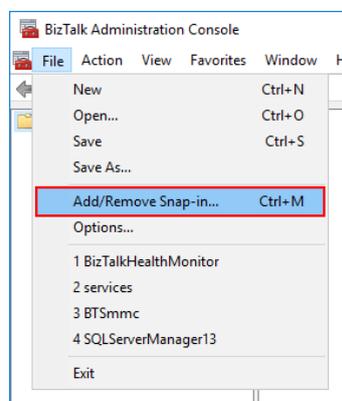
- Press the “Windows key” to open the Start menu, type “mmc /32” and right-click in “mmc /32” option from the Search window and select “Run as administrator” option:
 - mmc /32
 - This will open a new 32-bit version of MMC (MMC32).
- From MMC console, go to File menu and select “Options...” option



- In the text box, replace “Console1” for “BizTalk Administration Console”
- In the Console mode combo box, select “User mode – full access”
- And confirm that the option “Do not save changes to this console” is unchecked

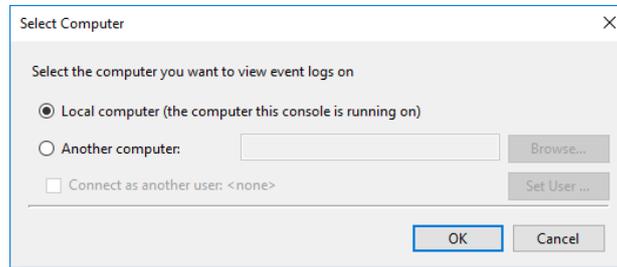


- From MMC console, go to File menu and select “Add/Remove Snap-in...” option

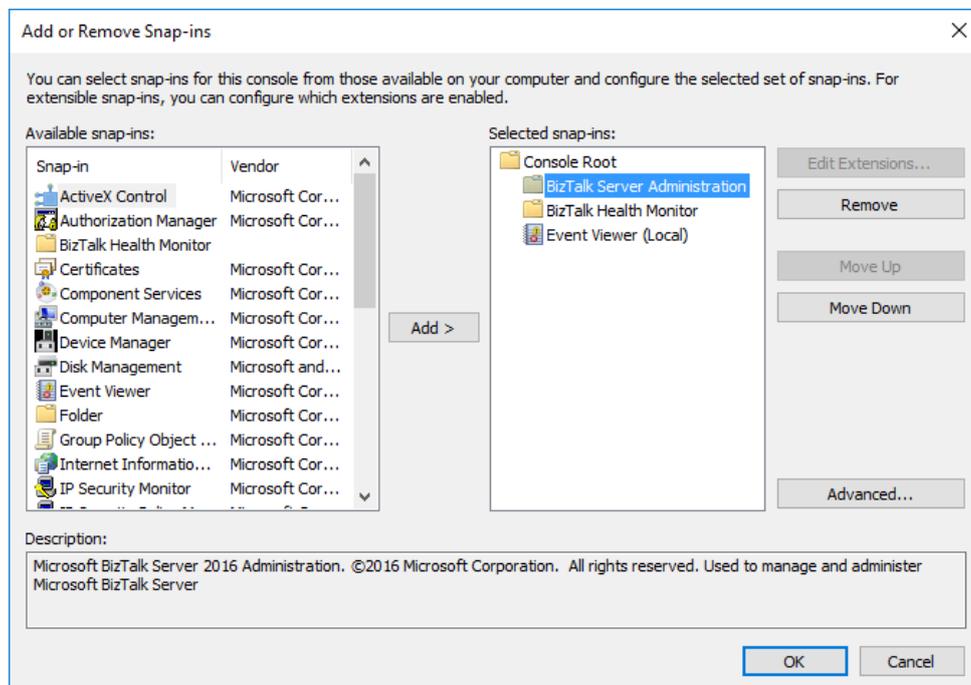


- From the “Add or Remove Snap-ins” window, add following snap-ins and then click Ok

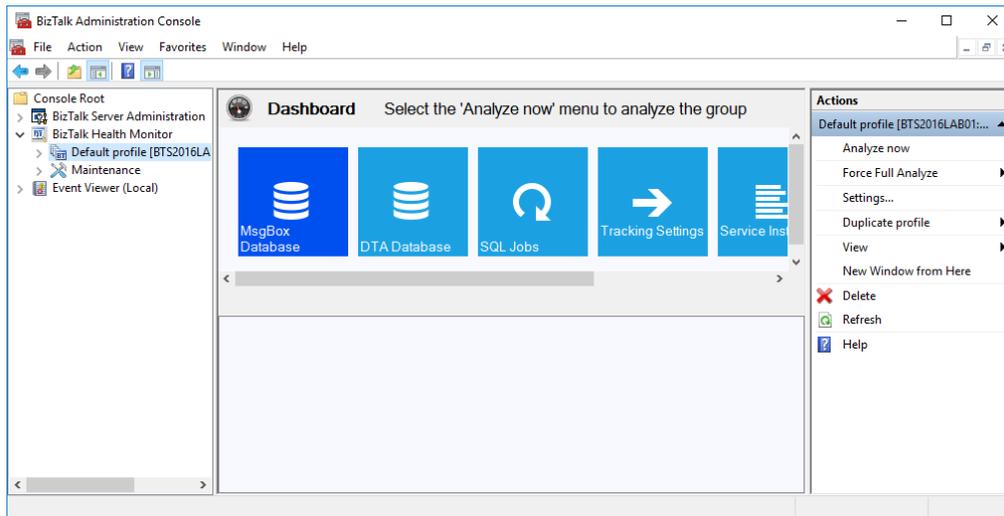
- Microsoft BizTalk Server Administration
- BizTalk Health Monitor
- Event Viewer
 - It will open a new window and you should select “Local Computer” option



- You can add the snap-ins by selecting them from the “Available snap-ins” list and click “Add >”
- It is recommended that you respect the order present in the “Selected snap-ins” list as showed in the picture above



- This will generate for us a new MMC which contains both the BizTalk Server Administration and BizTalk Health Monitor. And by now your new MMC is ready which shows both the BizTalk Server Administration and BizTalk Health Monitor



Now you might want to save this as a new .msc file so that you don't have to repeat these steps again, but before we complete the creation process of the "new" BizTalk Administration Console, I recommend that you navigate to the BizTalk Server Installation folder:

- Example: C:\Program Files (x86)\Microsoft BizTalk Server 2016
- And rename "BTSmmc.msc" file, for example: "BTSmmc-old.msc"

This because we will save the "new" BizTalk Administration Console as "BTSmmc.msc" so that you don't need to create new shortcuts or having different ways to access the BizTalk Administration Console – however this step is optional!

To finished the creation process of the "new" BizTalk Administration Console

- From MMC console, go to File menu and select "Save As..." option:
 - Give a name and then save it.
 - Access to BizTalk Server Installation folder
 - C:\Program Files (x86)\Microsoft BizTalk Server 2016
 - Save the file as "BTSmmc.msc"

From next time onwards, when you open the BizTalk Server Administration Console, the "new" BizTalk Administration Console will be incorporated with the BizTalk Health Monitor.

You can download the standalone version of BHM from Microsoft Download Center here:
[BizTalk Health Monitor](#)

Install SSO Configuration Application MMC Snap-In (Optional)

BizTalk Server leverages the Enterprise Single Sign-On (SSO) capabilities for securely storing critical information such as secure configuration properties (for example, the proxy user ID, and proxy password) for the BizTalk adapters. Therefore, BizTalk Server requires SSO to work properly. BizTalk Server automatically installs SSO on every computer where you install the BizTalk Server runtime.

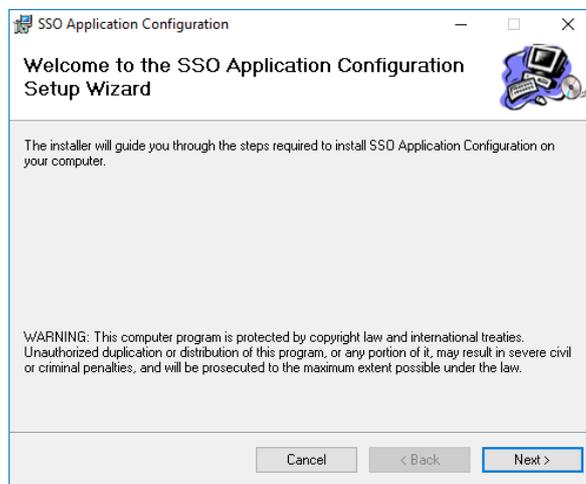
But it also can keep your own application configuration data in SSO database, let say the usual configurations that we normally keep in a configuration file ("app.config"). One of the great and

useful tools that we normally use for archiving this is a custom tool original created by Richard Seroter, the: SSO Config Data Store Tool.

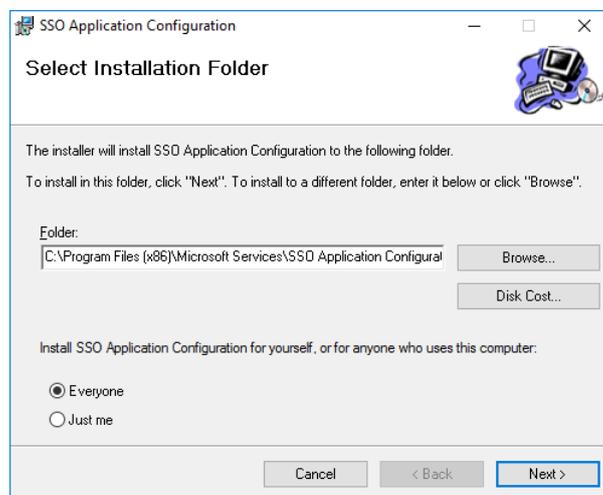
However, since 2009 that Microsoft released a MMC snap-in to tackle this exact issue: SSO Configuration Application MMC Snap-In provides the ability to add and manage applications, add and manage key value pairs in the SSO database, as well as import and export configuration applications so that they can be deployed to different environment.

To install SSO Configuration Application MMC Snap-In you need to:

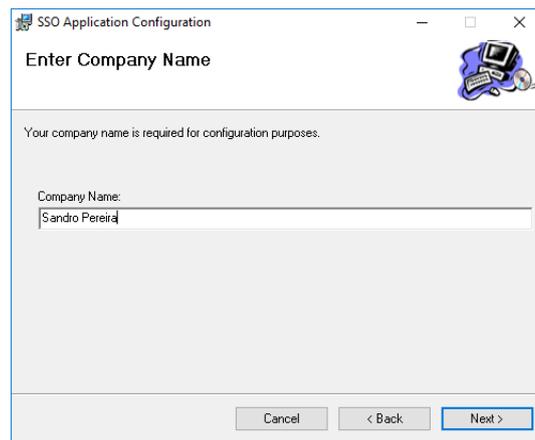
- Unzip the SSOConfigurationMMCSnapIn.zip file available in Microsoft page.
- This file is composed by three zip files, so after unzip the first file you should unzip also the SSOMMCSnapInSetup.zip file.
- Run as Administrator the setup.exe or SSOMMCSnapInSetup.msi file
- In the Welcome to the SSO Application Configuration Setup Wizard page, click “Next”



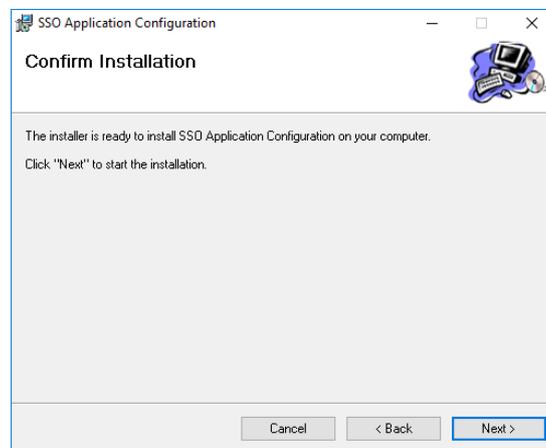
- In the Select Installation Folder page:
 - Accept the default installation folder or set another one
 - In the “Install SSO Application for yourself, or for anyone who uses this computer” option, select “Everyone”
 - And click “Next”



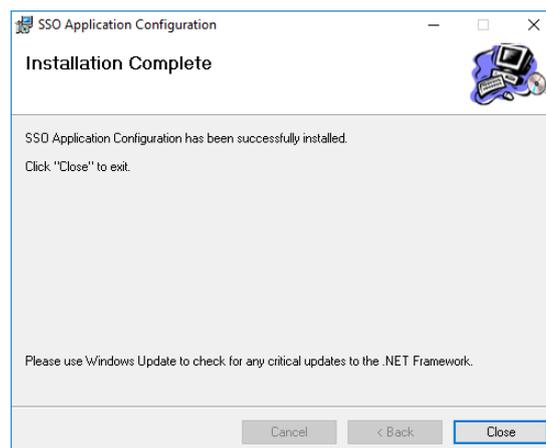
- In the Enter Company Name page, enter the name of your company and click “Next”



- In the Confirm Installation page, click “Next” to install the SSO Application Configuration MMC Snap-In



- In the Installation Complete page, click “Close”

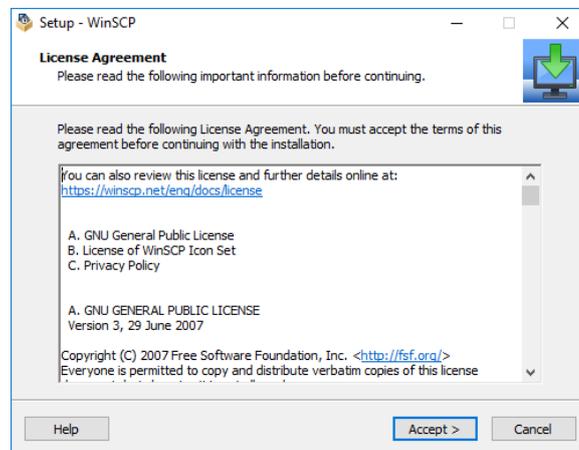


Installing WinSCP (Optional)

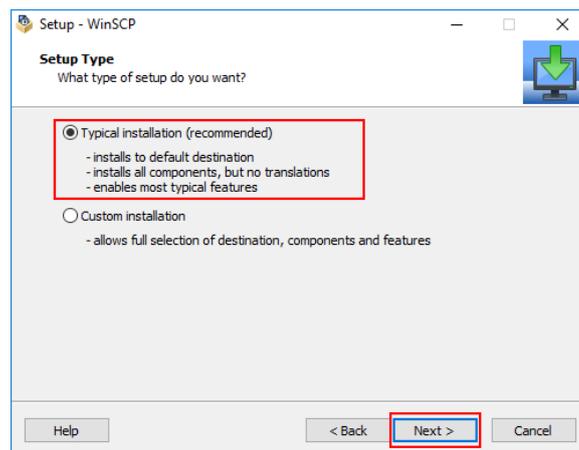
The “new” SFTP adapter was re-engineered in BizTalk Server 2016 to use WinSCP to connect to SFTP; which allows support for more SFTP servers. Client-side logging and additional encryption ciphers are also new. So if you want to use the SFT adapter WinSCP is a prerequisite.

To Install WinSCP:

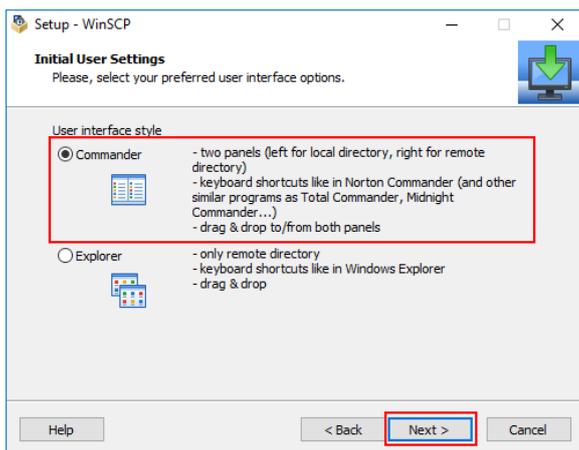
- You need to download from WinSCP website: <http://winscp.net/>, version 5.7.5 or later;
- Execute “WinSCP-5.9.2-Setup” as an administrator
- On the License page, accept the license agreement by click “Accept >”.



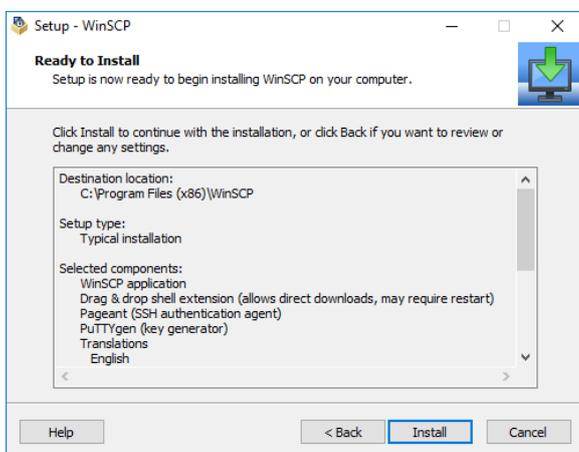
- On the Setup Type page, select the option “Typical installation (recommended)” and then click “Next >”.



- The Initial User Settings page, allows you to select user interface style. Select the option “Commander” and then click “Next >”.
 - If you have used (and enjoyed) file managers like Total Commander, Altap Salamander or Norton Commander before, keep default Commander interface. Otherwise you will probably be more familiar with Explorer interface.



- On the Ready to Install page, you can review the installation options you've selected. Click "Install" to start the installation.



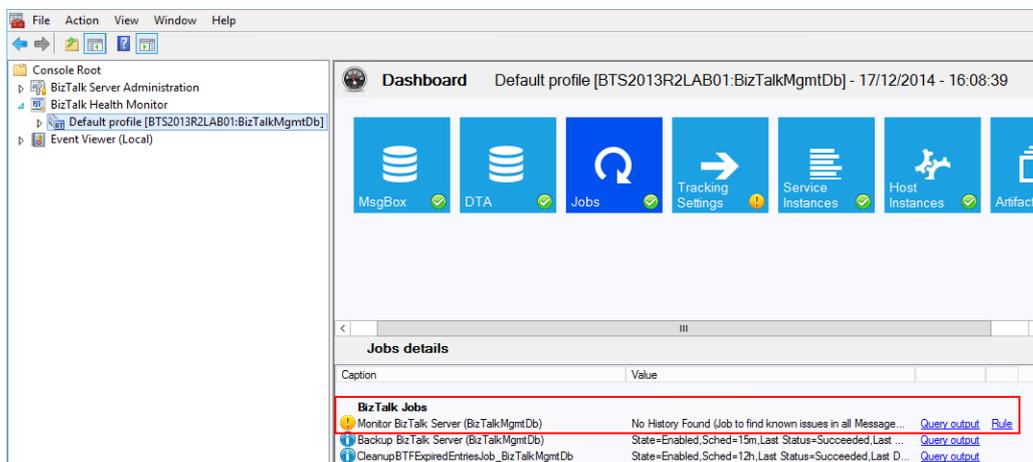
- On the Completing the WinSCP Setup Wizard page, click "Finish"



NOTE: You may have to restart Windows Explorer or your computer. If you choose not to restart, some WinSCP functions may not be available until you do so.

Configure BizTalk Jobs History (Microsoft SQL Server Agent job history log)

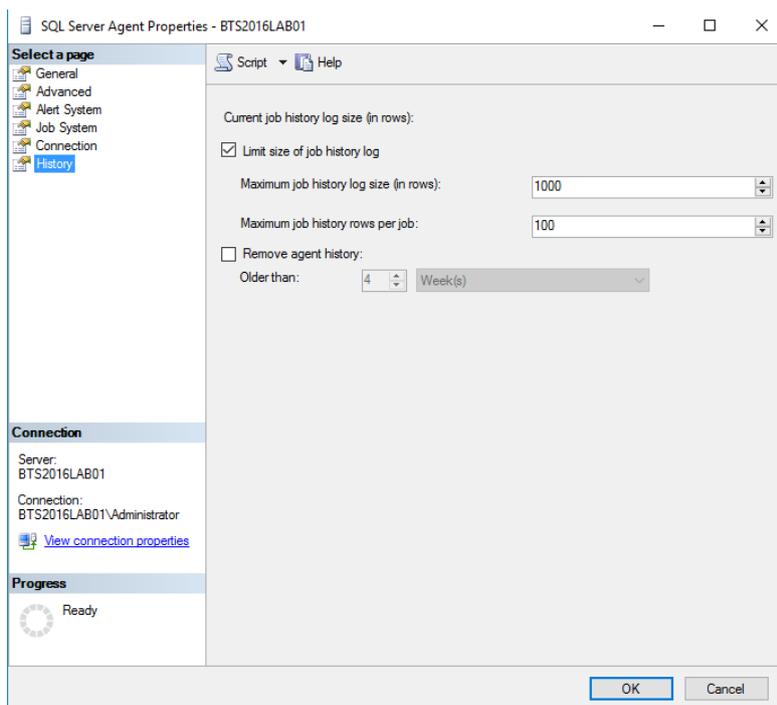
Have you ever noticed that you never have present a log history of the Monitor BizTalk Server job?



The reason why this happens is that BizTalk Server is shipped out with a total of 13 SQL Agent jobs, most of them running each minute, the only exception is the Monitor BizTalk Server job that by default occurs every week on Sunday at 00:00:00.

And to be completely honest there are two problems present:

- We rarely inspect our environment in the weekend, only in critical situations or customers that have a 24x7 administration team.
- By default, the Microsoft SQL Server Agent job history log is configured to
 - “Limit size of job history log” with a maximum of 1000 rows
 - And “Maximum job history row per job” with 100 rows

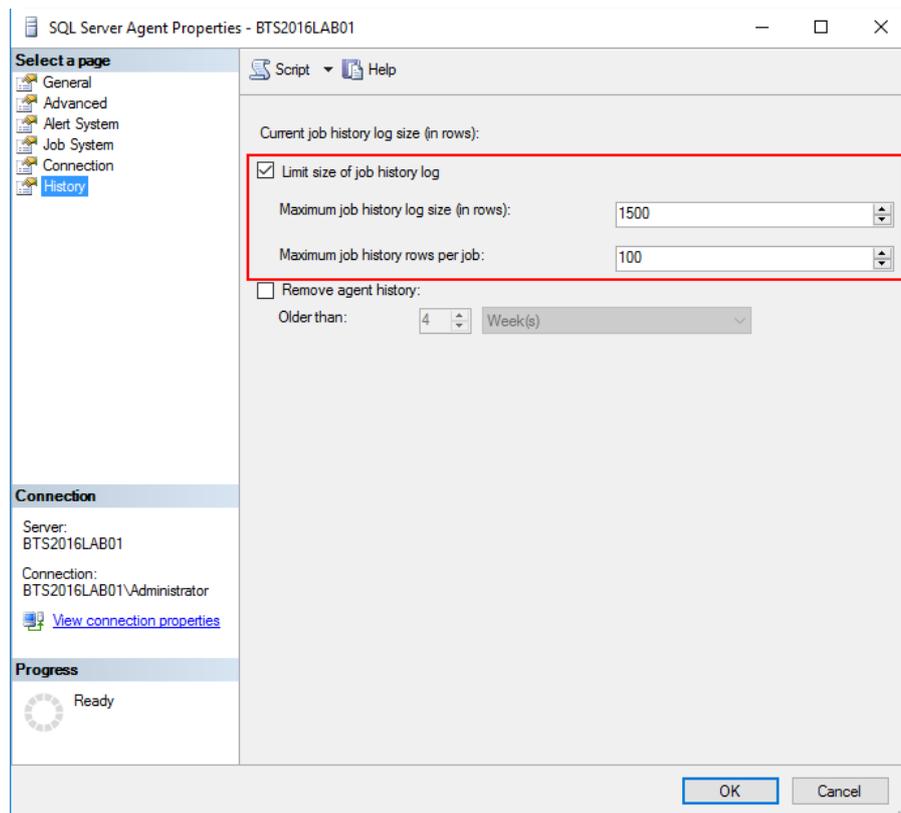


Which means that a few minutes after the Monitor BizTalk Server job run successfully or unsuccessfully, it's historic is overwritten with the row log historical of the remaining 12 jobs. Therefore, never expect to have this historic job on Monday when you arrive to the office.

Because BizTalk Server has 13 Jobs to keep a decent and consistent job history log you should increase the "Limit size of job history log" according to the number of existing jobs in your environment, for example at least 1300 for BizTalk Server environment (100 for each job)

To resize the job history log based on raw size

- In Object Explorer, connect to an instance of the SQL Server Database Engine, and then expand that instance.
- Right-click SQL Server Agent, and then click Properties.
- Select the History page, and then confirm that Limit size of job history log is checked.
- In the Maximum job history log size box, enter the maximum number of rows the job history log should allow.
- In the Maximum job history rows per job box, enter the maximum number of job history rows to allow for a job.



To resize the job history log based on time

- In Object Explorer, connect to an instance of the SQL Server Database Engine, and then expand that instance.
- Right-click SQL Server Agent, and then click Properties.
- Select the History page, and then click automatically remove agent history.
 - Select the appropriate number of Days(s), Week(s), or Month(s).

Managing and cleaning BizTalk Server MarkLog database tables

All the BizTalk databases are being backed up by the 'Backup BizTalk Server' job, so all databases with the exception of the BAM Star Schema database (BAMStarSchema), have a table called "MarkLog".

These tables are holding all the transaction marks (they are actually timestamps in a string format), set to a specific database, created by the 3th step (MarkAndBackUpLog) of the 'Backup BizTalk Server' job. This step, MarkAndBackupLog, is responsible for marking the logs for backup, and then backing them up. So each time this step runs, by default each 15 minutes, a string is stored on that table with the following naming convention:

- Log_<yyyy>_<MM>_<dd>_<HH>_<mm>_<ss>_<fff>

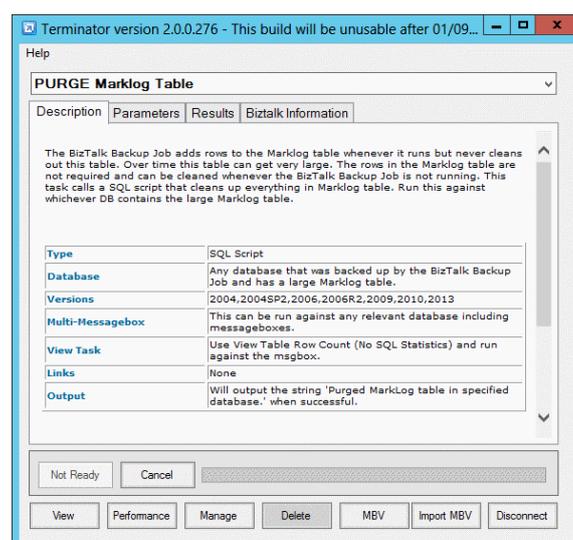
Where:

- **"Log"**: Constant string
- **yyyy**: The year as a four-digit number.
- **MM**: The month, from 01 through 12
- **dd**: The day of the month, from 01 through 31.
- **HH**: The hour, using a 24-hour clock from 00 to 23.
- **mm**: The minute, from 00 through 59.
- **ss**: The second, from 00 through 59.
- **fff**: The milliseconds in a date and time value.

Again this marks are timestamps in which the Log backups were set to be made. Example:

- **BTS_2014_05_06_14_15_01_327**

Unfortunately, BizTalk has no out-of-the-box possibilities to clean up these tables. And the normal procedure is to run the terminator tool to clean it up. See also: [Clean up the MarkLog table with Terminator](#).



BizTalk Terminator is an excellent tool that allows for common BizTalk problems to be addressed by scripts provided by the BizTalk Team, but needs to be used carefully and by users who know what they are doing.

Although most of the times this is extremely useful tool and our friend, in this particular operation/situation using this tool it's not really the best option for two reasons:

- Using this tool means that we need to stop our environment, i.e., downtime in our integration platform.
- And if we look at the description of this "PURGE Marklog table" task it says that this operation **calls a SQL script that cleans up everything in Marklog table** – and maybe this is not a best practice!

You also need to analyze some important questions in order to find and define some of the best practice to maintain these tables:

Is these information (timestamps) useful for BizTalk Administrators? Should I clean all the data inside this tables or should I maintain a history?

For the same reason that we maintain a Backup history in the Adm_BackupHistory table controlled by the step "Clear Backup History" of the 'Backup BizTalk Server' job. This information is important for example to keep an eye on the backup/log shipping history records to see whether the back is working correctly and data/logs are restored correctly in the stand by environment. The information on the MarkLog tables are also useful for the BizTalk Administration team!

So as long as the MarkLog tables have the same info (data from the same dates) as the backup job days to keep you can safely delete the rest of the information.

As a best practice: you should respect the @DaysToKeep parameter that you specify in the "Clear Backup History" step of the 'Backup BizTalk Server' job.

And this is why that in my opinion, **you shouldn't use the Terminator tool** to perform this operation!

Is it safe to clean this information in runtime?

The rows in the MarkLog table are not "required" and can be cleaned whenever you want as long the BizTalk Backup Job is not running.

Cleaning MarkLog Tables According to Some of the Best Practices

So the main challenger is how can we safely delete and maintain a history of all MarkLog tables according to some of the best practices described earlier?

My first approach was creating a new job that according to a scheduler would run a stored procedure to delete all the unnecessary information on that tables but I realized I could have two problems with this approach:

- I need to be sure that BizTalk Backup Job wasn't running performing the backups;
- I don't want to have two places to define the @DaysToKeep and I don't want to make unnecessary joins or additional selects

So I ended up recreating `sp_DeleteBackupHistory` (that is configured is the Backup BizTalk Server (BizTalkMgmtDb) job in the last step) with a different name `sp_DeleteBackupHistoryAndMarkLogsHistory` and configure the job to run this step:

```

USE [BizTalkMgmtDb]
GO
/***** Object:  StoredProcedure [dbo].[sp_DeleteBackupHistoryAndMarkLogsHistory]
Script Date: 22/05/2014 17:59:15 *****/
SET ANSI_NULLS ON
GO
SET QUOTED_IDENTIFIER ON
GO
CREATE PROCEDURE [dbo].[sp_DeleteBackupHistoryAndMarkLogsHistory] @DaysToKeep smallint
= null, @UseLocalTime bit = 0
AS
BEGIN
    set nocount on
    IF @DaysToKeep IS NULL OR @DaysToKeep <= 0
        RETURN
    /*
        Only delete full sets
        If a set spans a day such that some items fall into the deleted group
and the other don't don't delete the set

        Delete history only if history of full Backup exists at a later point of
time
        why: history of full backup is used in sp_BackupAllFull_Schedule to
check if full backup of databases is required or not.
        If history of full backup is not present, job will take a full backup
irrespective of other options (frequency, Backup hour)
    */

    declare @PurgeDateTime datetime
    if (@UseLocalTime = 0)
        set @PurgeDateTime = DATEADD(dd, -@DaysToKeep, GETUTCDATE())
    else
        set @PurgeDateTime = DATEADD(dd, -@DaysToKeep, GETDATE())

    DELETE [dbo].[adm_BackupHistory]
    FROM [dbo].[adm_BackupHistory] [h1]
    WHERE [BackupDateTime] < @PurgeDateTime
    AND [BackupSetId] NOT IN ( SELECT [BackupSetId] FROM
[dbo].[adm_BackupHistory] [h2] WHERE [h2].[BackupSetId] = [h1].[BackupSetId] AND
[h2].[BackupDateTime] >= @PurgeDateTime)
    AND EXISTS( SELECT TOP 1 1 FROM [dbo].[adm_BackupHistory] [h2] WHERE
[h2].[BackupSetId] > [h1].[BackupSetId] AND [h2].[BackupType] = 'db')

    /*****
    *****
        Delete all the non referenced MarkLog rows in the BizTalk group.
        These rows are not removed by default.

        The logic for cursors and realservername is "stolen" from the BizTalk
procedure sp_MarkBTSLogs.
        The cursor iterates all the databases that are backed up by BizTalk.

    *****
    *****/
    declare
@localized_string_sp_DeleteBackupHistoryAndMarkLogsHistory_Failed_sp_GetRemoteServerNa

```

```

meFailed nvarchar(128)
    set
@localized_string_sp_DeleteBackupHistoryAndMarkLogsHistory_Failed_sp_GetRemoteServerNameFailed = N'sp_GetRemoteServerName failed to resolve server name %s'
    declare
@localized_string_sp_DeleteBackupHistoryAndMarkLogsHistory_Failed_Deleting_Mark
nvarchar(128)
    set
@localized_string_sp_DeleteBackupHistoryAndMarkLogsHistory_Failed_Deleting_Mark =
N'Failed running the deleting mark log proc on %s'

    DECLARE @BackupServer sysname, @BackupDB sysname, @RealServerName sysname,
@errorDesc nvarchar(128)
    DECLARE @tsql nvarchar(1024)
    DECLARE @ret int, @error int

    /* Create a cursor */
    DECLARE BackupDB_Cursor insensitive cursor for
        SELECT ServerName, DatabaseName
        FROM admv_BackupDatabases
        ORDER BY ServerName

    open BackupDB_Cursor
    fetch next from BackupDB_Cursor into @BackupServer, @BackupDB
    WHILE (@@FETCH_STATUS = 0)
        BEGIN
            -- Get the proper server name
            EXEC @ret = sp_GetRemoteServerName @ServerName = @BackupServer,
@DatabaseName = @BackupDB, @RemoteServerName = @RealServerName OUTPUT

            IF @@ERROR <> 0 OR @ret IS NULL OR @ret <> 0 OR @RealServerName
IS NULL OR len(@RealServerName) <= 0
                BEGIN
                    SET @errorDesc = replace(
@localized_string_sp_DeleteBackupHistoryAndMarkLogsHistory_Failed_sp_GetRemoteServerNameFailed, N'%s', @BackupServer )
                    RAISERROR( @errorDesc, 16, -1 )
                    GOTO FAILED
                END

            /* Create the delete statement */
            select @tsql =
                'DELETE FROM [' + @RealServerName + '].[' + @BackupDB +
                '].[dbo].[MarkLog]
                WHERE DATEDIFF(day,
REPLACE(SUBSTRING([MarkName],5,10),'_', '''), GETDATE()) > ' + cast(@DaysToKeep as
nvarchar(5) )

            /* Execute the delete statement */
            EXEC (@tsql)
            SELECT @error = @@ERROR
            IF @error <> 0 or @ret IS NULL or @ret <> 0
                BEGIN
                    SELECT @errorDesc = replace(
@localized_string_sp_DeleteBackupHistoryAndMarkLogsHistory_Failed_Deleting_Mark, '%s',
@BackupServer + N'.' + @BackupDB )
                    GOTO FAILED
                END

            /* Get the next DB. */
            fetch next from BackupDB_Cursor into @BackupServer, @BackupDB
        END
    END

```

```

close BackupDB_Cursor
deallocate BackupDB_Cursor
GOTO DONE
FAILED:
SET @ret = -1
RAISERROR( @errorDesc, 16, -1 )

GOTO DONE
DONE:
RETURN @ret
END

```

Special thanks for [Mikael Sand](#), [Tord Glad Nordahl](#), [Rui Romano](#) and [Pedro Sousa](#) for the feedback and for being co-authors for the implementation logic of this job.

The script can be found and download on Microsoft TechNet Gallery: [BizTalk Server: Cleaning MarkLog Tables According to Some of the Best Practices](#)

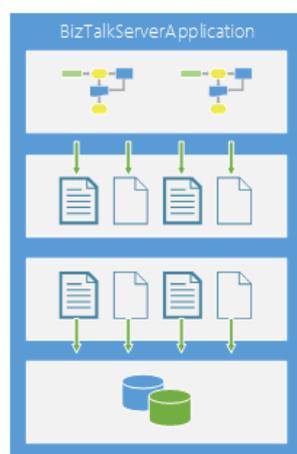
Configure Host and Host instances

One of the tasks that we need to do in all our new BizTalk environments over and over again is creating and configuring the Host, Host Instances and of course the adapter handlers.

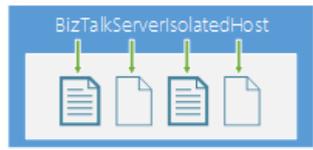
BizTalk Server provides great flexibility for addressing high availability, because you can strategically dedicate logical hosts to run specific areas of functionality such as receiving messages, sending messages or processing orchestrations.

By default the BizTalk configuration will create two BizTalk Host and Host Instances:

- **BizTalkServerApplication:** This is the default Host and Host Instance created during configuration that will do all the work on the BizTalk Server, i.e. is the default send and receive handler for all installed adapters (other than HTTP, WCF (BasicHttp, CustomIsolated, WebHttp and WSHttp) and SOAP Receive Handlers), and is also used for processing orchestration and tracking.



- **BizTalkServerIsolatedHost:** The logical container for HTTP, WCF (BasicHttp, CustomIsolated, WebHttp and WSHttp) and SOAP Receive Handlers.



Although a single BizTalk Host can contain items that receive, send, and process messages, it is considered a best practice to create different hosts for each function to create security boundaries and for easier management and scalability. In particular, we recommend that you use different hosts for processing and for receive/send operations, and that you separate trusted and non-trusted items.

What are Host, Host Instances and Adapter Handlers?

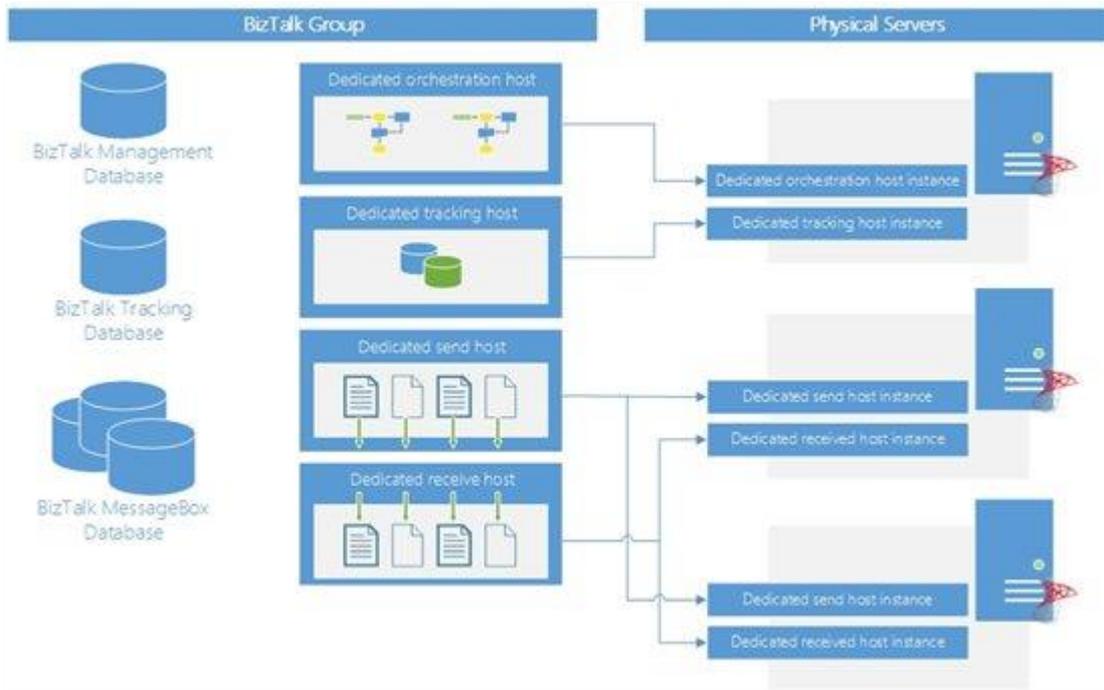
A BizTalk Host is a logical process and security boundary within BizTalk Server that represents a logical set of zero or more run-time processes in which you can deploy BizTalk Server services and artifacts (such as adapter handlers, receive locations, and orchestrations). Each host has a security group assigned to it and may contain multiple host instances, each on an individual machine, that perform the work of the host. The Host object also represents a collection of runtime instances (zero or more) where the deployed items physically run. Hosts have the following characteristics:

- You can map one host to multiple servers.
- Only one instance of a specific host can exist on each server.

In turn, a host instance is the physical instance of a host on a computer running BizTalk Server. Each host instance belongs to exactly one host, and the service account of the host instance belongs to the security group of the host. The security group may be used to grant permissions to physical resources such as databases for use by any host instances in the host. Host instances have the following characteristics:

- Host instances running on the servers are the physical containers of BizTalk objects.
- You create a host instance when you map a server to a host.
- Multiple host instances (of different hosts) can exist on a server.
- **NOTE:** After you create a host (a logical container), you can add physical BizTalk servers (host instances) to the host. You cannot add a BizTalk server to the same host more than once. A single host instance can be added to multiple hosts. More about hosts here.

The following figure will provide you with a general overview of the relationship between servers, hosts and host instances, however it is not intended to be the best practice. This architecture will depend from many factors and will change from client to client:



An adapter handler is an instance of a BizTalk host in which the adapter code runs. When you specify a send or receive handler for an adapter you are specifying which host instance the adapter code will run in the context of. An adapter handler is responsible for executing the adapter and contains properties for a specific instance of an adapter. A default BizTalk Server configuration will create adapter handlers for all of the installed adapters, but you may want to create additional adapter handlers for purposes of load balancing or to provide process isolation for a particular adapter handler.

Best practices to Configuring Hosts and Host Instances

As the [official documentation](#) specify, in addition to the high availability aspects of the host instance configuration, you should separate sending, receiving, processing, and tracking functionality into multiple hosts. This provides flexibility when configuring the workload in your BizTalk group and is the primary means of distributing processing across a BizTalk group.

This also allows you to stop one host without affecting other hosts. For example, you may want to stop sending messages to let them queue up in the MessageBox database, while still allowing the inbound receiving of messages to occur.

Separating host instances by functionality also provides some of the following benefits:

- Each host instance has its own set of resources such as memory, handles, and threads in the .NET thread pool.
- Multiple BizTalk Hosts will also reduce contention on the MessageBox database host queue tables since each host is assigned its own work queue tables in the MessageBox database.
- Throttling is implemented in BizTalk Server at the host level. This allows you to set different throttling characteristics for each host.

- Security is implemented at the host level; each host runs under a discrete Windows identity.

However, this also may bring some potential drawbacks if too many host instances are created because each host instance is a Windows service (BTSNTSvc.exe or BTSNTSvc64.exe), which generates additional load against the MessageBox database and consumes computer resources (such as CPU, memory, threads), so you need to be careful.

Normally we read that we need to create at least 4 host instances: sending, receiving, processing, and tracking, but that's not absolutely true because, at least since BizTalk Server is supported in 64 bits, we typically use 64-bits versions and in this case we also need to create at least one Host Instance that will run on 32-bits because FTP adapter, SQL adapter, POP3 adapter and MIME Decoder on 64-bit host instances is not supported by the product (<http://technet.microsoft.com/en-us/library/aa560166.aspx>)

We can define that one of the best practices for hosts and host instances is the following:

- **BizTalkServerTrackingHost:** A BizTalk Host that hosts tracking is responsible for moving the DTA and BAM tracking data from the MessageBox database to the BizTalk Tracking (DTA) and BAM Primary Import databases. This movement of tracking data has an impact on the performance of other BizTalk artifacts that are running in the same host that is hosting tracking. Thus, you should use a dedicated host that does nothing but host tracking.
 - Only the option "Allow Host Tracking" must be selected because we only will use this host for tracking.
- **BizTalkServerReceiveHost:** All options ("Allow Host Tracking", "32-bits only" or "Make this default host in the group") should be unselected. This host will be responsible for processing messages after they are picked up in a receive location. When a host contains a receiving item, such as a receive location (with a pipeline), the message decoding and decrypting occurs in a pipeline within this host.
 - All receive handlers, except the isolated ones like SOAP, HTTP, WCF-BasicHttp, WCF-WsHttp or WCF-CustomIsolated and 32 bit adapters (FTP, SQL and POP3) will be configured for this host. This will mean also that all receive locations will run in this host instance.
- **BizTalkServerReceive32Host:** has the same goal as the previous however this must have the "32-bits only" option select so that we can run the 23-bits adapters.
 - The receive handlers for the FTP, SQL and POP3 adapters will be configured for this host.
- **BizTalkServerSendHost:** All options ("Allow Host Tracking", "32-bits only" or "Make this default host in the group") should be unselected. This host will be responsible for processing messages before they are sent out to the send port. When a host contains a sending item, such as a send port, the message signing and encryption occurs in a pipeline within this host.
 - All send handlers, except 32 bit adapters like native SQL and FTP adapter, will be configured for this host. This will mean also that all send ports will run in this host instance.

- **BizTalkServerSend32Host:** has the same goal as the previous however this must have the “32-bits only” option select so that we can run the 32-bits adapters.
 - The Send handlers for the FTP and SQL adapters will be configured for this host.
- **BizTalkServerApplication:** Only the option “32-bits only” should be select in this host. This host will be responsible for process messages based on the instructions in orchestrations that need to run in 32-bits.
- **BizTalkServerApplication64Host:** Only the option “Make this default host in the group” should be select in this host. This host will be responsible for process messages based on the instructions in all or most common orchestrations.

NOTE: You can create other Application Hosts if you want to separate process based on some application logic.

How can I automate this task?

Windows PowerShell is a Windows command-line shell designed especially for system administrators and can be used by BizTalk administrators to help them in automating tasks.

You can find a simple script to configure **Host, Host Instance and Adapter Handlers** described earlier in this post optimized for BizTalk Server 2016 (and also 2013) in TechNet Gallery: [PowerShell to Configure BizTalk Server 2013/2013 R2 Host and Host Instances](#)

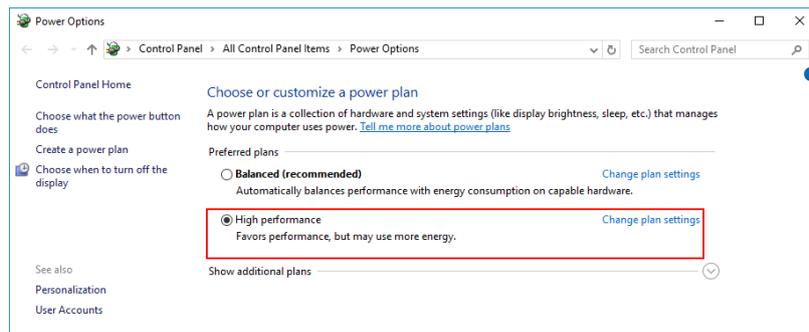
Power Mode

The different performance states are dynamically managed by Windows in conjunction with hardware and platform firmware to respond to varying workload requirements. The 3 default power plans exposed by Windows provide varying tradeoffs of performance vs. power consumption. For example, if the High Performance power plan is selected, Windows places the system in the highest performance state and disables the dynamic scaling of performance in response to varying workload levels. Therefore, special care should be taken before setting the power plan to High Performance as this can increase power consumption unnecessarily when the system is underutilized.

In some cases, you may experience degraded overall performance on a machine when running with the default (Balanced) power plan. The issue may occur irrespective of platform and may be exhibited on both native and virtual environments. The degraded performance may increase the average response time for some tasks and cause performance issues with CPU-intensive applications

To change a power plan:

- Press the “Windows key” to open the Start menu and type “Power Options” and click in “Power Options” option from the Search window.
- From the power plan page, choose the High Performance option



- Close the Power Option window.

Consider setting the 'text in row' table option to boost BizTalk Server Performance (optional)

SQL Server provides a table option called **text in row** to declare that the contents of the fields of type **text**, **ntext**, or **image** data whose dimensions are smaller than those of a data page (8Kb) must be stored in a data row. By setting this option on BizTalkMsgBoxDb tables (Parts table, Spool table and DynamicStateInfo Tables), you can increase message throughput when working with small messages which have a small context and orchestrations that have a small persistence size. This makes reading and writing the in-row strings about as fast as reading or writing limited size varchar, nvarchar, or varbinary strings. Similarly, when the values are stored off-row, the Database Engine incurs an additional page read or write.

How to exploit the Text in Row table option in BizTalk Server

The following section explains how and when applying the text in row table option to boost BizTalk performance.

- **Parts Table:** When the message size is smaller than the dimensions of a data page that are of 8kb, applying the text in row table option on the Parts table can lead to BizTalk Server performance improvement.
- **Spool Table:** When the average size of the message context is less than 8 kb, enabling the text in row table option on the Spool table helps you reduce the number of accesses when reading messages from the MessageBox along with their context. To apply this option to the Spool table, you must eliminate unnecessary context properties and distinguished fields to reduce the size of the message context lower than 8 Kb.
- **DynamicStateInfo Tables:** These tables, one for each host, contain a field of type image called imgData that contains binary-serialized orchestration state when they encounter a persistence point during their execution. When the internal state of orchestrations within a host HostA is so small that its size once serialized is less than 8 kb, the text in row technique can successfully be applied to the DynamicStateInfo_HostA table. Therefore, we recommend that you keep the internal state of orchestrations as small as possible. This technique can significantly reduce the time that is spent by the XLANG Engine to serialize, persist, de-serialize and restore the internal state of an orchestration in case of persistence point.

See more about this topic in the following resources:

- [Post-Configuration Database Optimizations](#)
- [How to exploit the Text In Row table option to boost BizTalk Server Performance](#)
- [Microsoft BizTalk Server 2013 Performance Optimization Guide](#)

You can use the following settings sample that in your environment:

```
EXEC sp_tableoption N'Spool', 'text in row', '6000'  
EXEC sp_tableoption N'Parts', 'text in row', '6000'
```

6 Appendix A: Hardware and Software Requirements

Hardware Requirements

The following table shows the minimum hardware requirements for your BizTalk Server computer. In a production environment, the volume of traffic may dictate greater hardware requirements for your servers.

Resource Id	Minimum Requirement
Computer and processor	<p>A computer with an Intel Pentium-compatible CPU that is:</p> <ul style="list-style-type: none"> • 1 GHz or higher for single processors • 900 MHz or higher for double processors • 700 MHz or higher for quad processors <p>Notes:</p> <ul style="list-style-type: none"> • Hyper-Threading and Dual-Core processors are supported. • The 64-bit versions of BizTalk Server require a 64-bit operating system running on an x64-based system. Computers based on CPUs that are compatible with the AMD64 (x86-64) and Extended Memory 64-bit Technology (EM64T) processor architecture are considered x64-based systems. • BizTalk Server is not supported on Itanium-based systems.
Memory	2GB or more
Hard disk	45 GB of available hard disk space for a complete installation including the operating system and all prerequisite software. The hard disk must be NTFS formatted.

Source: https://msdn.microsoft.com/en-us/library/jj248697.aspx#BKMK_HardRequirements

Software Requirements

This table lists the software required for running BizTalk Server. You'll be guided through installation steps for all of these prerequisites in a later section.

Software Required	Description	Required for
Microsoft Windows	<ul style="list-style-type: none"> • Windows Server 2016 • Windows Server 2012 R2 • Windows 10 • Windows 8.1 	
Internet Information Services (IIS)	The version that comes with the operating system	Provides a scalable Web application infrastructure and is required for EDI, BAM, WSS Adapter, and UDDI.

Windows Identity Foundation	OPTIONAL When using the Windows SharePoint Services Client Side Object Model (CSOM), Windows Identity Foundation is needed.	SharePoint Services adapter or SharePoint Services Online when used with SharePoint Services Client Side Object Model (CSOM). It is not needed when using the SharePoint Services Web Service, which is deprecated. Or when you don't want to use this feature.
Microsoft Office	OPTIONAL Microsoft Office Excel 2016 or 2013. BIZTALK SERVER 2016 SUPPORTS ONLY 32-BIT VERSION OF MICROSOFT OFFICE.	Required by Business Activity Monitoring (BAM) to display a real-time view of business processes
Microsoft .NET Framework	.NET Framework 4.6	This is required for all BizTalk Server managed components
Microsoft Visual Studio	OPTIONAL Visual Studio 2015	Provides a development environment for building BizTalk Server applications. Ultimate Edition is recommended, but Premium and Professional are also supported. This is required for BizTalk Server Developer Tools and SDK component
Microsoft Visual C++ 2013 Redistributable Package	On an x86 computer, install only the x86 version of the package. On an x64 computer, install both x86 and x64 versions of the package. The installer is available as part of the BizTalk Server installation media under \Platform\SSO\Platform.	The Microsoft Visual C++ Redistributable Package installs runtime components of Visual C++ Libraries required to run applications developed with Visual C++ on a computer that does not have Visual C++ installed. Note: The 2013 version is required, even though Visual Studio 2015 is used

Microsoft SQL Server	<ul style="list-style-type: none"> • Microsoft SQL Server 2016 • Microsoft SQL Server 2014 SP1 <p>For optimal performance, Microsoft recommends the Enterprise Edition of SQL Server. In order to fully use the BizTalk Server 2016 SDK, or deploy BizTalk Server applications from a Visual Studio development environment, you must also install the SQL Server Development Tools.</p> <p>Other considerations</p> <ul style="list-style-type: none"> • BAM real-time aggregation (RTA) is not supported in the Standard Edition of SQL Server. • Using SQL Server Express Edition is not recommended. The Express edition does not include certain features needed by BizTalk Server. • BizTalk Server supports all case-sensitive and case-insensitive SQL Server collations except for binary collations. Binary collations are not supported. 	This is required for BizTalk Server Runtime, EDI, and BAM
SQL Server Database Mail	<p>OPTIONAL</p> <ul style="list-style-type: none"> • You must configure SQL Server Database Mail to use BAM Alerts. 	Enables the use of BAM Alerts
SQLXML 4.0 with Service Pack 1	<p>SQLXML enables XML support for your SQL Server Database. It allows developers to bridge the gap between XML and relational data. You can create XML View of your existing relational data and work with it as if it was an XML file.</p> <p>NOTE: You don't need to worry about installing this because REDISTRIBUTABLE CAB FILE will install this for you if necessary.</p>	This is required for BizTalk Server Runtime, Administrative Tools, and BAM.
WinSCP	<p>WinSCP version 5.7.5 and newer.</p> <p>Download WinSCP.</p>	Required to use the SFTP adapter.

Source: https://msdn.microsoft.com/en-us/library/jj248697.aspx#BKMK_SoftRequirements

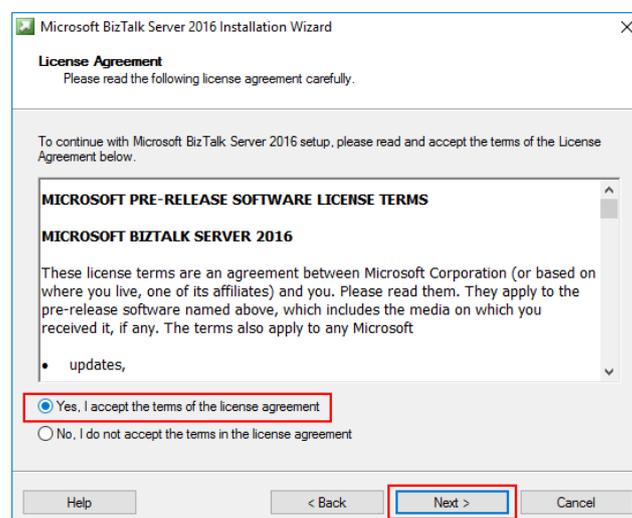
7 Appendix B: Redistributable CAB Files

BizTalk Server relies on diverse products and technologies to provide essential services and features. If not already present, some software that is required by BizTalk Server is installed on your computer during the BizTalk installation process, such as:

- Microsoft SQL XML 4.0 with Service Pack 1
- Microsoft Office Web Components
- Microsoft ADO MD.Net 9.0
- Microsoft ADO MD.Net 10.0

Microsoft BizTalk Server 2016 Installation Wizard, in the “Redistributable Prerequisites” screen, gives you the option to:

- **MANUALLY INSTALL THE REDISTRIBUTABLE PREREQUISITES:** By selecting this option you are choosing that you want to manually install the redistributable files that are required for the installation process to continue. In this case the installation process is canceled.
- **AUTOMATICALLY INSTALL THE REDISTRIBUTABLE PREREQUISITES FROM THE WEB:** By selecting this option the Wizard will download and install the necessary components automatically for you. The disadvantage is that this option requires an internet connection.
- **DOWNLOAD THE REDISTRIBUTABLE PREREQUISITES CAB FILE:** By selecting this option the Wizard will automatically download the correct version of the redistributable prerequisites CAB file which is compatible with the operating system that is running the Installation Wizard, to your computer so that you can install later and will exit the installation process. Again this option requires an internet connection.
- **AUTOMATICALLY INSTALL THE REDISTRIBUTABLE PREREQUISITES FROM A CAB FILE:** By selecting this option the Wizard will automatically install the redistributable prerequisites from a CAB file that you have previous downloaded. So the disadvantage is that you already must have downloaded the correct CAB file before running the setup but in return you don’t need Internet connection.



The CAB file containing all the prerequisites needed, however, if you are choosing the last option “Automatically install the redistributable prerequisites from a CAB file”:

- Be sure you are using the correct CAB file according to your language and operating system.
- And you cannot use CAB files from previous versions of BizTalk Server to install BizTalk Server 2016.

List of Redistributable CAB Files for BizTalk Server 2016

CAB Files for 64-bit Editions (EN)

- Windows Server 2016: <http://go.microsoft.com/fwlink/p/?LinkId=746413>
- Windows Server 2012 R2: <http://go.microsoft.com/fwlink/p/?LinkId=746412>
- Windows 10: <http://go.microsoft.com/fwlink/p/?LinkId=746408>
- Windows 8.1: <http://go.microsoft.com/fwlink/p/?LinkId=746411>

CAB Files for 32-bit Editions (EN)

- Windows 10: <http://go.microsoft.com/fwlink/p/?LinkId=746409>
- Windows 8.1: <http://go.microsoft.com/fwlink/p/?LinkId=746410>

8 Appendix C: Basic Configuration vs. Custom Configuration

BizTalk Server can be configured using Basic Configuration or Custom Configuration.

For helping you decide what kind of configuration you should use consider the following table:

	Basic Configuration	Custom Configuration
BizTalk Groups	Automatically creates local groups. No option to use domain groups.	You enter the domain groups.
SQL Server	Use this option when SQL Server is installed on the BizTalk Server virtual machine.	Use this option when SQL Server is installed on a separate computer (virtual machine).
Database Names	Generated automatically.	You can modify the default values.
Service Account	Microsoft SQL Server 2003 or higher (including Express Edition is supported)	You can enter different accounts for different services.