



Microsoft®

# BizTalk® Server 2013 R2

## Installing BizTalk Server 2013 R2 in a Basic Multi-Computer Environment

There are many things to consider when planning this type of installation, often the network infrastructure already exists and BizTalk Server must coexist with other network applications. This guide describes some of the considerations that apply to the various parts of a BizTalk Server installation in a basic multi-computer environment. This information will help you plan the installation and configuration of BizTalk Server 2013 R2, applications and components on which it depends.

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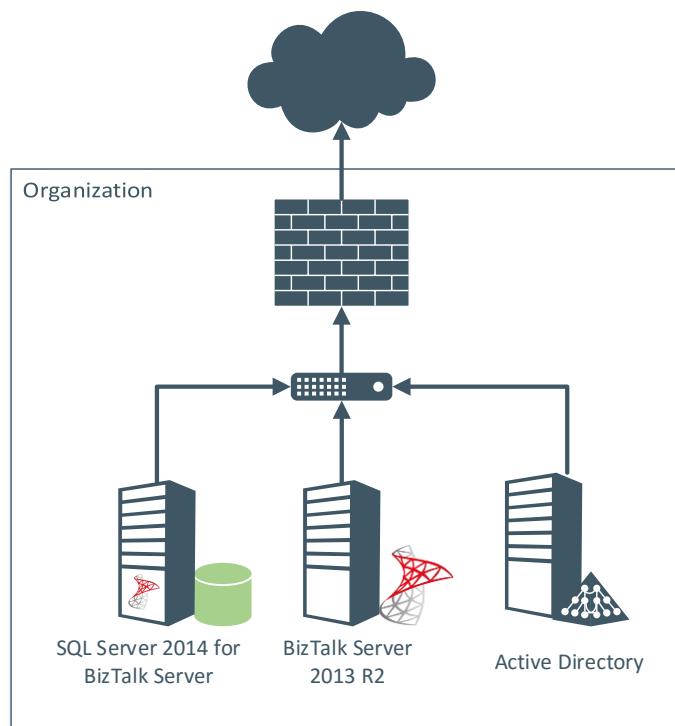
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## BizTalk Server Installation scenario

This article explains how to install Microsoft BizTalk Server 2013 R2 on a basic multi-computer (or basic multi-server), i.e. installation of BizTalk Server with a remote SQL Server (1 SQL Server and 1 BizTalk Server).



There will be 3 virtual servers:

- 1 Domain controller
- 1 Virtual Machine to host SQL Server
  - Windows Server 2012 R2
  - SQL Server 2014 Enterprise Edition
- 1 Virtual Machine to host BizTalk Server.
  - Windows Server 2012 R2
  - BizTalk Server 2013 R2 Development Edition

In this scenario I will perform a basic full installation of Microsoft BizTalk Server 2013 R2, with the exception of the SharePoint Adapter and additional components like Accelerators, ESB Toolkit or UDDI, emulating a production environment. 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

And we assume that all machines are already installed with the operating system and latest critical Windows updates from Microsoft. Another presumption is that the domain controller is already installed and configured (this article will not explain this step)

## The need for a Domain Controller - Windows Groups and Service Accounts

A very important difference between a single server and a multi-server installation is that the multi-server configuration requires you to use domain users and groups to run the various BizTalk services making having a domain controller a necessity. These domain accounts and groups are used for the security configuration of the BizTalk Server databases.

Because BizTalk and SQL are installed on a separate machine, the use of a domain user account is therefore a necessity so that the account can have access rights on both the BizTalk machine and the SQL Server machine.

### Create Domain Groups and Users.

The BizTalk setup procedure is not able to create the Windows Groups and Users on a Domain Controller, so on a multi-computer installation, BizTalk Windows Groups and Users must be created manually on the Domain Controller.

The following information will be useful in creating these groups and accounts.

- In a multicomputer environment, BizTalk Server supports only domain groups and domain service accounts.
- BizTalk Server 2013 R2 supports only <NetBIOSDomainName>\<User> name formats for Windows groups and service accounts.
- BizTalk Server supports only Active Directory domain groups and user accounts in multi-computer configurations. Domain groups include Domain Local groups, Global groups, and Universal groups, which are supported in both single computer and multi-computer environments.
- Built-in accounts such as NT AUTHORITY\LOCAL SERVICE, NT AUTHORITY\NETWORK SERVICE, NT AUTHORITY\SERVICE, NT AUTHORITY\SYSTEM, and Everyone are not supported when you install and configure BizTalk Server 2013 R2 in a multi-computer environment.
- For more information see [Installation Overview for BizTalk Server 2013 and 2013 R2](#).

Use the default group names whenever possible. The BizTalk Server setup automatically enters the default groups. If there are multiple BizTalk Server groups within the Domain, you can change the names to avoid conflicts.

### Planning the use of a new Organizational Unit

To keep things tidy, we can place the BizTalk Users and Groups in an Organizational Unit (OU), it is a good practice to utilize a new Organizational Unit (OU) to create all groups, user accounts and service accounts that we will use in the configuration of BizTalk Server 2013 R2.

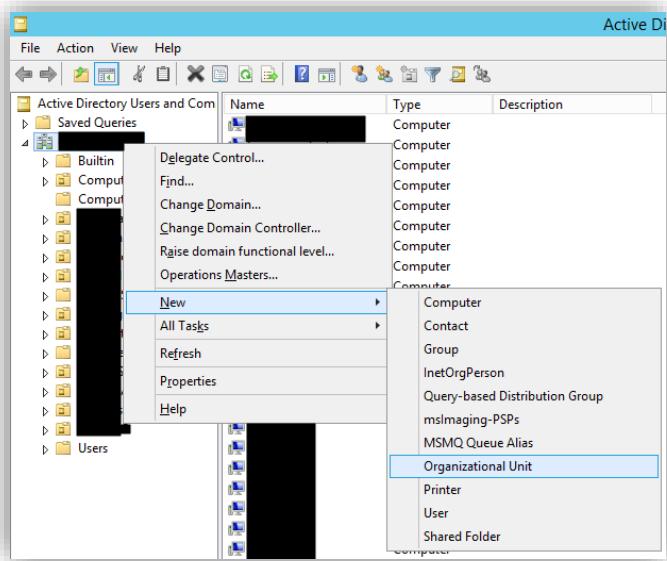
OU are Active Directory containers into which you can place users, groups, computers, and other organizational units. By using them you can create containers within a domain that represent the hierarchical or logical structures within your organization.

To create a new OU follow these steps:

- Press the “Windows key” to switch to the Start screen.
- Type “Active Directory” and click in “Active Directory Users and Computers” option from the Search menu



- Right-click on the domain name and select New→Organizational Unit.



- Enter “BizTalk” or “BizTalk Server Group” as the name of the new ‘Organizational Unit Object’, Ensure to check “Protect container from accidental deletion” and press “OK”

## Windows Groups Used In BizTalk Server

The following table lists the Windows groups and their membership used by BizTalk Server.

**Note:** must be created within the OU created earlier

Group	Group Description	Membership	SQL Server Roles or Database Roles
SSO Administrators	Administrator of the Enterprise Single Sign-On (SSO) service. For more information about SSO accounts, see "How to Specify SSO Administrator and Affiliate Administrators Accounts" at <a href="http://go.microsoft.com/fwlink/?LinkId=89383">http://go.microsoft.com/fwlink/?LinkId=89383</a> .	Contains service accounts for Enterprise Single Sign-On service.  Contains users/groups that need to be able to configure and administer BizTalk Server and SSO service.  Contains accounts used to run BizTalk Configuration Manager when configuring SSO master secret server.	db_owner SQL Server Database Role for the SSO  securityadmin SQL Server Role for the SQL Server where SSO is located
SSO Affiliate Administrators	Administrators of certain SSO affiliate applications.  Can create/delete SSO affiliate applications, administer user mappings, and set credentials for affiliate	Contains no service accounts.  Contains account used for BizTalk Server Administrators.	

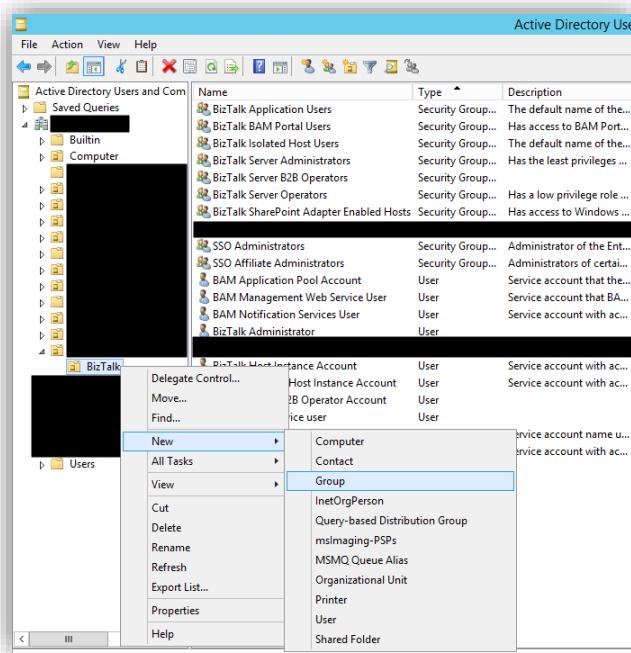
	application users.		
BizTalk Server Administrators	<p>Has the fewest privileges necessary to perform administrative tasks.</p> <p>Can deploy solutions, manage applications, and resolve message processing issues.</p> <p>To perform administrative tasks for adapters, receive and send handlers, and receive locations, the BizTalk Server Administrators must be added to the Single Sign-On Affiliate Administrators.</p> <p>For more information, see "Managing BizTalk Server Security" in at <a href="https://msdn.microsoft.com/en-us/library/aa578061.aspx">https://msdn.microsoft.com/en-us/library/aa578061.aspx</a>.</p>	<p>Contains users/groups that need to be able to configure and administer BizTalk Server.</p>	<p><b>BTS_ADMIN_USERS</b> SQL Server Database Role in the following databases:</p> <ul style="list-style-type: none"> <li>• BizTalkMgmtDb</li> <li>• BizTalkMsgBoxDb</li> <li>• BizTalkRuleEngineDb</li> <li>• BizTalkDTADb</li> <li>• BAMPrimaryImport</li> </ul> <p><b>db_owner</b> SQL Server Database Role for the following databases:</p> <ul style="list-style-type: none"> <li>• BAMStarSchema</li> <li>• BAMPrimaryImport</li> <li>• BAMArchive</li> <li>• BAMAlertsApplication</li> <li>• BAMAlertsNSMain</li> </ul> <p><b>NSAdmin</b> SQL Server Database Role in the following databases:</p> <ul style="list-style-type: none"> <li>• BAMAlertsApplication</li> <li>• BAMAlertsNSMain</li> </ul> <p><b>OLAP Administrators</b> on the computer hosting the BAMAnalysis OLAP database.</p>
BizTalk Server Operators	Has a low privilege role with access only to monitoring and troubleshooting actions.	<p>Contains user/groups that will monitor solutions.</p> <p>Contains no service accounts.</p>	<p><b>BTS_OPERATORS</b> SQL Server Database Role in the following databases:</p> <ul style="list-style-type: none"> <li>• BizTalkDTADb</li> <li>• BizTalkEDIDb</li> <li>• BizTalkMgmtDb</li> <li>• BizTalkMsgBoxDb</li> <li>• BizTalkRuleEngineDb</li> </ul>
BizTalk Server B2B Operators	A new BizTalk role that reduces the onus on the Administrators to perform all Party management operation. This role allows windows users associated with the role to perform all party management operations.	Contains users/groups that must be able to configure and administer BizTalk Server TPM data and monitor solutions.	<p><b>BTS_OPERATORS</b> SQL Server Database Role in the following databases:</p> <ul style="list-style-type: none"> <li>• BizTalkDTADb</li> <li>• BizTalkMgmtDb</li> <li>• BizTalkMsgBoxDb</li> <li>• BizTalkRuleEngineDb</li> <li>• BAMPrimaryImport</li> </ul>
BizTalk Application Users	<p>The default name of the first In-Process BizTalk Host Group created by Configuration Manager.</p> <p>Use one BizTalk Host Group for each In-Process host in your environment.</p> <p>Includes accounts with access to In-Process BizTalk Hosts (hosts processes in BizTalk Server, BTSNTSvc.exe).</p>	Contains service accounts for the BizTalk In-Process host instance in the host that the BizTalk Host Group is designated for.	<p><b>BTS_HOST_USERS</b> SQL Server Database Role in the following databases:</p> <ul style="list-style-type: none"> <li>• BizTalkMgmtDb</li> <li>• BizTalkMsgBoxDb</li> <li>• BizTalkRuleEngineDb</li> <li>• BizTalkDTADb</li> </ul>

			<ul style="list-style-type: none"> <li>BAMPrimaryImport</li> </ul> <p><b>BAM_EVENT_WRITER SQL</b> Server Database Role in the BAMPrimaryImport</p>
BizTalk Isolated Host Users	<p>The default name of the first Isolated BizTalk Host Group created by Configuration Manager. Isolated BizTalk hosts not running on BizTalk Server, such as HTTP and SOAP.</p> <p>Use one BizTalk Isolated Host Group for each Isolated Host in your environment.</p>	<p>Contains service accounts for the BizTalk Isolated host instance in the host that the Isolated BizTalk Host Group is designated for.</p>	<p><b>BTS_HOST_USERS SQL</b> Server Database Role in the following databases:</p> <ul style="list-style-type: none"> <li>BizTalkMgmtDb</li> <li>BizTalkMsgBoxDb</li> <li>BizTalkRuleEngineDb</li> <li>BizTalkDTADb</li> <li>BAMPrimaryImport</li> </ul>
BAM Portal Users	Has access to BAM Portal Web site.	<p>Everyone group is used for this role by default.</p> <p>Contains no service accounts.</p>	
BizTalk SharePoint Adapter Enabled Hosts	Has access to Windows SharePoint Services Adapter Web Service.	Contains service accounts for the BizTalk host instance to be able to call SharePoint Adapter.	

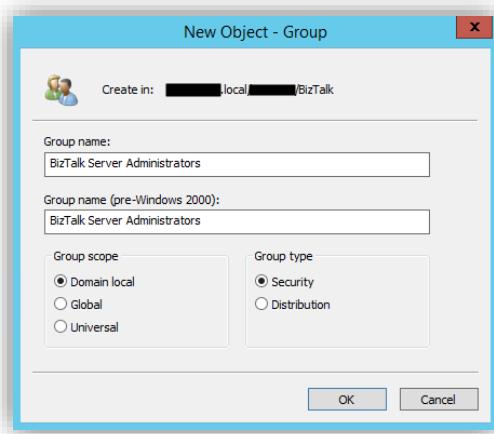
For more information about BizTalk Server groups and accounts see: [Windows Groups and User Accounts in BizTalk Server](#) and for more information regarding to BizTalk Server Security see [Managing BizTalk Server Security](#).

To create a new Group follow these steps:

- Press the “Windows key” to switch to the Start screen.
- Type “Active Directory” and click in “Active Directory Users and Computers” option from the Search menu.
- Select the OU create earlier: “BizTalk” or “BizTalk Server Group”. Right-click on the OU name and select New→Group.



- Enter the Group name of the new Group and ensure to select “Group scope” as “Domain local” or “Global” and “Group Type” as “Security”, press “OK”.



- Repeat all the steps for the remaining groups.

## IIS\_WPG and IIS\_IUSRS Group

IIS\_WPG group it is a group provided by IIS 6.0 that provides the minimum set of user rights and permissions required to run an application but unfortunately for us this group doesn't exist anymore. Its equivalent on IIS7 is the IIS\_IUSRS group.

IIS\_IUSRS is another group used by BizTalk Server 2013 R2, however, unlike the previous groups we do not need to create this because it is a built-in group with access to all the necessary file and system resources so that an account, when added to this group, can seamlessly act as an application pool identity.

You don't need to create the IIS\_WPG group, unless you are thinking in use Microsoft BizTalk Accelerator for RosettaNet. In this case you need to manual create the IIS\_WPG group otherwise the BizTalk Accelerator for RosettaNet configuration will fail with the following error: *“Failed to add member ‘user’ to NT Group IIS\_WPG”*. (For more information see [BizTalk Accelerator for RosettaNet runtime feature failed to configure: Failed to add member ‘user’ to NT Group IIS\\_WPG Error code: -2147022676](#).

## User and Service Accounts Used In BizTalk Server

The following table lists the Windows user or service accounts and group affiliations used by BizTalk Server.

**Note:** must be created within the OU created earlier

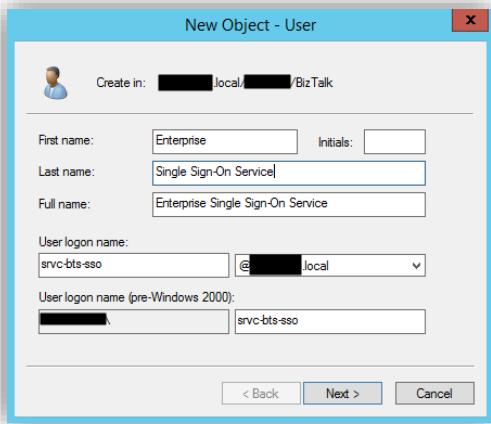
User	User Description	Group Affiliation	SQL Server Roles or Database Roles
<b>Enterprise Single Sign-On Service</b>  Suggestions: <ul style="list-style-type: none"><li>• <i>SsoService</i></li><li>• <i>srvc-bts-sso</i></li><li>• <i>SsoAdmin</i></li><li>• <i>usr-sso-admin</i></li></ul>	Service account used to run Enterprise Single Sign-On Service, which accesses the SSO database.  User account for the SSO Administrator.	SSO Administrators	

<b>OPTIONAL: Single Sign-On affiliate User</b>	User accounts for SSO Affiliate Administrators  Suggestions: <ul style="list-style-type: none"><li>• <i>SsoAffiliate</i></li><li>• <i>usr-sso-affiliate</i></li></ul>	SSO Affiliate Administrators	
<b>BizTalk Host Instance Account</b>	Service account used to run BizTalk In-Process host instance which access In-Process BizTalk host instance (BTNTSVC).  Suggestions: <ul style="list-style-type: none"><li>• <i>BTSHostSrvc</i></li><li>• <i>srcv-bts-host</i></li></ul>	BizTalk Application Users	
<b>BizTalk Isolated Host Instance Account</b>	Service account used to run BizTalk Isolated host instance (HTTP/SOAP).  Suggestions: <ul style="list-style-type: none"><li>• <i>BTIsolatedHostSrvc</i></li><li>• <i>srcv-bts-isol-host</i></li></ul>	BizTalk Isolated Host Users  IIS_IUSRS (or/and IIS_WPG)	
<b>Rule Engine Update Service</b>	Service account used to run Rule Engine Update Service, which receives notifications to deployment/undeployment policies from the Rule engine database.  Suggestions: <ul style="list-style-type: none"><li>• <i>ReuService</i></li><li>• <i>srcv-bts-rule-engine</i></li></ul>		<b>RE_HOST_USERS</b> SQL Server Database Role in the BizTalkRuleEngineDb
<b>BAM Alerts User (aka BAM Notification Services User)</b>	Service account used to run BAM Notification Services, which accesses the BAM databases.  Suggestions: <ul style="list-style-type: none"><li>• <i>BamAlertsSrvs</i></li><li>• <i>srcv-bts-bam-alerts</i></li><li>• <i>BamService</i></li><li>• <i>srcv-bts-bam-ns</i></li></ul>	SQLServer2008NotificationServicesUser\$<ComputerName>	<b>NSRunService</b> SQL Server Database Role in the following databases: <ul style="list-style-type: none"><li>• <i>BAMAlertsApplication</i></li><li>• <i>BAMAlertsNSMain</i></li></ul> <b>BAM_ManagementNSReader</b> SQL Server role for the BAMPrimaryImport
<b>BAM Management Web Service User</b>	User account for BAM Management Web service (BAMManagementService) to access various BAM resources. BAM Portal calls BAMManagementService with the user credentials logged on the BAM Portal to manage alerts, get BAM definition XML and BAM views.  Suggestions: <ul style="list-style-type: none"><li>• <i>BamWebService</i></li><li>• <i>srcv-bts-bam-ws</i></li><li>• <i>srcv-bts-bam</i></li></ul>	IIS_IUSRS (or/and IIS_WPG)	
<b>BAM Application Pool Account</b>	Application pool account for BAMAppPool, which hosts BAM Portal Web site.  Suggestions: <ul style="list-style-type: none"><li>• <i>BamApp</i></li><li>• <i>srcv-bts-bam-ap</i></li></ul>	IIS_IUSRS (or/and IIS_WPG)	
<b>BizTalk Administrator</b>	User need to be able to configure and administer BizTalk Server.  Suggestions: <ul style="list-style-type: none"><li>• <i>BTSAadm</i></li></ul>	BizTalk Server Administrators	

• <i>usr-bts-admin</i>			
<b>OPTIONAL: BizTalk Server Operator User</b>  Suggestions: <ul style="list-style-type: none"><li>• <i>BTSOperator</i></li><li>• <i>usr-bts-operator</i></li></ul>	User account that will monitor solutions	BizTalk Server Operators	
<b>OPTIONAL: BizTalk Server B2B Operator User</b>  Suggestions: <ul style="list-style-type: none"><li>• <i>BTSB2BOperator</i></li><li>• <i>usr-bts-b2b-operator</i></li></ul>	User account that will perform all party management operations	BizTalk Server B2B Operators	

To create a new user follow these steps:

- Press the “Windows key” to switch to the Start screen.
- Type “Active Directory” and click in “Active Directory Users and Computers” option from the Search menu.
- Select the OU create earlier: “BizTalk” or “BizTalk Server Group”. Right-click on the OU name and select New→User.
- Enter the First and Last name and the User logon name of the new User. Press Next.



- Enter the password and password confirmation and ensure to select “Password never expires”, press “Next”.
- Repeat all the steps for the remaining groups.

## Summary of users and Groups Affiliation

Group	Accounts
SSO Administrators	<b>Enterprise Single Sign-On Service</b>  Suggestions: <ul style="list-style-type: none"><li>• <i>SsoService</i></li><li>• <i>srvc-bts-sso</i></li><li>• <i>SsoAdmin</i></li><li>• <i>usr-sso-admin</i></li></ul>

	<b>BizTalk Server Administrators group</b>
SSO Affiliate Administrators	<p><b>Single Sign-On affiliate User</b></p> <p>Suggestions:</p> <ul style="list-style-type: none"> <li>• <i>SsoAffiliate</i></li> <li>• <i>usr-sso-affiliate</i></li> </ul>
BizTalk Server Administrators	<p><b>BizTalk Administrator</b></p> <p>Suggestions:</p> <ul style="list-style-type: none"> <li>• <i>BTSAdm</i></li> <li>• <i>usr-bts-admin</i></li> </ul> <p><b>Your user (suggestion) or sometimes Domain Admin</b></p>
BizTalk Application Users	<p><b>BizTalk Host Instance Account</b></p> <p>Suggestions:</p> <ul style="list-style-type: none"> <li>• <i>BTSHostSrv</i></li> <li>• <i>srvc-bts-host</i></li> </ul>
BizTalk Isolated Host Users	<p><b>BizTalk Isolated Host Instance Account</b></p> <p>Suggestions:</p> <ul style="list-style-type: none"> <li>• <i>BTSIsolatedHostSrv</i></li> <li>• <i>srvc-bts-isol-host</i></li> </ul>
BAM Portal Users	<p><b>Everyone group is used for this role by default.</b></p> <p><b>Domain Users (suggestion)</b></p>
IIS_IUSRS Group (or/and IIS_WPG)	<p><b>BizTalk Isolated Host Instance Account</b></p> <p>Suggestions:</p> <ul style="list-style-type: none"> <li>• <i>BTSIsolatedHostSrv</i></li> <li>• <i>srvc-bts-isol-host</i></li> </ul> <p><b>BAM Management Web Service User</b></p> <p>Suggestions:</p> <ul style="list-style-type: none"> <li>• <i>BamWebService</i></li> <li>• <i>srvc-bts-bam-ws</i></li> <li>• <i>srvc-bts-bam</i></li> </ul> <p><b>BAM Application Pool Account</b></p> <p>Suggestions:</p> <ul style="list-style-type: none"> <li>• <i>BamApp</i></li> <li>• <i>srvc-bts-bam-ap</i></li> </ul>

## SQL Server Service Accounts

The following table lists the Windows service accounts used by SQL Server.

**Note:** must be created within the OU created earlier

User	User Description
<b>SQL Server Agent Service</b>  Suggestions: <ul style="list-style-type: none"><li>• <i>srvc-sql-agent</i></li></ul>	Service account used to run SQL Server Agent.
<b>SQL Server Database Service</b>  • <i>srvc-sql-engine</i>	Service account used to run SQL Server Database.
<b>SQL Server Analysis Service</b>  Suggestions: <ul style="list-style-type: none"><li>• <i>srvc-sql-analysis</i></li></ul>	Service account used to run SQL Server Analysis.
<b>SQL Server Reporting Service</b>  Suggestions: <ul style="list-style-type: none"><li>• <i>srvc-sql-reporting</i></li></ul>	Service account used to run SQL Server Reporting.
<b>SQL Server Integration Service</b>  Suggestions: <ul style="list-style-type: none"><li>• <i>srvc-sql-integration</i></li></ul>	Service account used to run SQL Server Integration.

Alternatively, you can create a single Domain Account to run this services (like “*sql-bts-service*” or “*srvc-sql-bts*”)

Depending on the selection that you made while installing SQL Server, you will have the services installed in your server.

SQL Server Database Services:

- SQL Server Agent
- Analysis Services
- Reporting Services
- Integration Services
- SQL Server Browser
- Full-text search
- SQL Server Active Directory Helper
- SQL Writer

You can configure your SQL Server related services either during the setup or after the installation using the SQL Server configuration Manager.

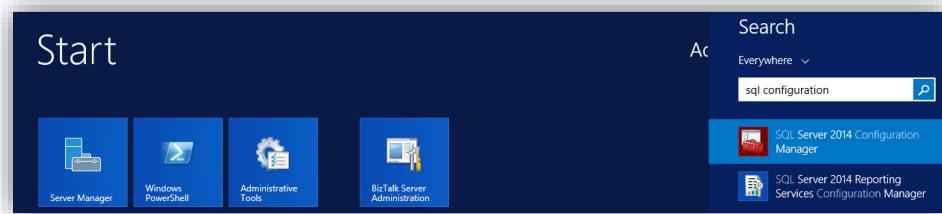
Types of startup accounts:

- **Local User Account:** This user account is created in your server where SQL Server is installed, this account does not have access to network resources.
- **Local Service Account:** This is a built-in windows account that is available for configuring services in windows. This account has permissions as same as accounts that are in the users group, thus it has limited access to the resources in the server. This account is not supported for SQL SERVER and AGENT services.
- **Local System Account:** This is a built-in windows account that is available for configuring services in windows. This is a highly privileged account that has access to all resources in the server with administrator rights.
- **Network Service Account:** This is a built-in windows account that is available for configuring services in windows. This has permissions to access resources in the network under the computer account.
- Domain Account: This account is a part of your domain that has access to network resources for which it is intended to have permission for. It is always advised to run SQL Server and related services under a domain account with minimum privilege need to run SQL Server and its related services.

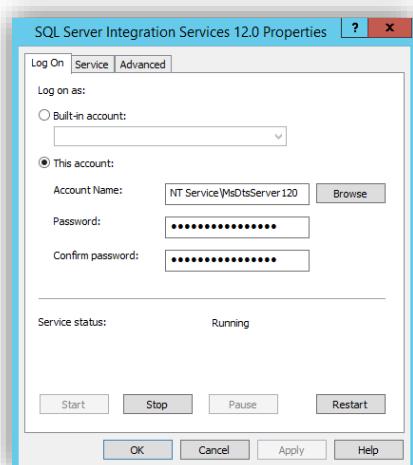
Changing Service Accounts:

SQL Server service accounts can be configured either during installation or using SQL Server configuration Manager. The first one is part of the installation and can be configured during the step Instance Configuration. I would walk you through changing a service account using SQL Server Configuration Manager.

- Press the “Windows key” to switch to the Start screen.
- Type “SQL Configuration” and click in “SQL Server 2014 Configuration manager” option from the Search menu.



- Highlight a service in the right pane, right click for properties.



You can change the built-in account here, else if you would like to change it to a Local User account or a domain user account. If not selected, choose option “This Account” to un-gray it and enter the credentials of a local or a domain user account.

Remember that you will need to restart the SQL Server and related services for the new Service account to take effect.

## References

- [Windows Groups and User Accounts in BizTalk Server](#)
- [Part 3: BizTalk High Availability Server Environment – SQL & BizTalk Active Directory Accounts](#)
- [Installing BizTalk Server 2010 and BAM in a Multi-Computer Environment](#) manual
- [Server Configuration - Service Accounts](#)

## Preparing Computers for Installation - Important considerations before set up the servers.

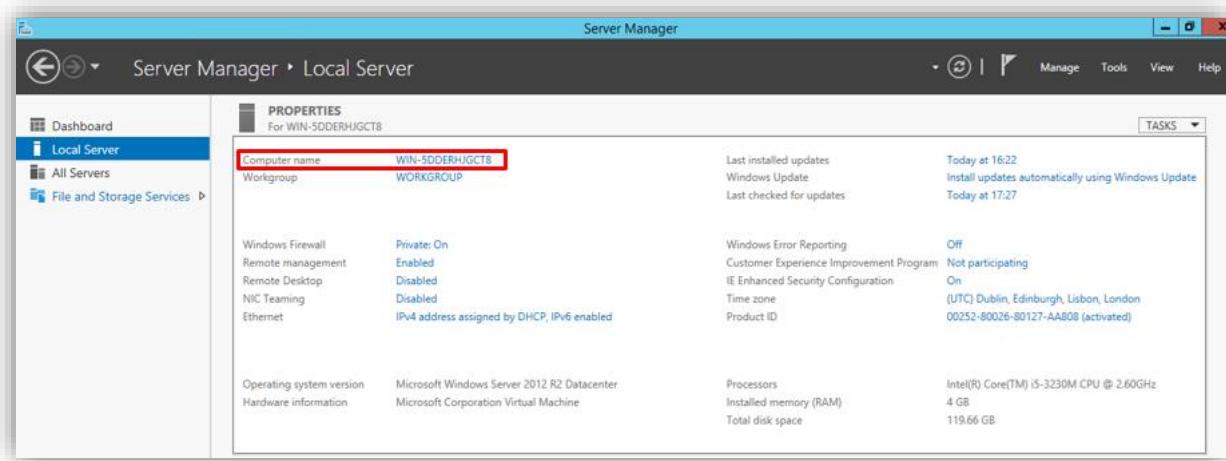
There are some important considerations or suggestions, since these operations are not mandatory, that we can set before starting the installation and configuration of both servers.

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 it easier the installation and configuration process.

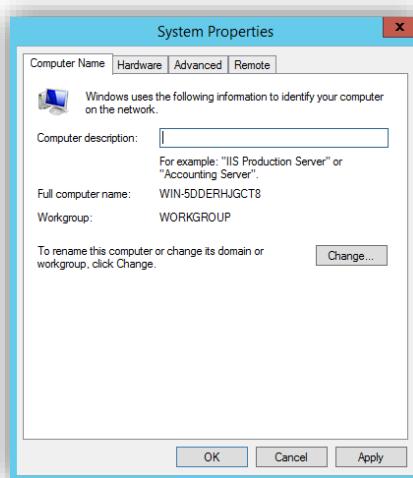
### Change the Machine name

An important consideration that you take into consideration is: **if your computer name is longer than 15 characters, BizTalk Server Configuration will not work.**

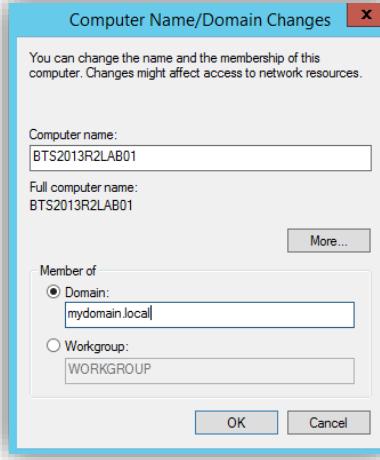
- Start by running the “Server Manager”, if it is not already open, from either:
  - On the Windows taskbar, click the “Server Manager” button
  - On the Start screen, click “Server Manager”.
- In the Server Manager Dashboard, from the scope pane (on the left side) click on “Local Server”.
- In the Server Properties for the “Local Server”, click in the “Computer name” property to be able to change it



- 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.



## Join the Local Administrators Group

To be able to install and configure BizTalk Server 2013 R2, you have to log on the server using a Domain User who has Administrator rights on both the SQL Server and the BizTalk Server.

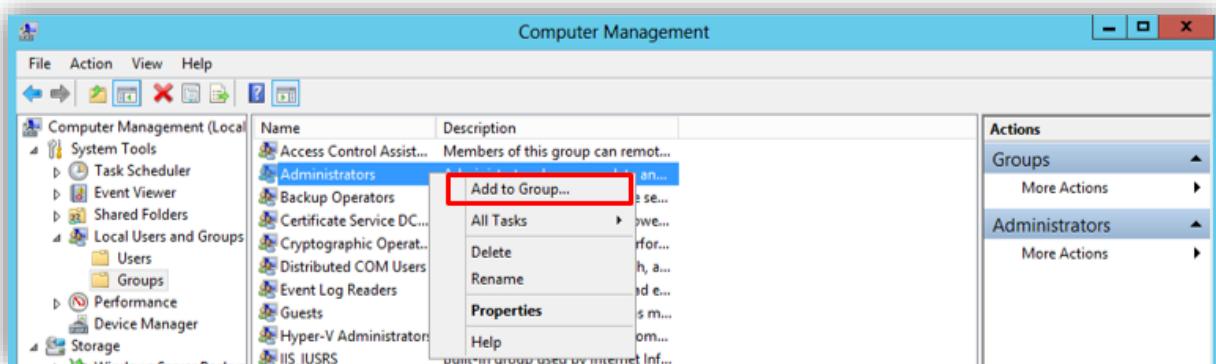
So the next step is to add BizTalk Server Administrators group to the Local Administrators Group in both machines.

To add a member to the Local Administrators Group:

- Press the “Windows key” to switch to the Start screen.
- Type “Computer Management” and click in “Computer Management” option from the Search menu.



- Right-click in the Administrators”, click “Add to Group”, and then click “Add”.



- Add you user account and BizTalk Server Administrators group to the “Administrators” group. In the Select Users, Computers, or Groups dialog box, do the following:

- To add a user account or group account to this group, under “Enter the object names to select”, type the name of the user account or group account that you want to add to the group, and then click “OK”.

By default the Windows Built-in\Administrators group has the *sysadmin* SQL role on the SQL Server.

## The user running the BizTalk Server configuration must belong...

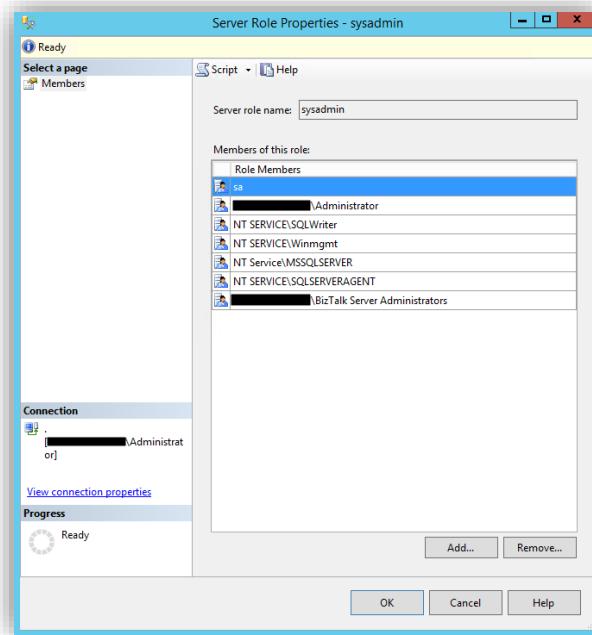
The user running the BizTalk Server configuration must belong to the following user groups:

- To the Administrators group on the local computer
- To the System Administrators group on the SQL Server computer
- To the domain group used for the BizTalk Server Administrators group
- and to the domain group used for the SSO Administrators group

To simplify things put this user on the BizTalk Server Administrators group. After BizTalk Server is configured and installed, the user does not have to be part of the BizTalk Server Administrators group anymore.

Again, by default the Windows Built-in\Administrators group has the *sysadmin* SQL role on the SQL Server.

Once SQL Server is installed, you will be able to check that by opening the SQL Server Management Console, go to “Security\Server Roles” and double click on the “sysadmin” role. The pop up window will show all the windows and SQL logins having the sysadmin role.



## Install Critical Windows Updates

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

To install Windows updates:

- Press the “Windows key” to switch to the Start screen.
- Type “Windows Update” and click in “Windows Update” option from the Search menu.



- Click “Check for updates” and if exist new updates available, install them.

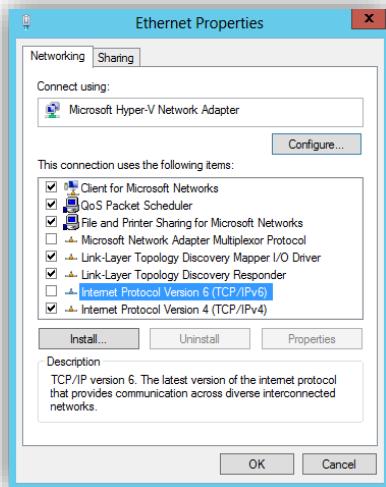


- If prompted, restart your computer.

## Disable IPv6 (optional)

IPv6 is the latest address protocol that will eventually replace IPv4. Windows Server 2012 R2 kept this protocol enabled by default, but it is also a fact that IPv6 is not yet common and many software, routers, modems, and other network equipment do not support it yet. So it may be a wise approach to disable it for now. Also by turning off it will facilitate the process of detecting which port certain application are listening.

IPv6 can be disabled either through the “DisabledComponents” registry value or through the check box for the Internet Protocol Version 6 (TCP/IPv6) component in the list of items on the Networking tab for the properties of connections in the Network Connections folder. The following figure shows an example:



## Turn off Internet Explorer Enhanced Security Configuration (optional)

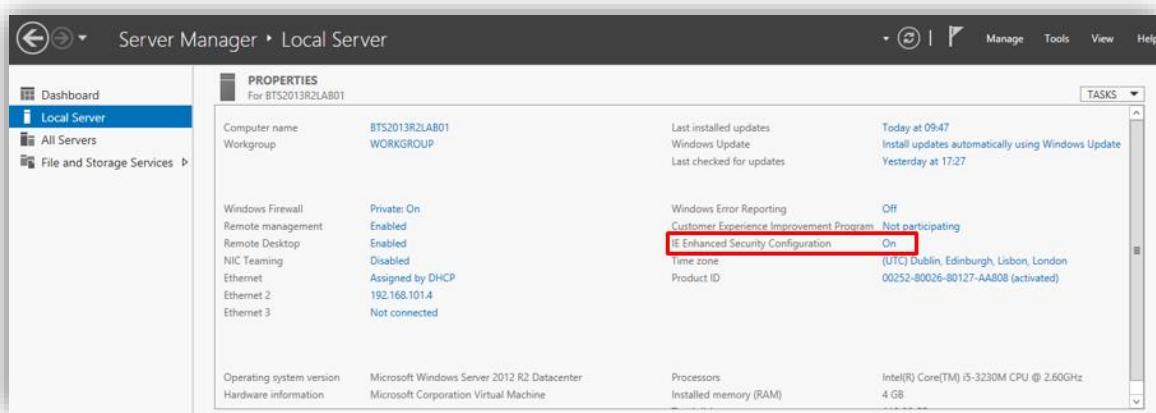
Internet Explorer Enhanced Security Configuration established a configuration for your server and for Microsoft Internet Explorer that decreases the exposure of your server to potential attacks that can occur through Web content and application scripts. As a result, some Web sites may not display or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

By default, Internet Explorer Enhanced Security Configuration is enabled on Windows Server 2012 R2 and can be configured through Server Manager.

To disable Internet Explorer Enhanced Security Configuration (IE ESC) in Windows Server 2012 R2

- Start by running the “Server Manager”, if it is not already open, from either:
  - On the Windows taskbar, click the Server Manager button
  - On the Start screen, click Server Manager.
- 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 2012 R2 settings, even if you are logged on as the administrator - you need elevated privileges - this is by design, and part of the fierce security initiative in Windows Server 2012 R2. 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.

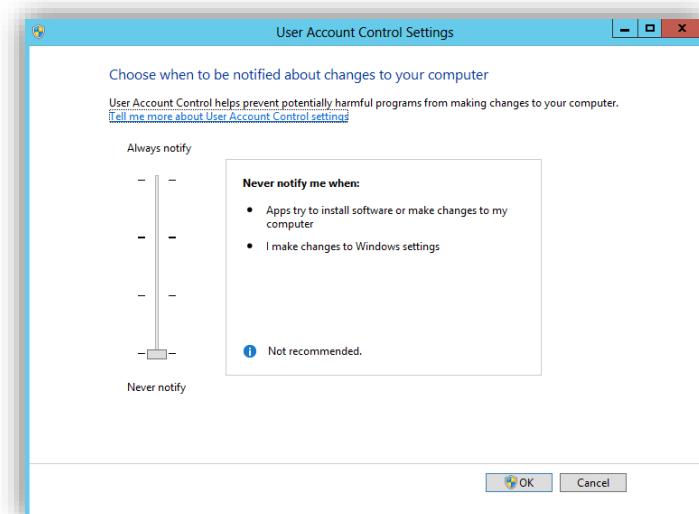
**IMPORTANT NOTE:** It is recommend that you leave UAC on to help make your computer secure. This step is optional and I only suggest to do this in development environments. For some clients this feature can be very important in production environments and they don't want to disable.

To Disable User Account Control (UAC):

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



- Select "Never notify me when..." to disable UAC.



## 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.

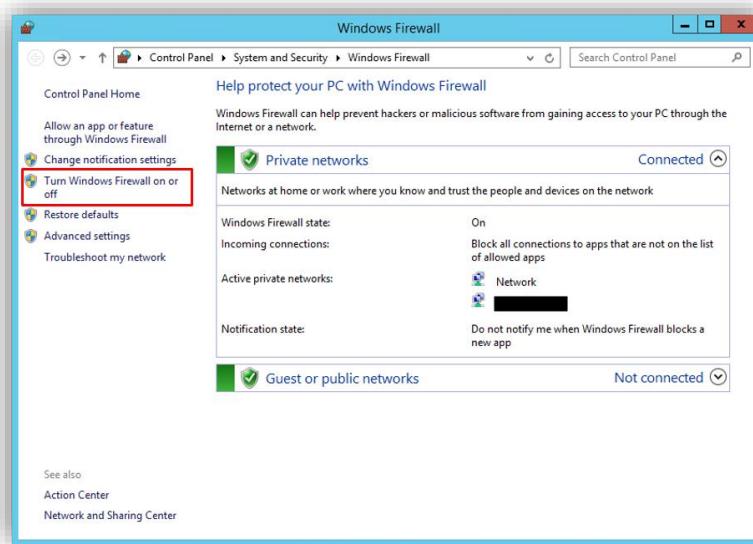
**IMPORTANT NOTE:** This step is optional and I only suggest to do this in development environments. For some clients this feature can be very important in production environments and they don't want to turn off. However, in many scenarios, these machines are not exposed to the outside and even if this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

To turn Windows Firewall off:

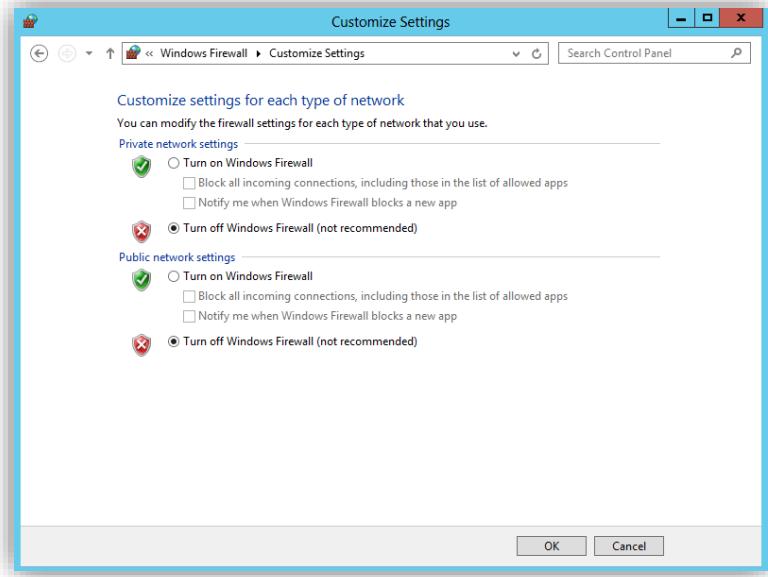
- Press the "Windows key" to switch to the Start screen.
- Type "Windows Firewall" and click in "Windows Firewall" option from the Search menu.



- Select "Turn Windows Firewall on or off" option



- And select the option "Turn off Windows Firewall (not recommended)" in both settings



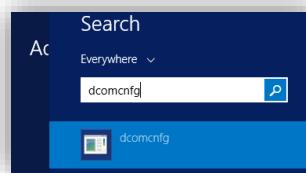
## Configure Microsoft Distributed Transaction Coordinator (MS DTC)

In Windows Server 2012 R2 MSDTC is installed by default.

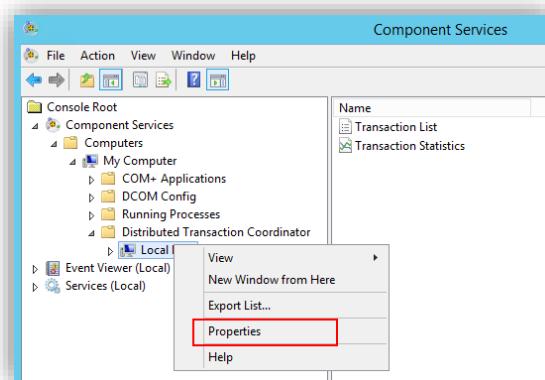
In order for BizTalk to run against its databases located on a remote SQL Server, you will need to turn on MS DTC options in both on the remote SQL Server and in BizTalk Server.

Configure MSDTC on BizTalk and SQL Servers:

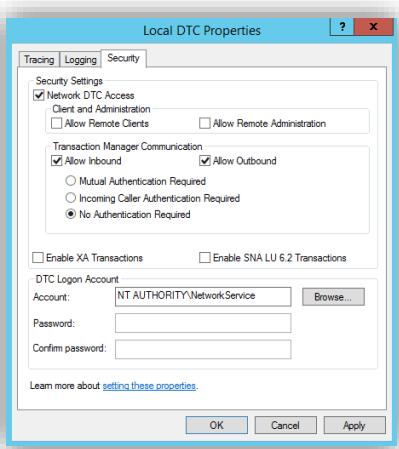
- Press the “Windows key” to switch to the Start screen.
- Type “dcomcnfg” and click in “dcomcnfg” option from the Search menu.



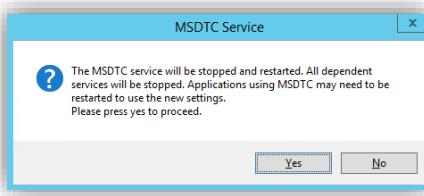
- Under “Component Services”, “My Computer”, “Distributed Transaction Coordinator”, right-click “Local DTC” and select “Properties”.



- 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’



- Click ‘Yes’

**NOTE1:** If you have firewall enable in the machines or the machines are in different networks with limited access (network restriction), it is suggested that a minimum range of 200 ports are set, between ports 49152 to 65535.

- The ephemeral port range from 1025 to 5000 was used by Windows Server 2003 and earlier operating systems, however, there's a Windows 2003 Cumulative Update that changes the port range to 49152-65535.
- The default ephemeral port range starting with Windows Vista/Windows Server 2008 (and newer operating systems) is 49152-65535, as documented [here](#) or [here](#).

**NOTE2:** If you receive COM+ related events or errors because of this setting you can revert it later or increase the ports range accordingly.

#### References:

- [Troubleshooting MSDTC issues with the DTCPing tool](#)
- [How to configure DCOM to listen to a specific ports range](#)

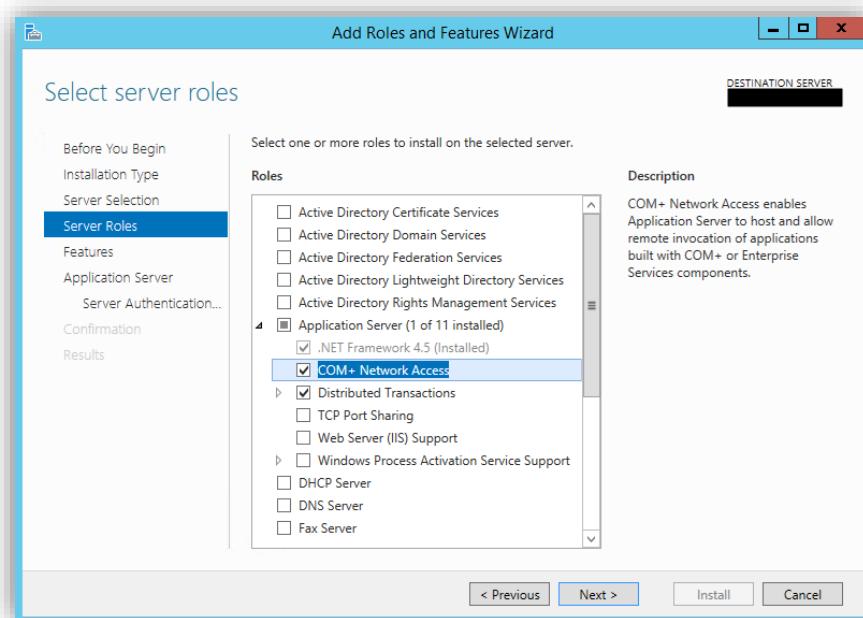
#### COM+ Network Access considerations

COM+ Network Access must also be enabled for all BizTalk and SQL servers. This feature it's turned off by default on Windows Server 2012 R2.

The Application Server role installation process provides an option for enabling COM+ Network Access. When COM+ Network Access is enabled, a firewall exception rule is created that opens port 135.

In order to make DCOM applications work in Windows Server 2012 R2 you need to do install the Application role Application and then select the COM+ network access role service.

- Start by running the “Server Manager”, if it is not already open, from either:
  - On the Windows taskbar, click the “Server Manager” button
  - On the Start screen, click “Server Manager”.
- 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, expand “Application Server” option, select “COM+ Network Access” option and click “Next”.



A quick test of DCOM access is the [DCOM test client/server app](#), however to do this test is still necessary to give permissions at firewall level.

## Preparing and Install SQL Server 2014 machine

This part of the article will focus on installing the SQL Server machine and all necessary requirements and components.

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

### Important considerations before set up the servers

Check if all the considerations described above are implemented:

- Change the machine name
- Join the BizTalk Administrator Group to Local Administrators Group
- Install Critical Windows Updates
- Disable IPv6 (optional)
- Turn off Internet Explorer Enhanced Security Configuration (optional)
- Disable User Account Control (optional)
- Turn Windows Firewall off (optional)
- Configure Microsoft Distributed Transaction Coordinator (MS DTC)
- Enable Network COM+ access

## Install SQL Server 2014

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 or 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

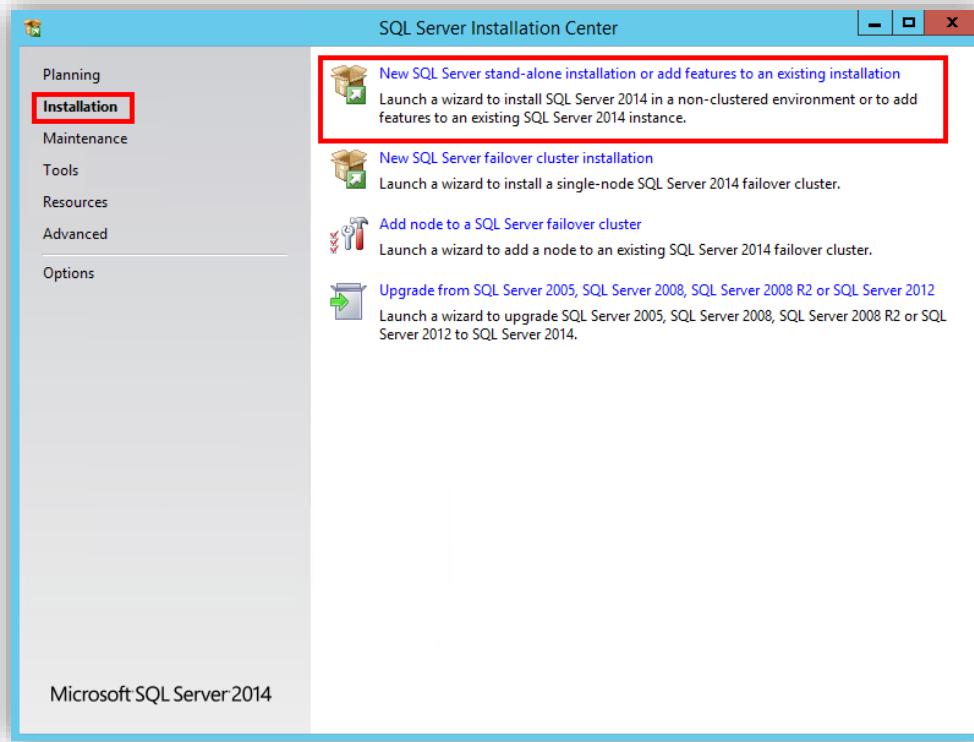
**NOTE:** BizTalk Server supports all case-sensitive and case-insensitive SQL Server collations except for binary collations. Binary collations are not supported.

**NOTE:** Service packs and Windows Updates are supported and should be installed.

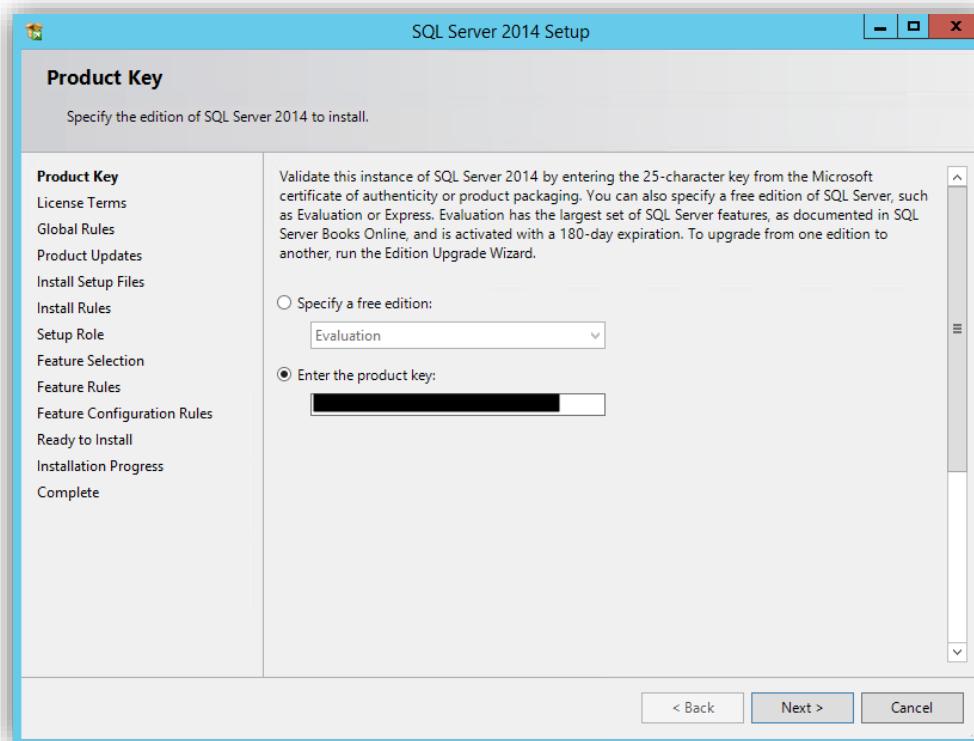
**NOTE:** When BizTalk Server and SQL Server are on separate computers, Distributed Transaction Coordinator (MS DTC) handles the transactions between the computers. The SQL Server AlwaysOn feature does not support MSDTC transactions. **The SQL Server AlwaysOn feature is not supported.**

To install SQL Server 2014:

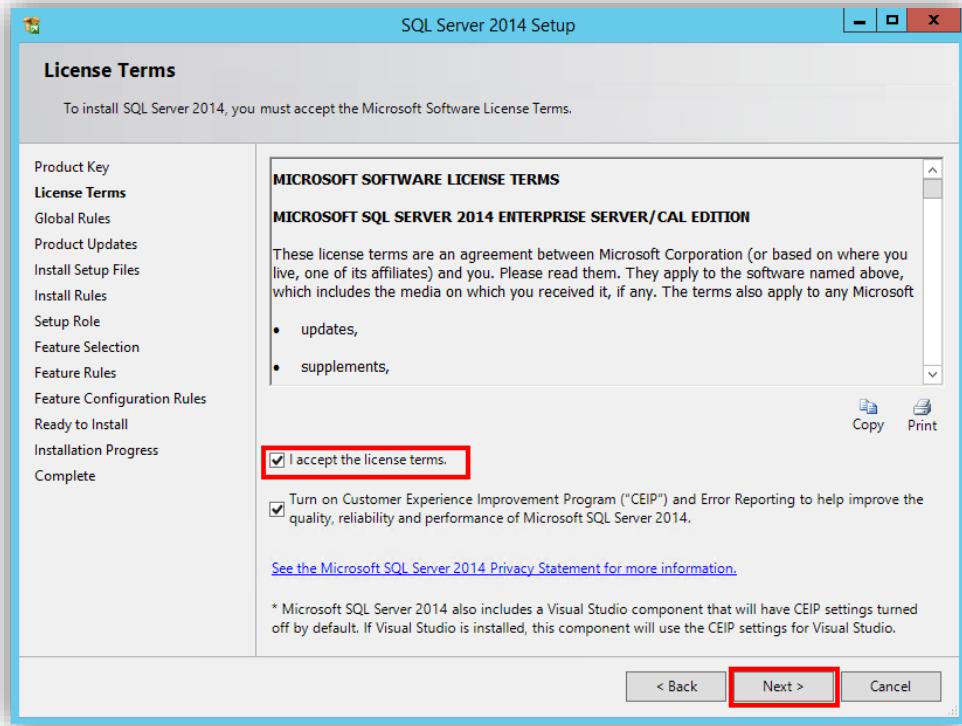
- Insert the SQL Server installation disk into the DVD-ROM drive. The setup program will begin automatically. If prompted for automatic installation of prerequisite software, click “OK”
- On the SQL Server Installation Center, click “Installation” and then click “New SQL Server stand-alone or add features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



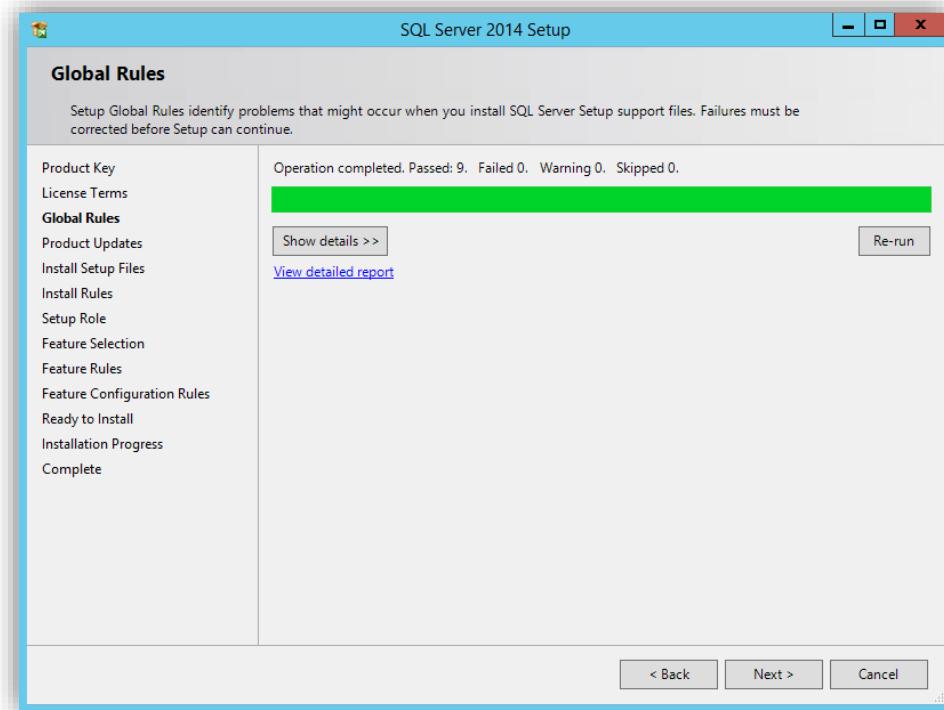
- On the Product Key page, enter your product key and click “Next”



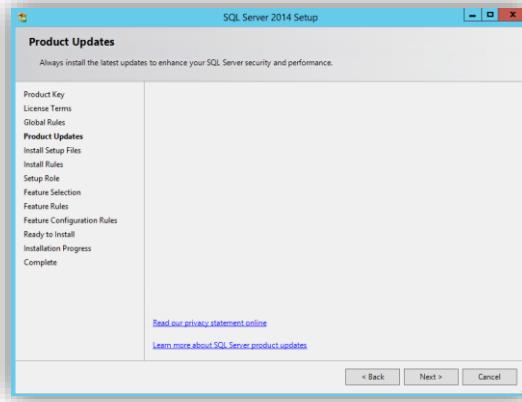
- On the License Terms page, select “I accept the license terms”, and then click “Next”



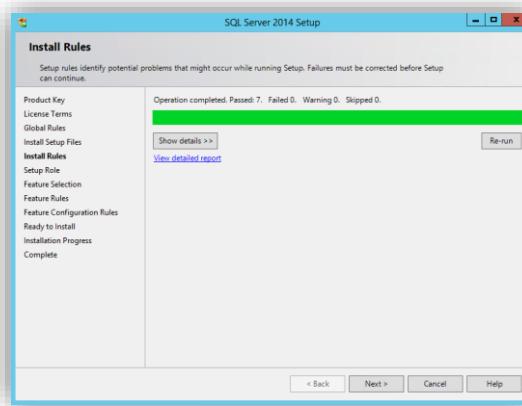
- In the Global Rules page, the setup procedure will automatically advance to the Product Updates window if there are no rule errors. Otherwise review the information and resolve any issues, and then click “Next” to continue.



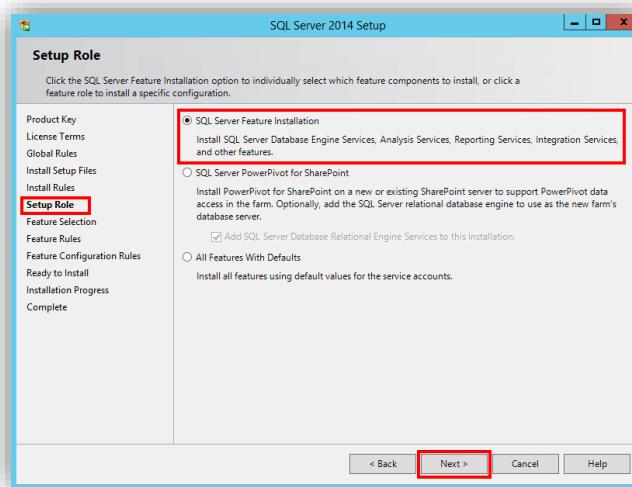
- On the Product Updates page, the latest available SQL Server product updates are displayed. If no product updates are discovered, SQL Server Setup does not display this page and auto advances to the Install Setup Files page. Otherwise review the information and resolve any issues, and then click “Next”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



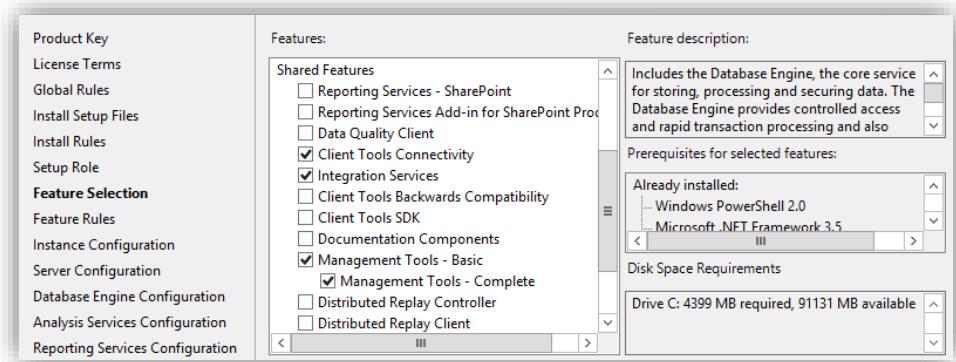
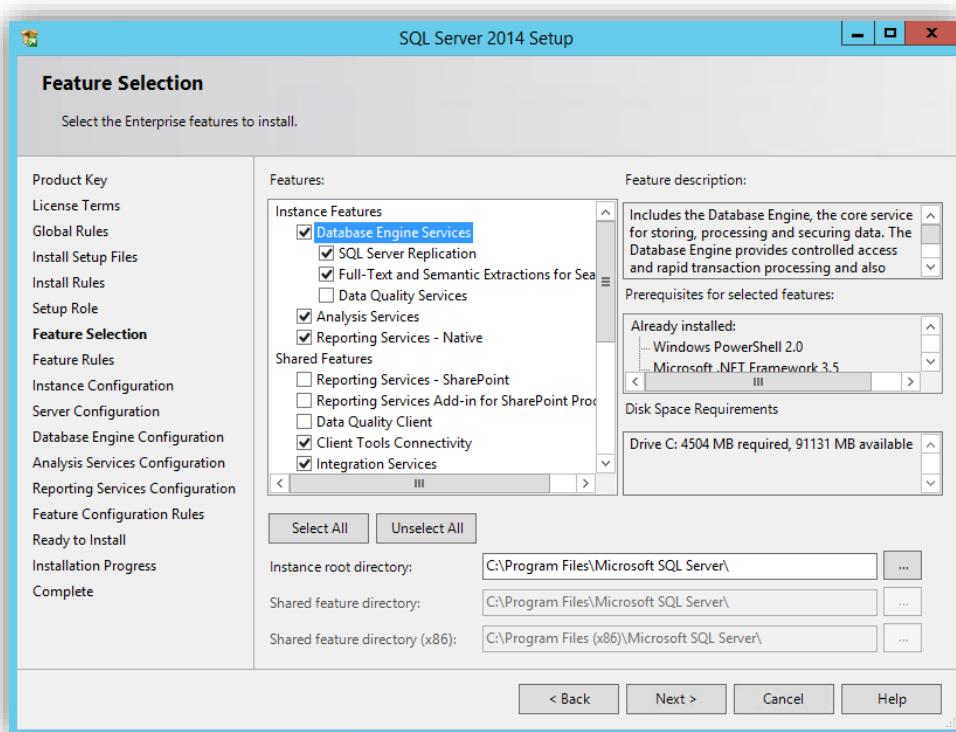
- On the Install Setup files page, Setup provides the progress of downloading, extracting, and installing the Setup files. If an update for SQL Server Setup is found, and is specified to be included, that update will also be installed.
  - The System Configuration Checker verifies the system state of 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 check fails, the setup application will provide the corrective measures to take so installation may proceed. Click on "Next" to continue.



- On the Setup Role page, select "SQL Server Feature Installation", and then click "Next" to continue to the Feature Selection page.

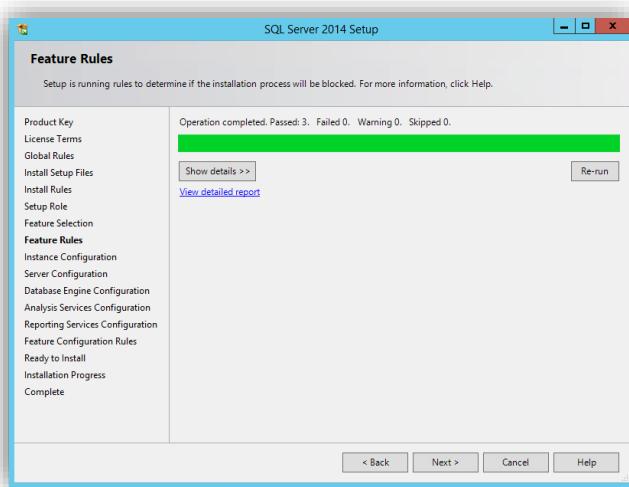


- On the Feature Selection page, select the following features, and then click “Next”
  - Database Engine Services
    - SQL Server Replication
    - Full-Text and Semantic Extractions for Search
  - Analysis Services
  - Reporting Services - Native
  - Shared Features
    - Client Tools Connectivity
    - Integration Services
    - Management Tools - Basic
      - Management Tools - Complete

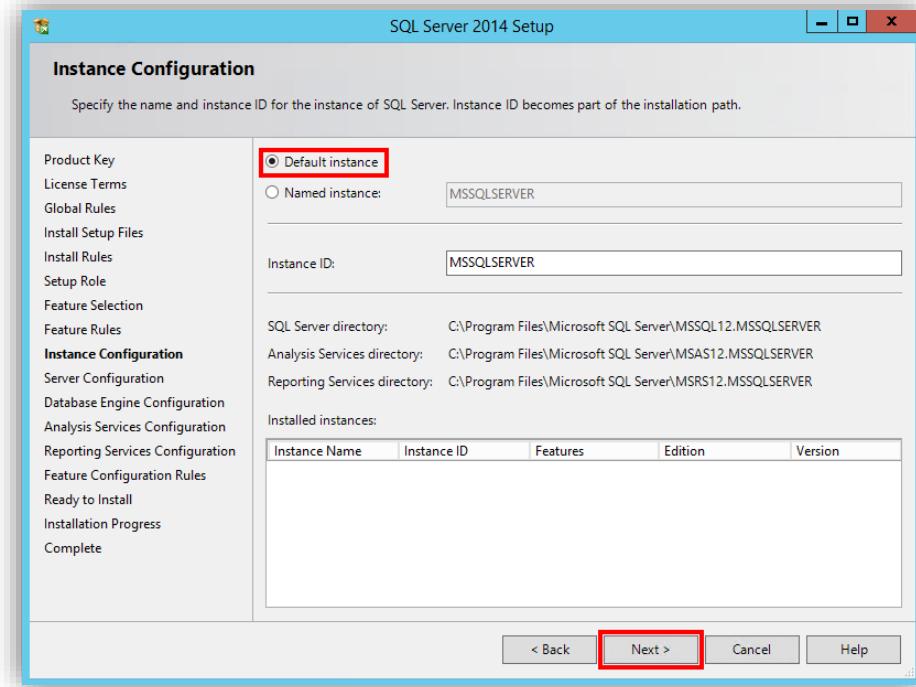


**NOTE:** SQL Server 2014 Data Tools is not included in the default installation of SQL Server 2014. Although not necessary, if you wish to install you can download it here: [Microsoft SQL Server Data Tools - Business Intelligence for Visual Studio 2013](#).

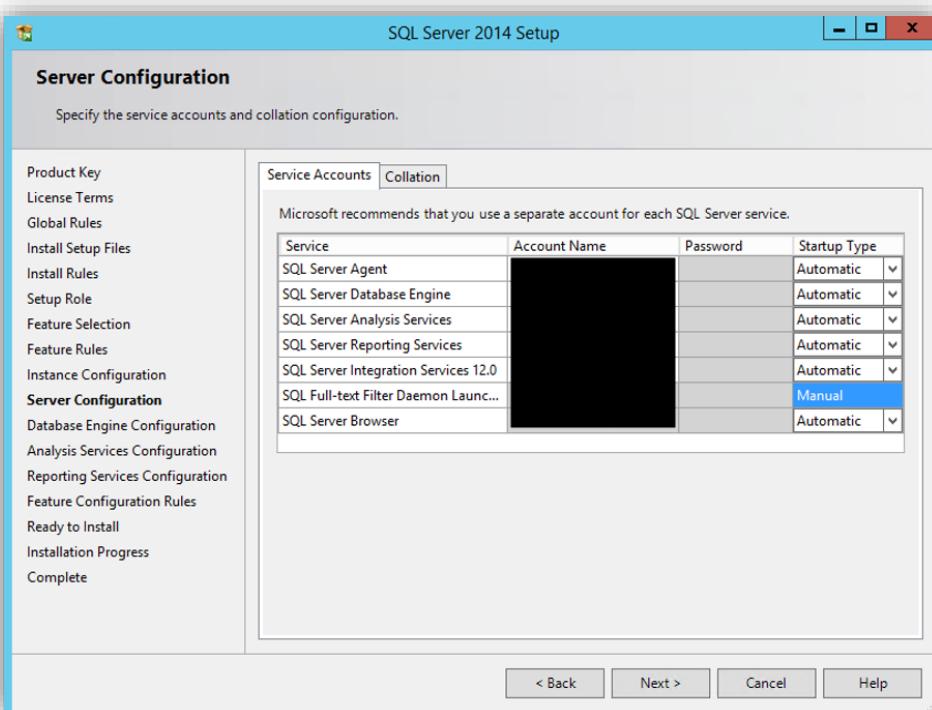
- On the Feature Rules page, Setup verifies the system state of your computer before Setup continues. The Feature Rules page will automatically advance if all rules pass. Otherwise review the information and resolve any issues, and then click “Next” to continue.



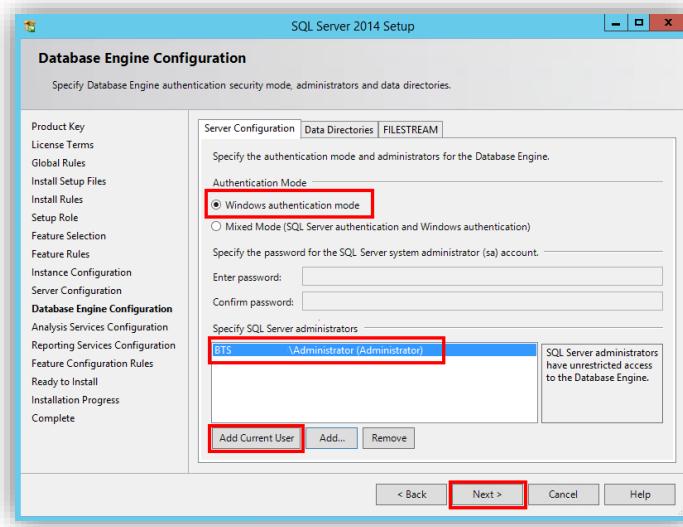
- On the Instance Configuration page select:
  - “Default instance”: Select this option to install a default instance of SQL Server. A computer can host only one default instance; all other instances must be named. However, if you have a default instance of SQL Server installed, you can add a default instance of Analysis Services to the same computer.
  - “Named instance”: Select this option to create a new named instance. Be aware of the following when you name an instance of SQL Server:
    - Instance names are not case sensitive.
    - Instance names cannot start or end with an underscore (\_).
    - Instance names cannot contain the term "Default" or other reserved keywords. If a reserved keyword is used in an instance name, a Setup error will occur. For more information, see [Reserved Keywords \(Transact-SQL\)](#).
    - If you specify “MSSQLServer” for the instance name, a default instance will be created.
    - Instance names are limited to 16 characters.
    - The first character in the instance name must be a letter. Acceptable letters are those defined by the Unicode Standard 2.0. These include Latin characters a-z, A-Z, and letter characters from other languages.
    - Subsequent characters can be letters defined by the Unicode Standard 2.0, decimal numbers from Basic Latin or other national scripts, the dollar sign (\$), or an underscore (\_).
    - Embedded spaces or other special characters are not allowed in instance names. The backslash (\), comma (,), colon (:), semi-colon (;), single quote ('), ampersand (&), and at sign (@) are also not allowed.
  - Leave the rest of the default values, and then click “Next” to continue.



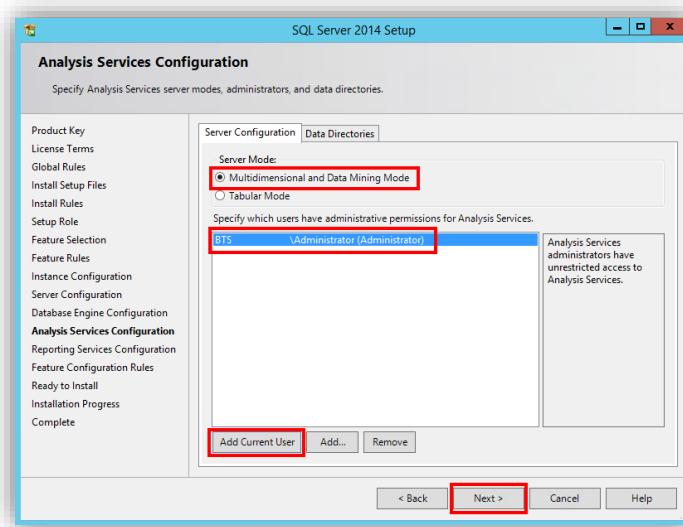
- On the Server Configuration page, you can and you should specify domain login accounts for each SQL Server services (that are described on the [SQL SERVER SERVICE ACCOUNTS](#) section). You can assign the same login account to all SQL Server services, or you can configure each service account individually. 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"



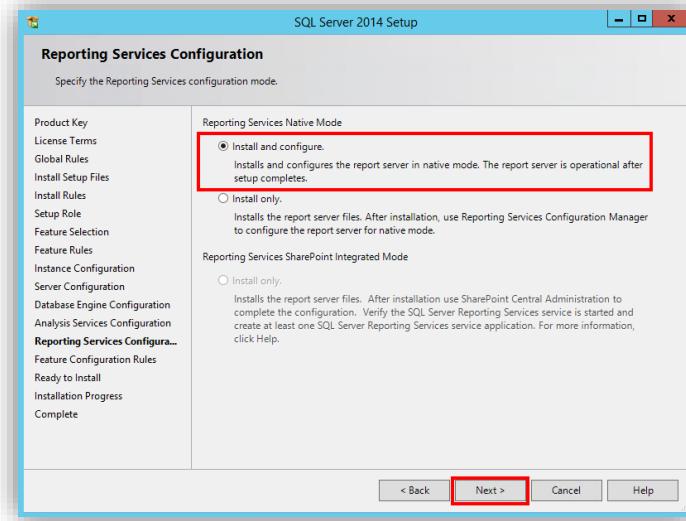
- On the Database Engine Configuration page, select “Windows authentication mode”, click “Add Current User”, and then click “Next”
  - Authentication Mode: Select “Windows authentication mode”. If you select Mixed Mode Authentication, you must provide a strong password for the built-in SQL Server system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



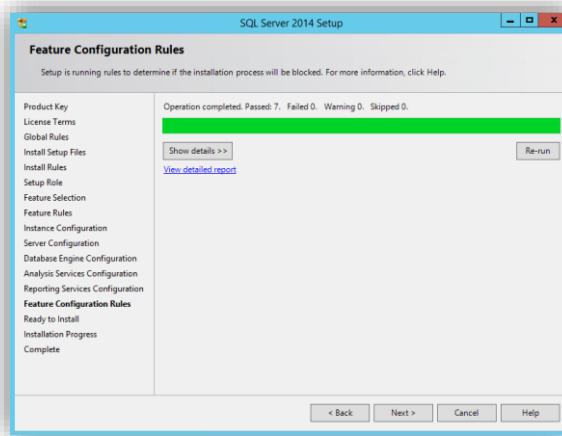
- On the Analysis Services Configuration page, select “Multidimensional and Data mining Mode”, click “Add Current User”, and then click “Next”
  - Server Mode: Select “Multidimensional and Data mining Mode”. Server mode determines which memory and storage subsystems are used on the server. If you plan 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.



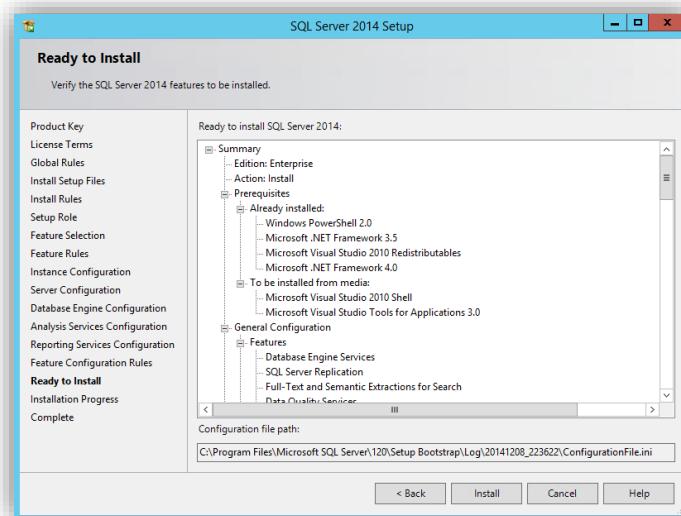
- On the Reporting Services Configuration page, select “Install and configure”, and then click “Next” to continue.



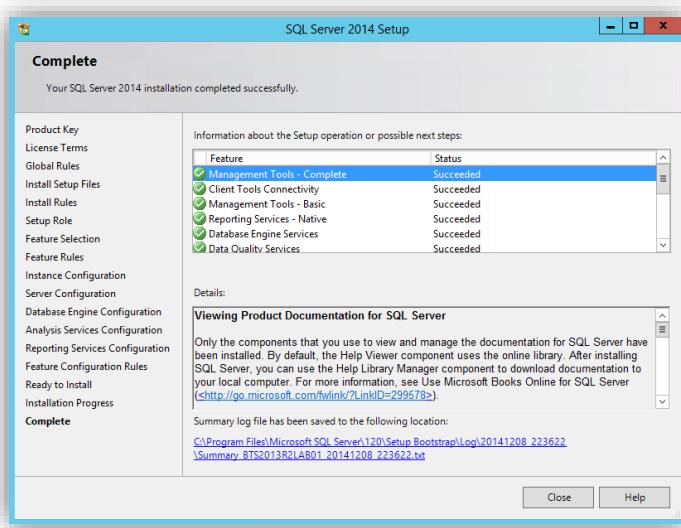
- On the Feature Configuration Rules page, this is another steep to checks if everything is fine, setup will automatically advance to the next page if all rules pass. Otherwise review the information and resolve any issues, and then click “Next”



- On the Ready to Install page, review the information, and then click “Install”



- On the Complete page, click “Close”



**NOTE:** Once again, after this installation, I like to do a Windows update, this step is not necessary.

**NOTE:** Service packs and Windows Updates are supported and should be installed.

## Configure SQL Server Database Mail feature

If you wish to configure BAM Alerts on your BizTalk Server 2013 R2 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 2014 or SQL Server 2012 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 bellow.

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 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 will be the local SMTP Server that we previous install and configure.

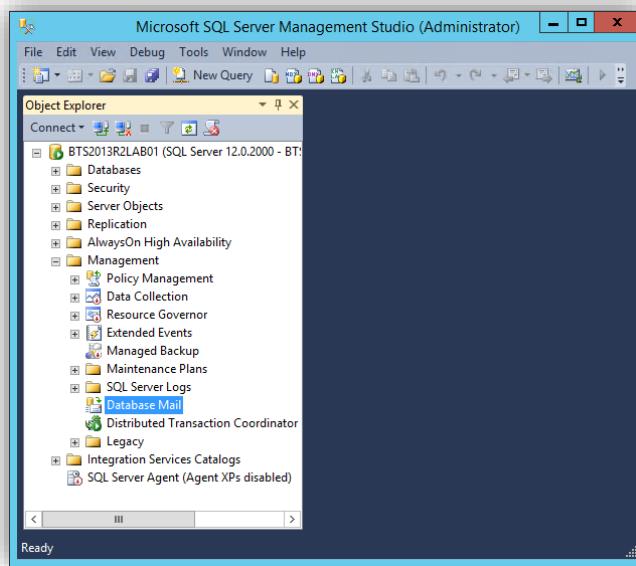
To Configure SQL Server Database Mail Account:

- Press the “Windows key” to switch to the Start screen, type “SQL Management” or “SQL” and click in “SQL Server 2014 Management Studio” option from the Search menu

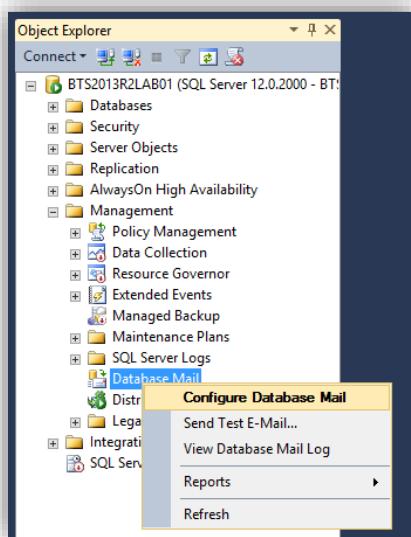


- In Object Explorer panel, connect to the SQL Server instance you want to configure Database Mail on, and expand the server tree.

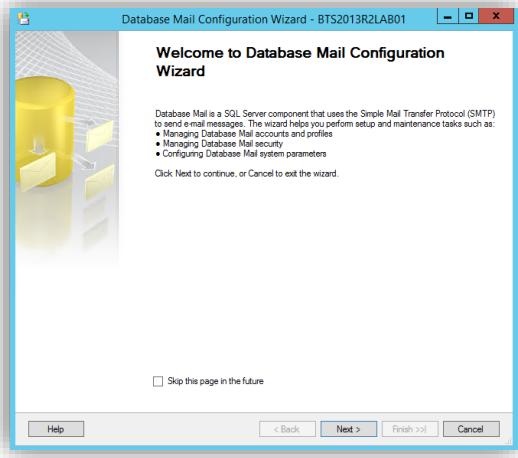
- Expand the “Management” node



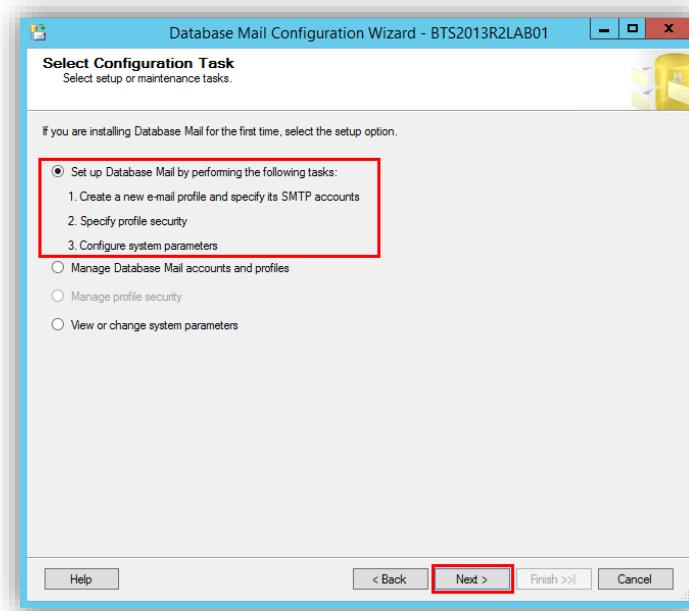
- Double click “Database Mail” to open the Database Mail Configuration Wizard.
  - Or right click under “Database Mail” and select the option “Configure Database Mail”



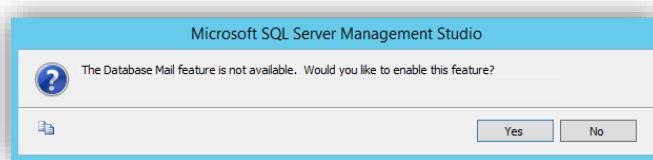
- On the Welcome to Database Mail Configuration Wizard page, click “Next” to continue



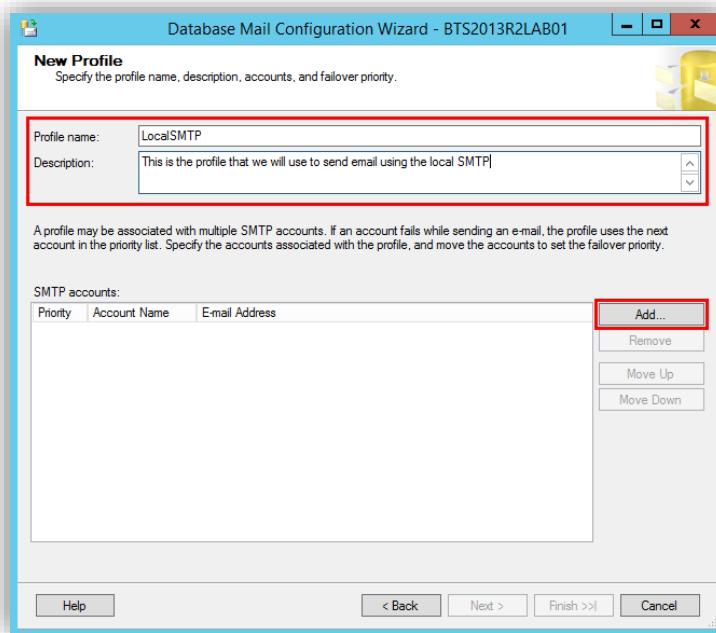
- On the Select Configuration Task page, select “Set up Database Mail by performing the following tasks:” and click “Next” to continue.
  - Set up Database Mail by performing the following tasks:** Perform all of the tasks required to set up Database Mail for the first time. This option includes all 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.

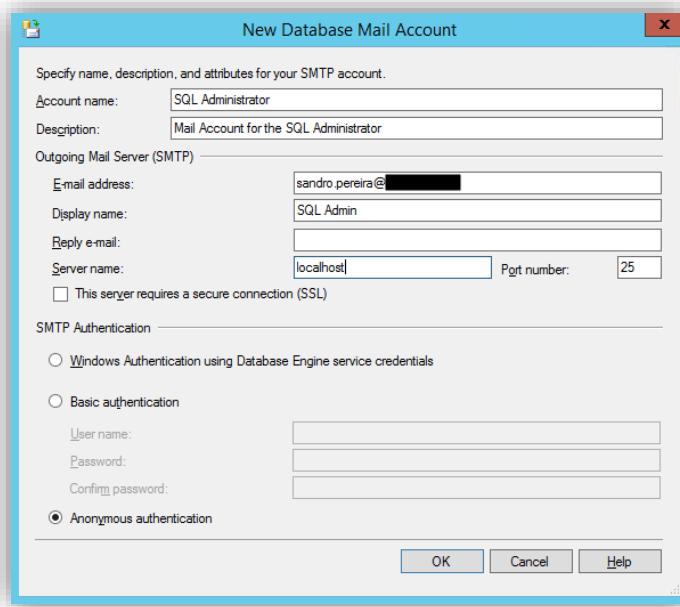


- On the New Profile page, specify the “Profile name” and “Description” to be included in the profile, and click “Add...” to specify an account

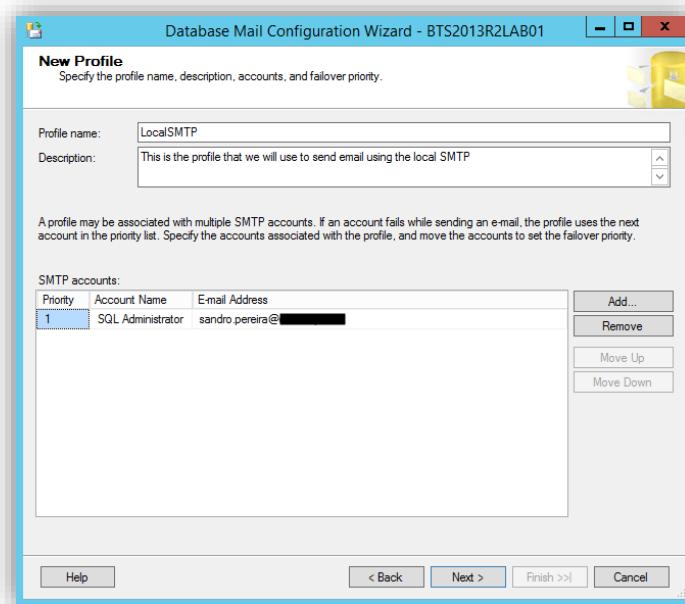


- On the New Database Mail Account page, specify the account name, description, mail server information, and authentication type. Click “OK”
  - A Database Mail account contains the information that SQL Server uses to send e-mail messages to an SMTP server. Each account contains information for one e-mail 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"

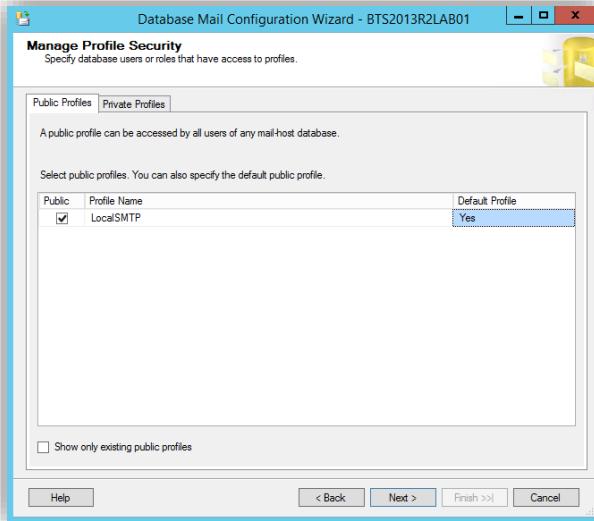
- **Port number:** Type the port number of the SMTP server for this account. Most SMTP servers use port 25.
- **This server requires a secure connection (SSL):** Encrypts communication using Secure Sockets Layer.
- **Windows Authentication using Database Engine service credentials:** Connection is made 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.



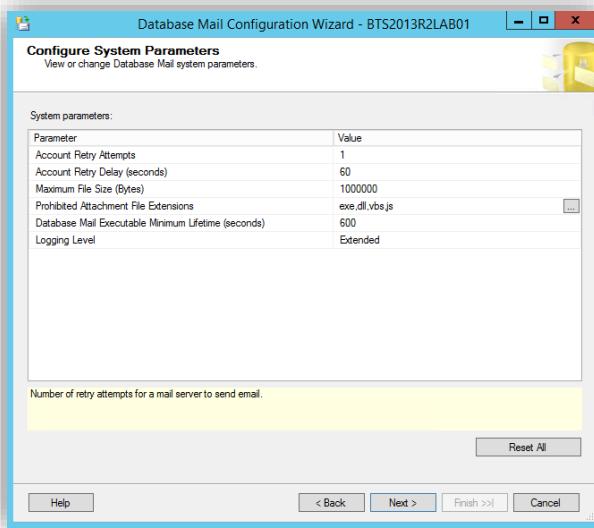
- Back on the New Profile page, click “Next” to continue



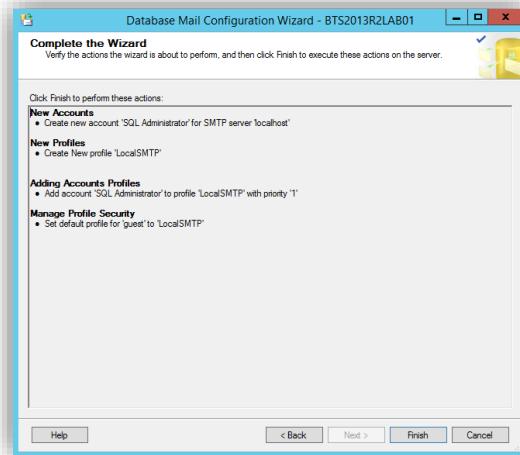
- On the Manage Profile Security page, you will be able to set the Public, Private and Default Profiles, select our profile as public and default and click “Next”.



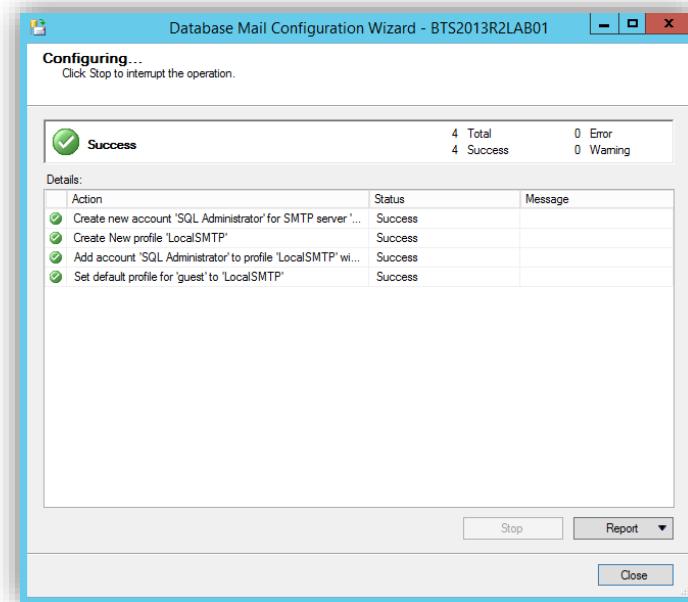
- On the Configure System Parameters page, leave the default values and click “Next”



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

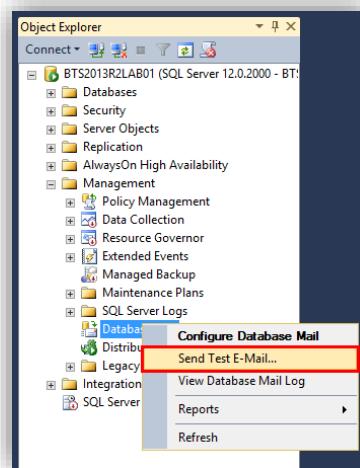


- On the “Configuring...” page, ensure that all actions succeed and then click “Close”

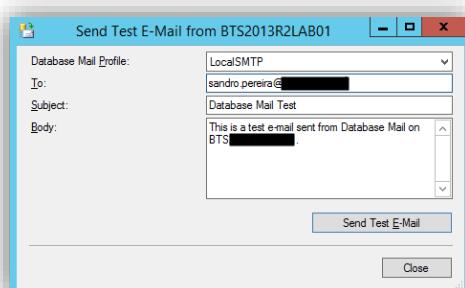


The Database Mail should now be configured successfully and all should be correctly setup to send emails, but we must make sure by testing it. So we will send a test email and confirm the reception. To do that:

- 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.

## Install Service Pack 1 for Microsoft SQL Server 2014

Until this date only the Service Pack 1 for Microsoft SQL Server 2014 is available and can be found [here](#). Service packs and Windows Updates are supported and should be installed.

Microsoft SQL Server 2014 SP1 contains the Microsoft SQL Server 2014 Service Pack 1 update to be applied to existing SQL Server 2014 installations. You can use these packages to upgrade any of the following SQL Server 2008 R2 editions:

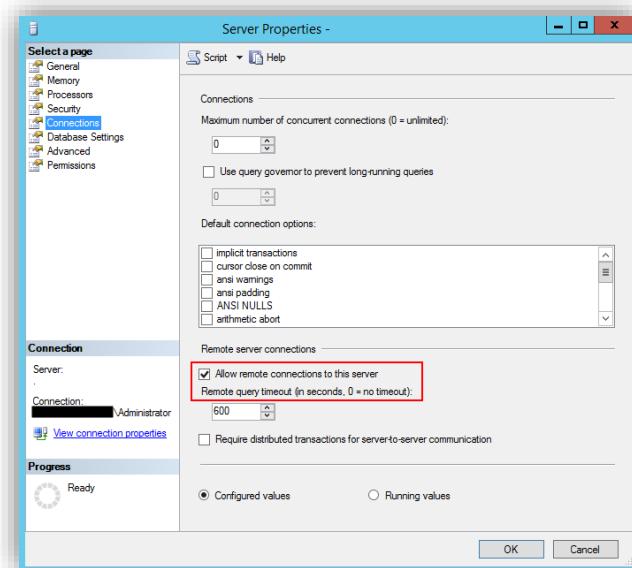
- Microsoft SQL Server 2014 Enterprise
- Microsoft SQL Server 2014 Developer
- Microsoft SQL Server 2014 Standard
- Microsoft SQL Server 2014 Business Intelligence
- Microsoft SQL Server 2014 Web
- Microsoft SQL Server 2014 Express

## Configure SQL Server for Remote Connections.

In order for the BizTalk servers to connect to SQL Server, remote connections need to be enabled.

To do so you need to:

- Run Microsoft SQL Server 2014 Management Studio and connect to the right instance.
- Once the tool opens, right click over instance name and select “Properties”
- Go to “Connections” page and select the option “Allow remote connections to this server”

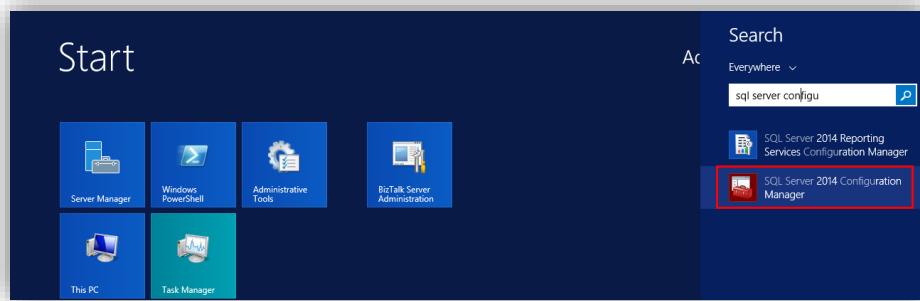


## Configured SQL Server protocols - Disable the Shared Memory Protocol, Enable TCP/IP and Named Pipes

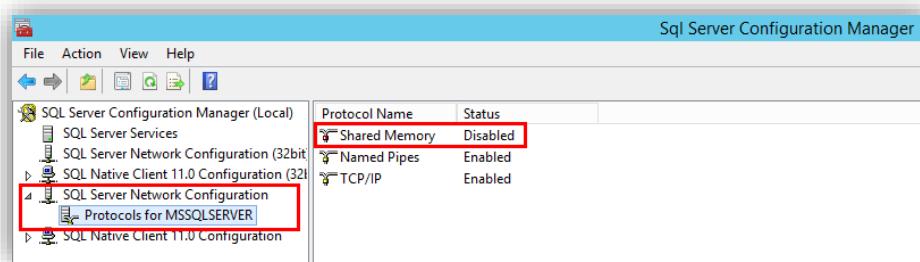
Under certain stress conditions (such as clients accessing SQL Server from the same computer), the SQL Server Shared Memory protocol may lower BizTalk Server performance. You can resolve this problem by disabling the use of the Shared Memory network protocol in SQL Server Network Configuration. Also, 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:

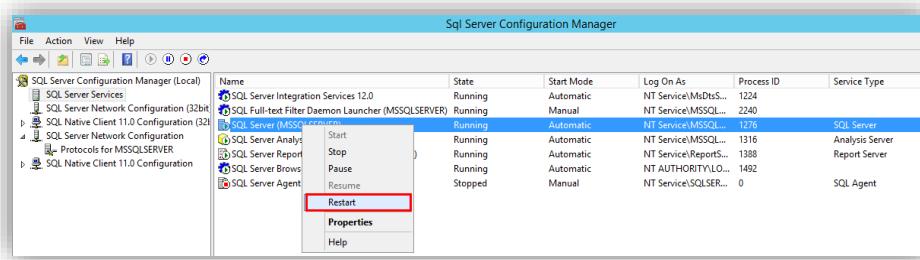
- Press the “Windows key” to switch to the Start screen, type “SQL Server Configuration Manager” and click in “SQL Server Configuration Manager” option from the Search menu.



- 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 Disable.
    - 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.

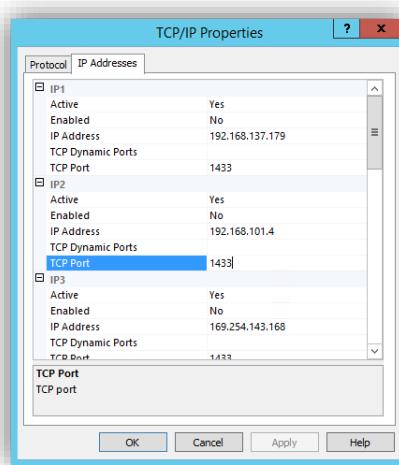
## Configure SQL Server Database Engine to listen on a specific TCP Port (optional)

This step is not mandatory and most of the time the default configuration don't need to be modified but sometimes, from a security perspective, the client doesn't want to use the default ports of the SQL Server.

If enabled, the default instance of the SQL Server Database Engine listens on TCP port 1433. Named instances of the Database Engine and SQL Server Compact are configured for dynamic ports. This means they select an available port when the SQL Server service is started. When you are connecting to a named instance through a firewall, configure the Database Engine to listen on a specific port, so that the appropriate port can be opened in the firewall.

To assign a TCP/IP port number to the SQL Server Database Engine:

- In SQL Server Configuration Manager, in the console pane, expand SQL Server Network Configuration, expand Protocols for <instance name>, and then double-click TCP/IP.
- In the “TCP/IP Properties” dialog box, on the “IP Addresses” tab, several IP addresses appear in the format IP1, IP2, up to IPAll.
  - One of these is for the IP address of the loopback adapter, 127.0.0.1. Additional IP addresses appear for each IP Address on the computer. Right-click each address, and then click Properties to identify the IP address that you want to configure.
- If the TCP Dynamic Ports dialog box contains 0, indicating the Database Engine is listening on dynamic ports, delete the 0.
- If the TCP Dynamic Ports dialog box contains 0, indicating the Database Engine is listening on dynamic ports, delete the 0.



- In the console pane, click SQL Server Services.
- In the details pane, right-click SQL Server (<instance name>) and then click Restart, to stop and restart SQL Server.

After you have configured SQL Server to listen on a specific port, there are three ways to connect to a specific port with a client application:

- Run the SQL Server Browser service on the server to connect to the Database Engine instance by name.
- Create an alias on the client, specifying the port number.
- Program the client to connect using a custom connection string.

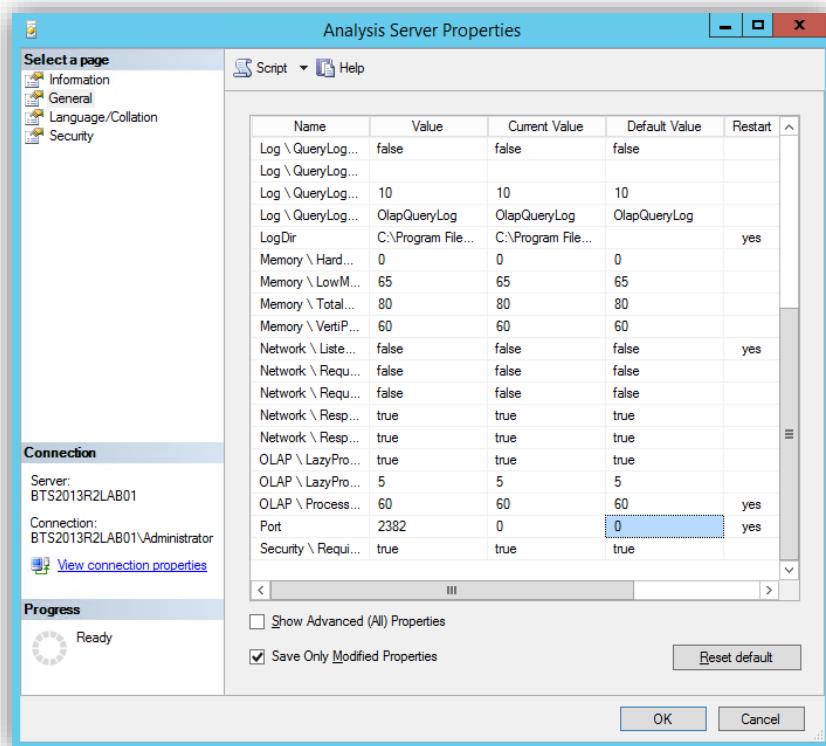
Reference: [How to: Configure a Server to Listen on a Specific TCP Port \(SQL Server Configuration Manager\)](#)

## Configure SQL Analysis Server to listen on a specific TCP Port (optional)

This step is not mandatory and most of the time the default configuration don't need to be modified but sometimes, from a security perspective, the client doesn't want to use the default ports of the SQL Server.

You will be able to configure the port that SQL Analysis Server is listening by:

- Opening the SQL Server Management Console and connect to Analysis Server
- Right Click on SQL instance and select "Properties" option
- On "General" tab, go to "Port" and set the port that you want to configure, in my case "2382".



- Click "Ok" and restart the service.

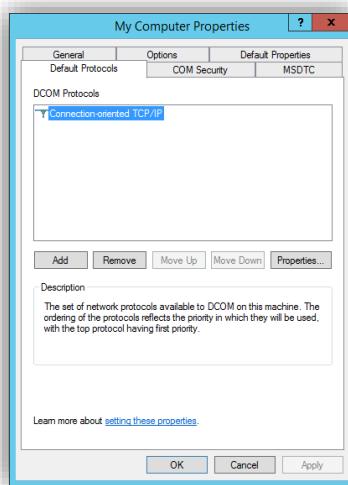
## Configuring Microsoft Distributed Transaction Coordinator (DTC) to work through a firewall or network address translation firewalls (optional)

DTC uses Remote Procedure Call (RPC) dynamic port allocation. By default, RPC dynamic port allocation randomly selects port numbers above 1024.

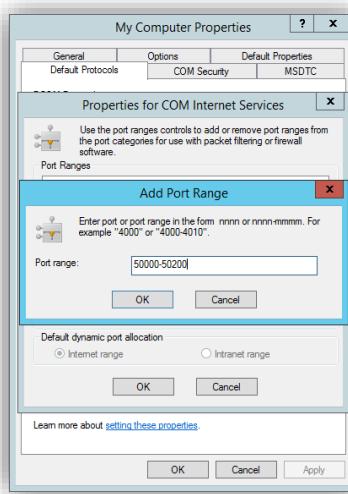
You can configure DTC to communicate through firewalls, including network address translation firewalls, just follow these steps:

- Press the "Windows key" to switch to the Start screen.
- Type "dcomcnfg" and click in "dcomcnfg" option from the Search menu.
- On Component Services console, expand "Component Services"
- Right click over "My Computer" and select "Properties" option

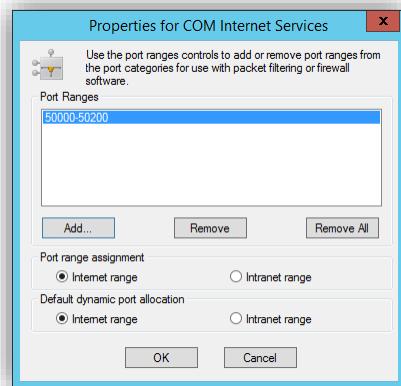
- Go to “Default Protocols” tab select “Connection-oriented TCP/IP” option in DCOM protocols



- Click “Properties” button
- On “Properties for COM Internet Services” windows, click “Add” button to set a port range
- Specify the range of ports you want to use, I set the following range: “**50000-50200**”



- Click “Ok”



- Ensure that “Internet range” is check in both options: “Port range assignment” and “Default dynamic port allocation”

## List of ports between BizTalk Server and SQL Server (optional)

The following table lists the ports that we need to configured in firewall or request ACLs to network IT.

Direction:

- Source Host: BizTalk Server
- Destination Host: SQL Server

Port No	Protocol /Service	Description of Service
135	TCP	RPC: Transacted connection to SQL Server  Transacted connection to SQL Server for SQL adapter
50000-50200  (you may extend more ports for performance)	TCP	Secondary RPC ports  Secondary RPC ports for SQL adapter  Secondary RPC ports used to retrieve the secret key from the master secret server.
1433	TCP	Microsoft SQL Server port used typically for remote connections to the database.  For the Enterprise Single Sign-On service to connect to the SSO database  To create and configure the databases: BizTalk Management database, MessageBox database, ...  To access BAM Notification Services database  To update and retrieve information from the databases during run time operations  Retrieve and send messages from databases used by SQL adapter
1434	UDP	Microsoft SQL Monitor use in monitoring Microsoft SQL Databases.
2382	TCP	To update and retrieve information from the BAM Analysis database
445	TCP	To create the OLAP data file (.mdb) on the remote computer
2725	TCP	To create and configure the database, and to retrieve data for analysis (PivotTable reports)
80 or 443	TCP	For inbound traffic for the Web Site

Reference:

- [Required Ports for BizTalk Server](#)

## Configure Firewall on SQL Server machine (optional)

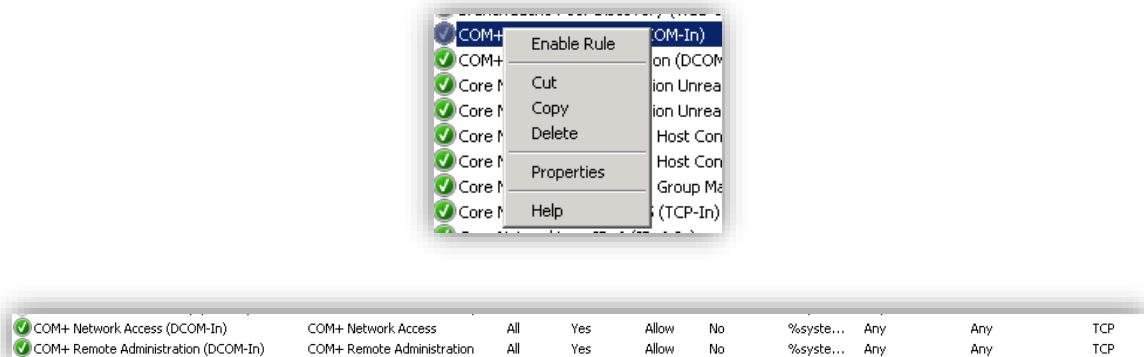
To access an instance of the SQL Server through a firewall, you must configure the firewall on the computer that is running SQL Server to allow access. The firewall is a component of Microsoft Windows. You can also install a firewall from another company. This topic discusses how to configure the Windows firewall, but the basic principles apply to other firewall programs

See more information here: [Configure the Windows Firewall to Allow SQL Server Access](#)

### Inbound Rules

In order to make DCOM applications work in Windows Server 2012 R2 you need to add the COM+ network access as show below:

- Open “Server manager” console and expand “Configuration” option in the left tree.
- Expand “Windows Firewall with Advanced Security” and select “Inbound Rules” option.
- Enable the following inbound rules by select them and right click and select the option “Enable Rule” option
  - COM+ Network Access (DCOM-in)
  - COM+ Remote Administrator (DCOM-In)



Also we enable Microsoft Distributed Transaction Coordinator (MS DTC) to communicate through a firewall with another MS DTC.

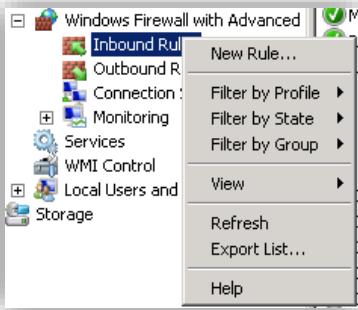
Repeat the previous steps and Enable the followings rules:

- Distributed Transaction Coordinator (RPC)
- Distributed Transaction Coordinator (RPC-EPMAP)
- Distributed Transaction Coordinator (TCP-In)

<input checked="" type="checkbox"/>	Distributed Transaction Coordinator (RPC)	Distributed Transaction Coordinator (RPC)	All	Yes	Allow	No	%system%	Any	Any	TCP
<input checked="" type="checkbox"/>	Distributed Transaction Coordinator (RPC-EPMAP)	Distributed Transaction Coordinator (RPC-EPMAP)	All	Yes	Allow	No	%system%	Any	Any	TCP
<input checked="" type="checkbox"/>	Distributed Transaction Coordinator (TCP-In)	Distributed Transaction Coordinator (TCP-In)	All	Yes	Allow	No	%system%	Any	Any	TCP

Now we need to create new rules for each of port described in topic “[List of ports between BizTalk Server and SQL Server](#)” to allow BizTalk Server to communicate with SQL Server machine. To create a new Inbound Rule, follow these steps:

- Right click on “Inbound Rules” on the left tree and select the option “New Rule”



- On "New Inbound Rule Wizard" windows in step "Rule Type" select "Port" option
- in step "Protocol and Ports" select the protocol requested and specify the port or list of ports
- in step "Action" select "Allow the connection" option
- in step "Profile" leave the default options
- in step "name" set the name and description of the rule

## Outbound Rules

First thing is to enable the following outbound rules:

- Distributed Transaction Coordinator (TCP-Out) – this will allow Outbound traffic for the Distributed Transaction Coordinator.

Name	Action	Profile	Local Address	Remote Address	Protocol
Distributed Transaction Coordinator (TCP-Out)	Allow	All	%System% Any	Any	TCP Any

To do this follow the steps described in Inbound Rules, the steps are the same the only difference is that we are dealing with Outbound Rules

The second is to create a new outbound rule for RPC ports:

- Right click on "Outbound Rules" on the left tree and select the option "New Rule"
- On "New Inbound Rule Wizard" windows in step "Rule Type" select "Port" option
- In step "Protocol and Ports"
  - Select the protocol: TCP
  - Specify the range of ports: 50000-50200
- In step "Action" select "Allow the connection" option
- In step "Profile" leave the default options
- In step "name" set the name and description of the rule

Name	Group	Profile	Enabled	Action	Program	Local Address	Remote Address	Protocol
Secondary RPC ports		All	Yes	Allow	Any	Any	Any	TCP

## Preparing and install prerequisites on BizTalk Server 2013 R2 machine

This part of the article will focus on installing the BizTalk prerequisites and operate 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 servers

Check if all the considerations described above are implemented:

- Change the machine name
- Join the BizTalk Administrator Group to Local Administrators Group
- Install Critical Windows Updates
- Disable IPv6 (optional)
- Turn off Internet Explorer Enhanced Security Configuration (optional)
- Disable User Account Control (optional)
- Turn Windows Firewall off (optional)
- Configure Microsoft Distributed Transaction Coordinator (MS DTC)
- Enable Network COM+ access

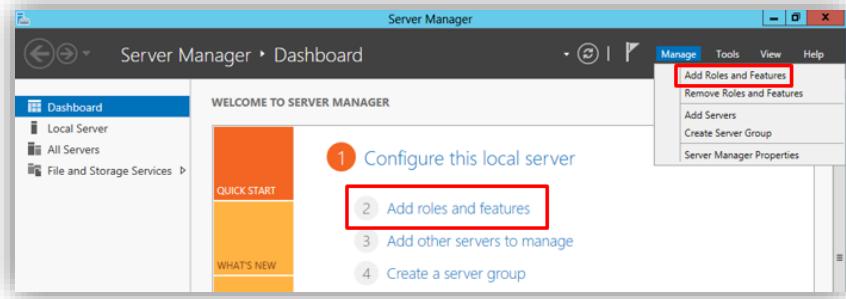
### Enable Internet Information Services

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

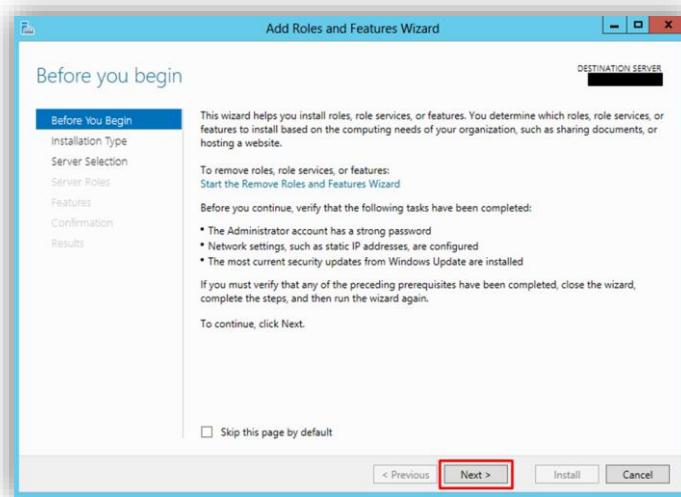
- HTTP adapter
- SOAP adapter
- Windows SharePoint Services adapter
- Secure Sockets Layer (SSL) encryption
- BAM Portal
- EDI
- UDDI

To install IIS 8.5, use the following steps:

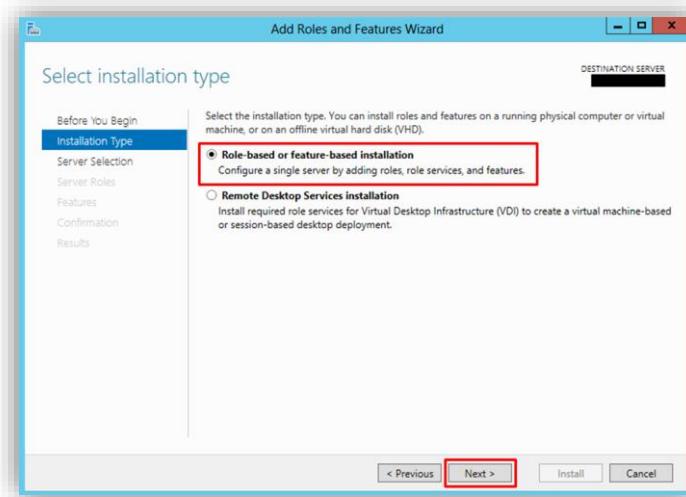
- Start by running the “Server Manager”, if it is not already open, from either:
  - On the Windows taskbar, click the Server Manager button
  - On the Start screen, click Server Manager.
- Under “Manage” menu, select “Add Roles and Features” (or press “Add roles and features” under the Dashboard panel)



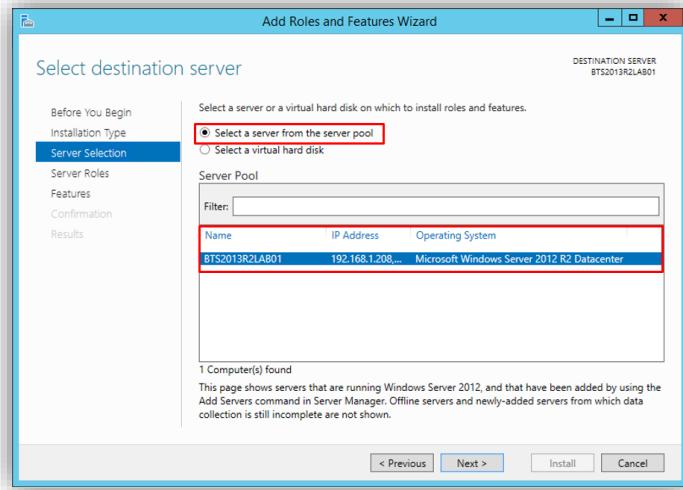
- On the Before You Begin screen, click “Next”



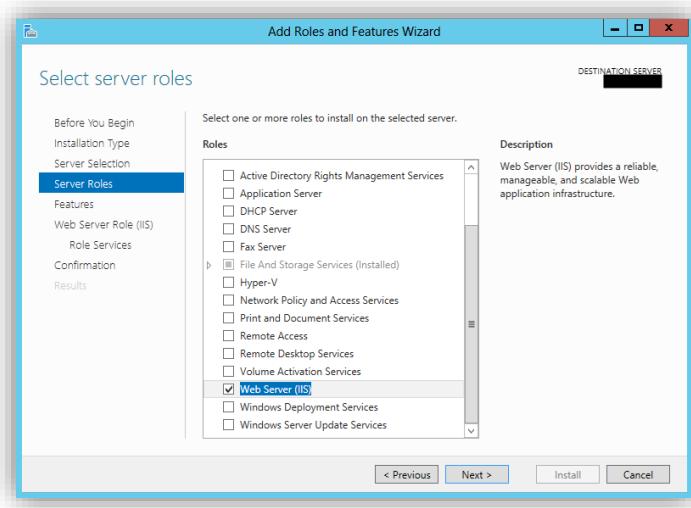
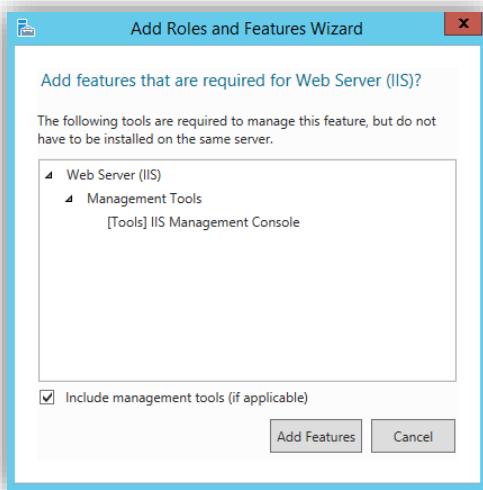
- On the Installation Type screen, select “Role-based or feature-based installation” and click “Next”



- 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

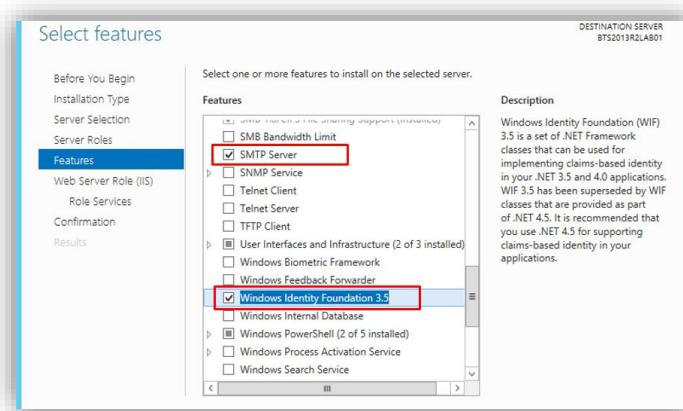
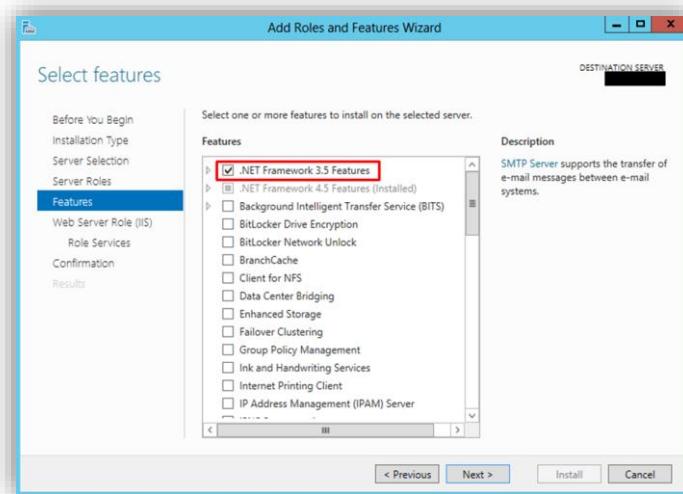


- On the Server Roles screen, select “Web Server (IIS)” option
  - If prompted, click "Add Features", and then click “Next”



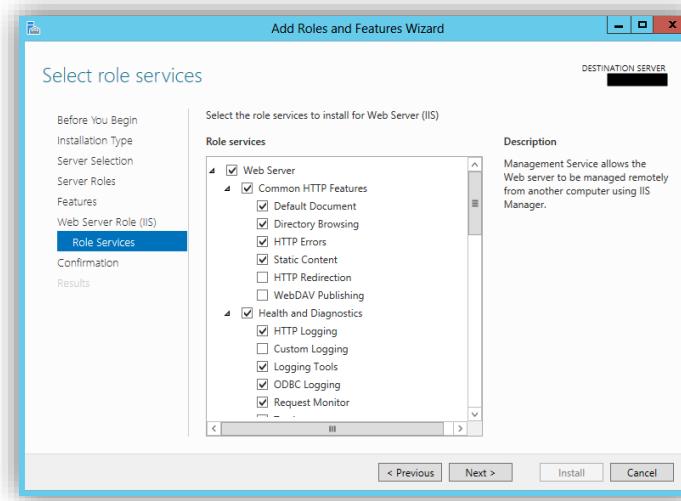
- On the Features screen, no additional features are needed for IIS, however, in addition to the default values, we will need or should select the following options:

- .Net Framework 3.5 Features
- 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).

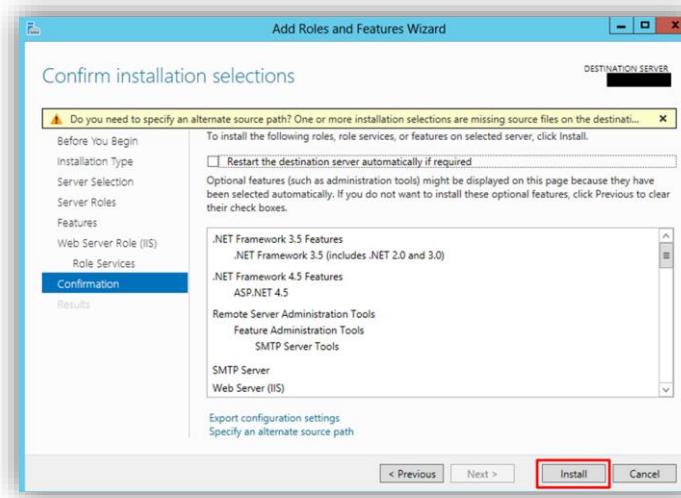


- Then click “Next”
- On the Web Server Role (IIS) screen, click “Next”
- On the Role Services screen under Web Server Role (IIS), we will customize our installation of IIS with the following options:
  - Common HTTP Features
    - Default Document
    - Directory Browsing
    - HTTP Errors
    - Static Content
  - Health and Diagnostics
    - Http Logging
    - Logging Tools
    - ODBC Logging
    - Request Monitor
    - Tracking
  - 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”

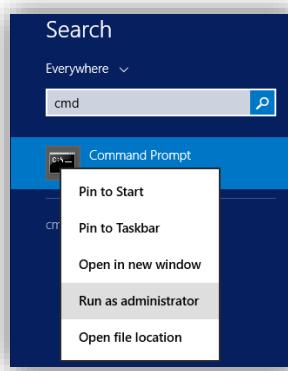


- When the IIS installation completes, the wizard reflects the installation status on the Results screen
- Click “Close” to exit the wizard.

### 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 switch to the Start screen and type “cmd” on the **Start Search** box, right-click in “Command Prompt” and select from the context menu the “Run as administrator” option.



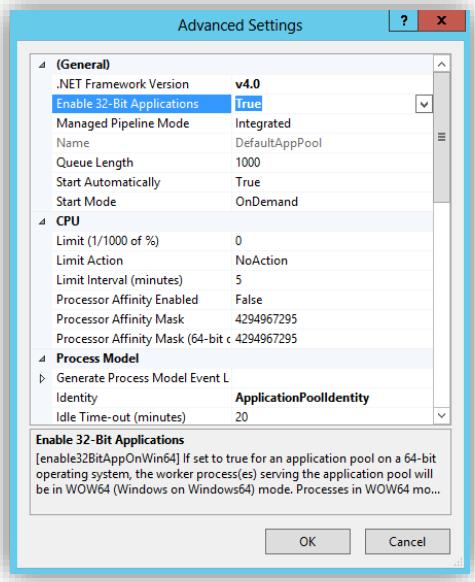
- Type the following at the command prompt:
  - `cscript c:\inetpub\adminscripts\adsutil.vbs SET W3SVC/AppPools/Enable32bitAppOnWin64 1`
- Close the command prompt.

Or:

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

Name	Status	.NET Fram...	Managed Pipe...	Identity	Applications
.NET v2.0	Started	v2.0	Integrated	ApplicationPoolId...	0
.NET v2.0 Classic	Started	v2.0	Classic	ApplicationPoolId...	0
.NET v4.5	Started	v4.0	Integrated	ApplicationPoolId...	0
.NET v4.5 Classic	Started	v4.0	Classic	ApplicationPoolId...	0
Classic .NET Ap...	Started	v2.0	Classic	ApplicationPoolId...	0
<b>DefaultAppPool</b>	Started	v4.0	Integrated	ApplicationPoolId...	1

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



## Install Windows Identity Foundation (WIF) (optional)

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:

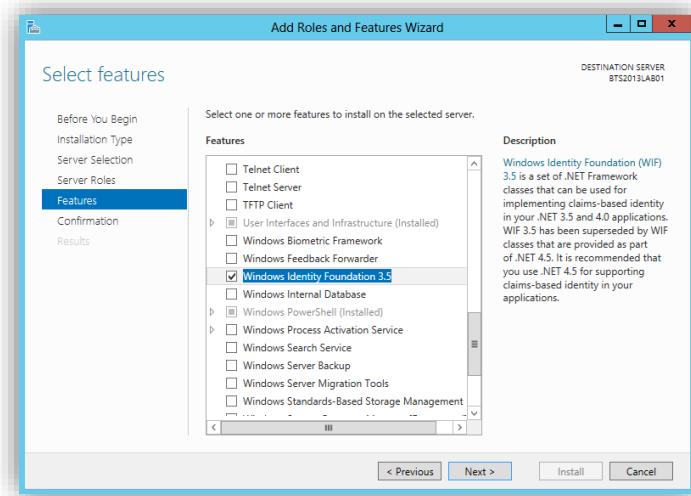
- SharePoint Services Adapter Web Service (deprecated)
- No plan to use SharePoint

Windows Identity Foundation is included with the operating system (Windows Server 2012 R2, 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](#)):

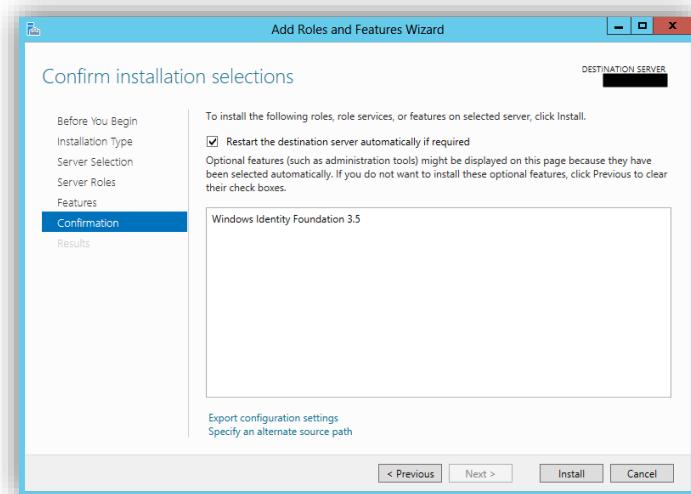
If you didn't previous install WIF then you should following this steps:

- Start by running the “Server Manager”, if it is not already open, from either:
  - On the Windows taskbar, click the Server Manager button
  - On the Start screen, click Server Manager.
- 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 Microsoft Office Excel 2013 (optional)

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.

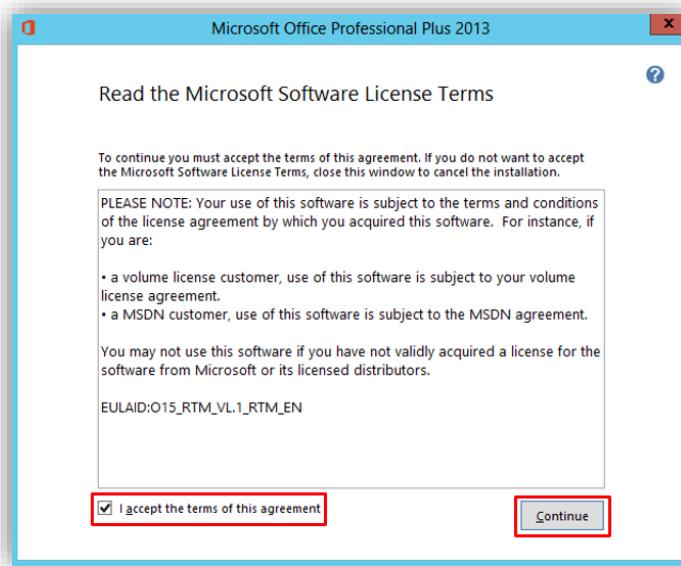
**IMPORTANT NOTE:** BizTalk Server 2013 R2 supports only 32-bit version of Microsoft Office.

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.

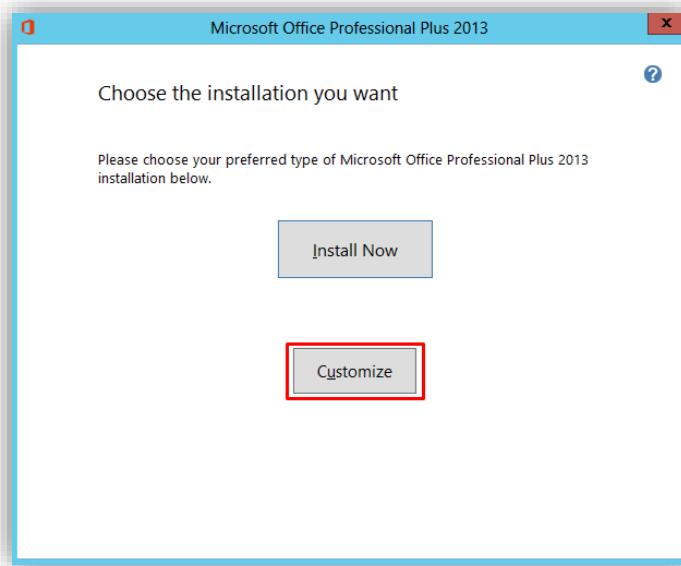
**IMPORTANT NOTE:** To successfully load BAM.xla into Excel, you will need to install the “**VISUAL BASIC FOR APPLICATIONS**” option under “**OFFICE SHARED FEATURES**”. Otherwise, you may get the error “This workbook has lost its VBA project, ActiveX controls and any other programmability-related features.”

To install Microsoft Office Excel:

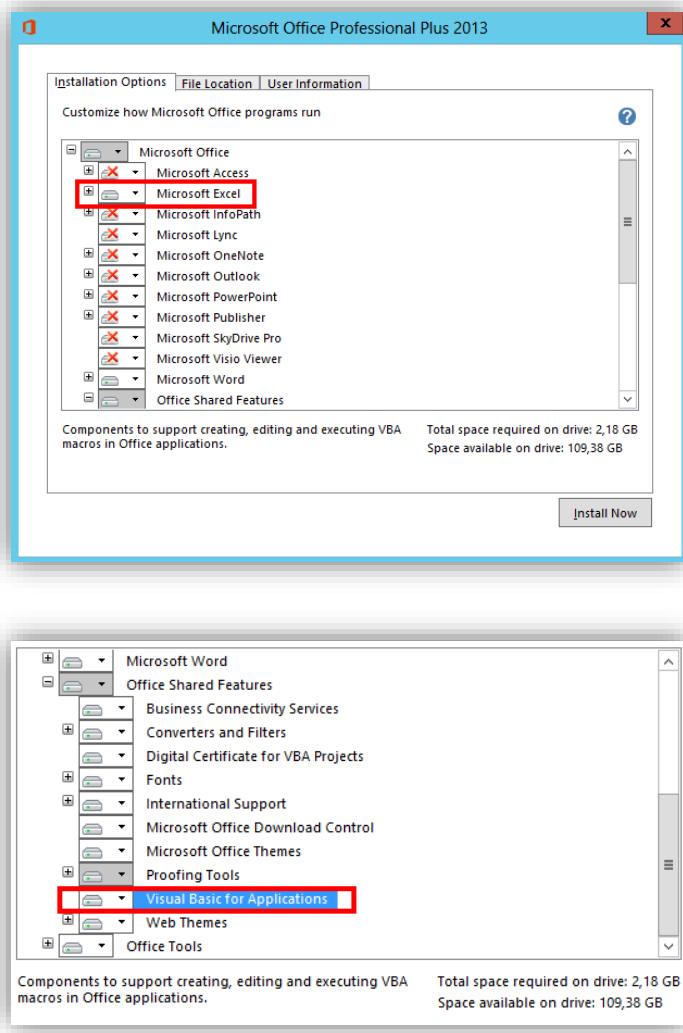
- Insert the Microsoft Office installation disk into the DVD-ROM drive.
- On Read the Microsoft Software License Terms screen, select “I accept the terms of this agreement” and click “Continue”



- On the Type of Installation screen, select Custom Install, and then click “Next”.



- On the Custom Setup screen, ensure that:
  - Microsoft Excel option is selected.
  - And “Visual Basic for Applications” option under Office Shared Features is select.



- And then click “Install Now”.
- On the Setup Completed screen, click “Finish”.
- After installing the office Excel and tools I like to do a Windows update, this step is not necessary.

## Install Visual Studio 2013 (optional)

The BizTalk Server development tools are based on Visual Studio and it provides a development environment for building BizTalk Server applications. **Ultimate Edition is recommended, but Premium and Professional 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 2013 you cannot customize the features that you want to install to the point of only install Visual C#, at least that I know of.

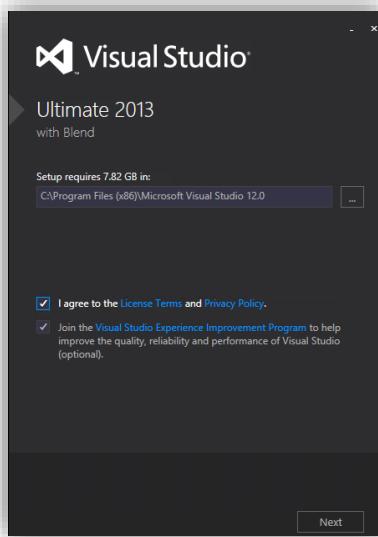
**NOTE:** Visual Studio 2013 is not required if you are installing BizTalk Server on a production environment (runtime only), on which it is not required to do application development and/or application debugging.

**IMPORTANT NOTE:** The BizTalk Server runtime components require .NET Framework 4.5. In addition, the .NET Framework 3.0 is required if the Windows Communication Foundation (WCF) adapter or WCF Interceptor are planned to be installed.

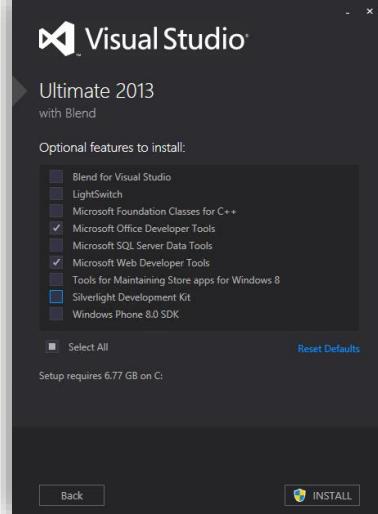
**ADDITIONAL NOTE:** If you install Visual Studio before installing BizTalk Server, and then upgrade to Visual Studio Team Explorer, you may need to repair your BizTalk Server installation from the Control Panel / Programs option.

To install Visual Studio 2013:

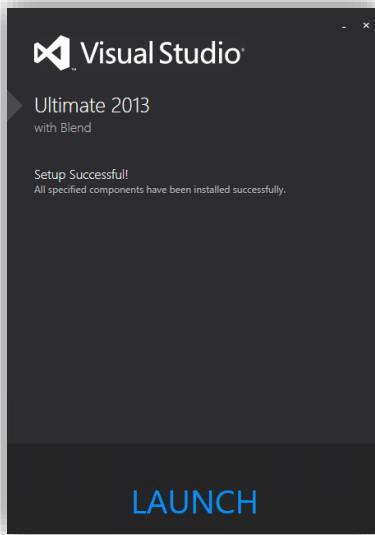
- Insert the Visual Studio 2013 installation disk into the DVD-ROM drive.
- On the Start page, accept the license agreement by selecting “I agree to the License terms and conditions” and then click “Next”.



- In **Optional features to install**, select the options you need and then select **Install**. BizTalk Server does not require any of the optional features. However I think that is important at least to install “Microsoft Web Developer Tools”. Add the following features to your installation:
  - Microsoft Web Developer Tools
  - Microsoft Office Developer Tools (not required)



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



**IMPORTANT NOTE:** Because we cannot customize the Visual Studio 2013 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.** As a best practice, uninstall Microsoft SQL Server Express or/and Compact.

### Remove Microsoft SQL Server Express

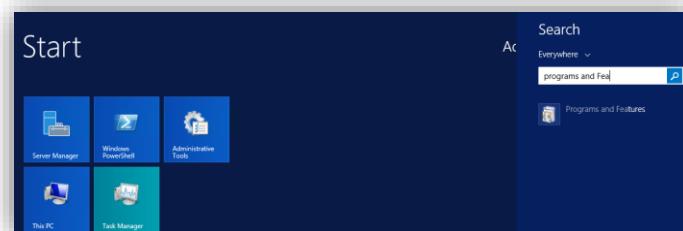
As I say previous your version of Visual Studio **WILL INCLUDE MICROSOFT SQL SERVER EXPRESS OR COMPACT AS** an optional feature that will be automatically installed. This feature it may cause BizTalk Server setup to fail and should not be installed but as we cannot customize the Visual Studio 2013 installation, so it's very important that we remove this features.

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

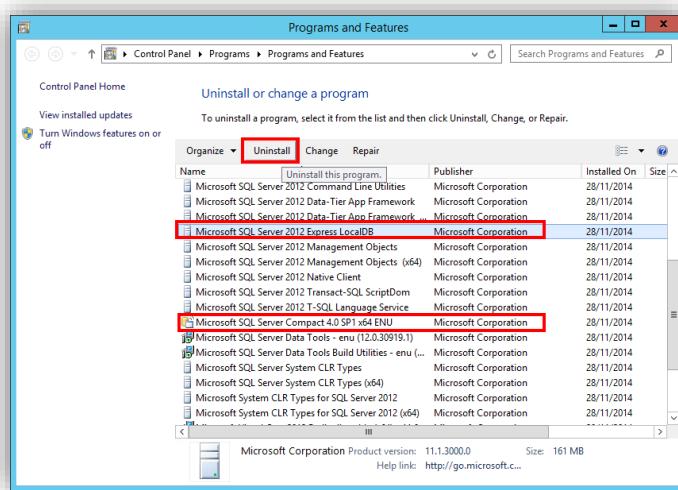
- Microsoft SQL Server 2012 Express LocalBd
- Microsoft SQL Server Compact 4.0 SP1 x4 ENU: Microsoft SQL Server Compact 4.0 is a free, embedded database that software developers can use for building ASP.NET websites and Windows desktop applications. SQL Server Compact 4.0 has a small footprint and supports 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 this features:

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



- Select “Microsoft SQL Server 2012 Express LocalDb” and click “Uninstall”.



- Repeat the process, select “Microsoft SQL Server Compact 4.0 SP1 x4 ENU” and click “Uninstall”.

## SQL Server Considerations

The following conditions apply regarding remote computers.

- SQL Server Client Tools Connectivity must be installed on the local BizTalk Server computer when SQL Server is remote. The SQL Server Client Tools Connectivity installs the client libraries required to communicate with the remote instance of SQL Server.
- The version of the SQL Server Client Connectivity tools on the local BizTalk Server computer must be the same version that is installed on the remote SQL Server.
- The remote SQL Server must be running during BizTalk Server configuration.
- The TCP and UDP ports you specified during the SQL Server setup process must be open during BizTalk Server configuration.
- SQL Server OLAP client must be installed on the local computer if you plan to use Analysis Services remotely.
- To configure BAM tools, install “SQL Server Management Tools - Basic and Complete” on the BizTalk BAM Server.
- Named instances of SQL Server 2008 Analysis Services are not supported.

You can configure BAM Primary Import, BAM Archive, BAM Star Schema, BAM Analysis, and BAM Notification Services Application databases on different computers. The following are the software requirements when SQL Server is installed on a computer other than the BizTalk Server:

BAM feature	Feature configuration	BizTalk Server	SQL Server
BAM Tools	BAM Primary Import Tables and BAM Archive database	ADOMD.NET SQL Server Integration Services	SQL Server 2008 R2 or SQL Server 2012
BAM Tools	Enable Analysis Services for BAM aggregations	SQL Server Integration Services	SQL Server 2008 R2 Analysis Services or SQL Server 2012 Analysis Services
BAM Notification Services	Enable Notification Services for BAM alerts	If using SQL Server 2008 R2, install SQL Server 2005	If using SQL Server 2012, configure SQL Server Database

Application Database	<p>Notification Services Engine Components.</p> <p>The BAM Alerts requirements are documented at <a href="#">Preparing Your Computer for Installation</a>.</p>	<p>Mail.</p> <p>The BAM Alerts requirements are documented at <a href="#">Preparing Your Computer for Installation</a>.</p>
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**NOTE:** The service account used for the OLAP service should have **db\_datareader** permissions on the BAM Star Schema database

See more information here: [Install BizTalk Server in a Multi-Computer Environment](#)

## Install SQL Server 2014 Client Tools

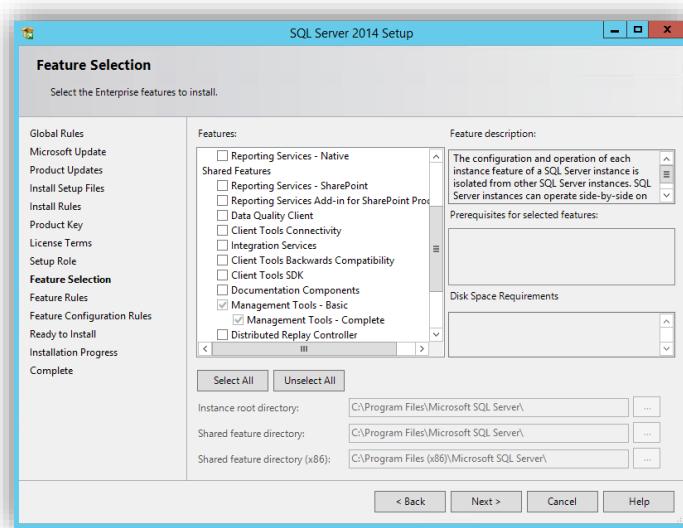
SQL Server Client Tools must be installed on the local computer when SQL Server is remote.

The SQL Server Client Tools (must be the same version that is installed on the remote SQL Server) install the client libraries required to communicate with the remote instance of SQL Server.

To Install SQL Server 2014 Client Tools:

- Insert the SQL Server 2014 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”
- 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 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 check fails, the setup application will provide the corrective measures to take so installation may proceed. Click on “Next” to continue.
- On the Setup Role page, select “SQL Server Feature Installation”, and then click “Next” to continue to the Feature Selection page.
- On the Feature Selection page, select the following features, and then click “Next”
  - Shared Features
    - Management Tools – Basic

- Management Tools – Complete



- 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 Feature Configuration Rules page, this 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”

## Create SQL Alias to communicate with remote SQL Server using Non-Standard Port (optional)

When we want to install BizTalk Server with a remote SQL Server using non default port we cannot use “servername\instance, port number” for BizTalk installation, it will give you the following error:

- Error Configuration Framework]Feature: [Group] Failed to configure with error message [Exception of type 'System.EnterpriseServices.TransactionProxyException' was thrown.]

Instead you should create a SQL Server Alias on the client machine to connect to SQL Server machine.

An alias can be created on the client machine by running the SQL Server Configuration Manager tool.

- Under the SQL Server Native Client folder, right click on the “Aliases” item and select the “New Aliases” item.
- When doing this the “Alias – New” dialog box will be displayed. In the new alias dialog box, you can create an alias where you can specify the instance name and the port number it is using.
  - In the “Alias Name” set the name of alias: “BizTalkSQL”
  - In “Port No” specify the port where Database Engine running is listening: 1433
  - In “Protocol” leave the default value “TCP/IP”
  - In “Server” specify “servername\instance”

## List of ports between SQL Server and BizTalk Server (optional)

The following table lists the ports that we need to configured in firewall or request ACLs to network IT.

Direction:

- Source Host: SQL Server
- Destination Host: BizTalk Server

Port No	Protocol /Service	Description of Service
135	TCP	RPC: Transacted connection to SQL Server Transacted connection to SQL Server for SQL adapter
50000-50200 (you may extend more ports for performance)	TCP	Secondary RPC ports Secondary RPC ports for SQL adapter

Reference:

- [Required Ports for BizTalk Server](#)

## Configure Firewall on BizTalk Server machine (optional)

### Inbound Rules

In order to make DCOM applications work in Windows Server 2012 R2 you need to add the COM+ network access as show below:

- As described previously on “Configure Firewall on SQL Server machine”. Enable the following inbound rules by select them and right click and select the option “Enable Rule” option
  - COM+ Network Access (DCOM-In)
  - COM+ Remote Administrator (DCOM-In)
- Also enable Microsoft Distributed Transaction Coordinator (MS DTC) to communicate through a firewall with another MS DTC.
  - Distributed Transaction Coordinator (RPC)
  - Distributed Transaction Coordinator (RPC-EPMAP)
  - Distributed Transaction Coordinator (TCP-In)

Now we need to create new rules for each of port described in topic “[List of ports between SQL Server and BizTalk Server](#)” to allow SQL Server to communicate with BizTalk Server machine. As described previously on “Configure Firewall on SQL Server machine”

<input checked="" type="checkbox"/> RPC: Transacted connection to SQL Server <input checked="" type="checkbox"/> Secondary RPC ports	All	Yes	Allow	No	Any	Any	Any	TCP
---	-----	-----	-------	----	-----	-----	-----	-----

### Outbound Rules

First thing is to enable the following outbound rules:

- Distributed Transaction Coordinator (TCP-Out) – this will allow Outbound traffic for the Distributed Transaction Coordinator.

The second is to create a new outbound rule for RPC ports:

- Right click on “Outbound Rules” on the left tree and select the option “New Rule”
- On “New Inbound Rule Wizard” windows in step “Rule Type” select “Port” option
- In step “Protocol and Ports”
  - Select the protocol: TCP
  - Specify the range of ports: 50000-50200
- In step “Action” select “Allow the connection” option
- In step “Profile” leave the default options
- In step “name” set the name and description of the rule



## Testing environment connectivity's

Before you install and configure BizTalk Server is always a good practice to test or validate the connectivity's between BizTalk Server and SQL Server machines.

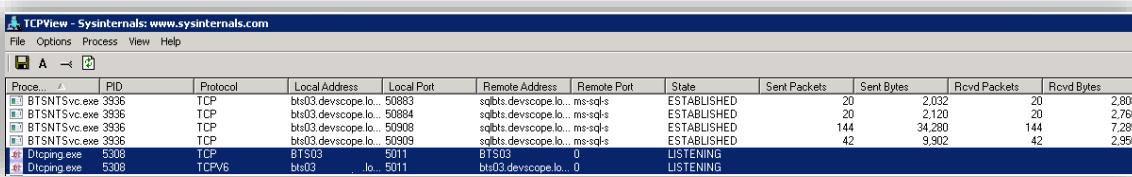
To accomplish that we can use 3 Tools:

- **TCPView** – This is a Windows program that will show you detailed listings of all TCP and UDP endpoints on your system and can be obtained from Microsoft: [TCPView](#)
- **DTCPing** - This tool is designed to assist with troubleshooting Microsoft DTC Firewall Issues and can be obtained from Microsoft: [DTCPing.exe](#)
- **DTCTester** – This tool tests a distributed transaction against a specified Microsoft SQL Server. This tool helps to test distributed transactions across firewalls or against networks. The tool performs distributed transactions by using ODBC API against a SQL Server database and can be obtained from Microsoft: [How To Use DTCTester Tool](#)
- SQL Server 2008 R2 Client Tools – Tools to communicate with the remote instance of SQL Server

## TCPView

Before running this tool and since this tool runs on dynamic port, we have to check which port this tool is listening on both machines and add an inbound rule in each firewall. To accomplish that, we can use the tool TCPView.

TCPView is a Windows program that will show you detailed listings of all TCP and UDP endpoints on your system, including the local and remote addresses and state of TCP connections.

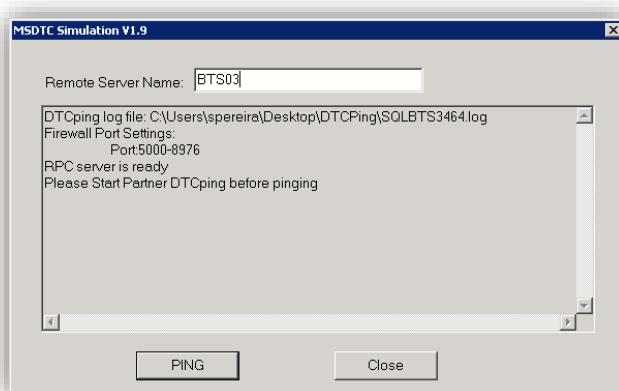


Process	/	PID	Protocol	Local Address	Local Port	Remote Address	Remote Port	State	Sent Packets	Sent Bytes	Rcvd Packets	Rcvd Bytes
BTNTSVC.exe		3536	TCP	bts03.devsco...	50883	sqlbts.devsco...	ms-sql-s	ESTABLISHED	20	2,032	20	2,808
BTNTSVC.exe		3536	TCP	bts03.devsco...	50894	sqlbts.devsco...	ms-sql-s	ESTABLISHED	20	2,120	20	2,766
BTNTSVC.exe		3536	TCP	bts03.devsco...	50908	sqlbts.devsco...	ms-sql-s	ESTABLISHED	144	34,280	144	7,285
BTNTSVC.exe		3536	TCP	bts03.devsco...	50909	sqlbts.devsco...	ms-sql-s	ESTABLISHED	42	9,902	42	2,950
Dtcping.exe		5308	TCP	BTS03	5011	BTS03	0	LISTENING				
Dtcping.exe		5308	TCPV6	bts03	lo_ 5011	bts03.devsco...	0	LISTENING				

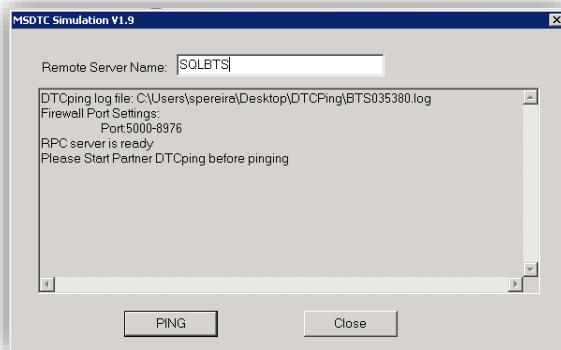
## DTCPing

To test DTCPing tool you must run this tool on both the machines, then you can test whether the normal RPC communication is working or not.

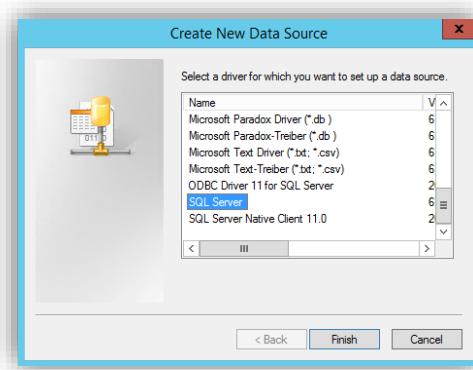
On SQL Server machine put the following configuration:



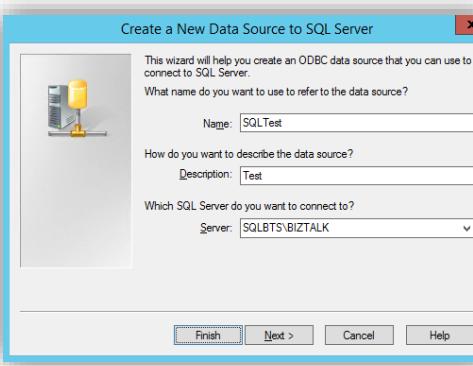
On BizTalk Server machine put the following configuration:



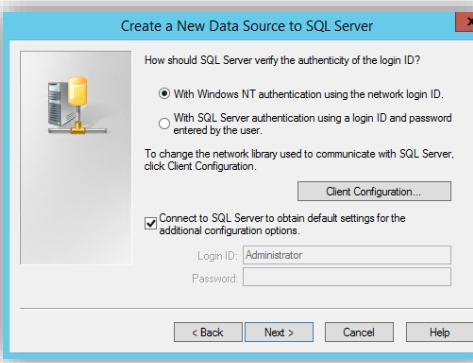
- Select “Add” button, select “SQL Server” option and click “Finish”



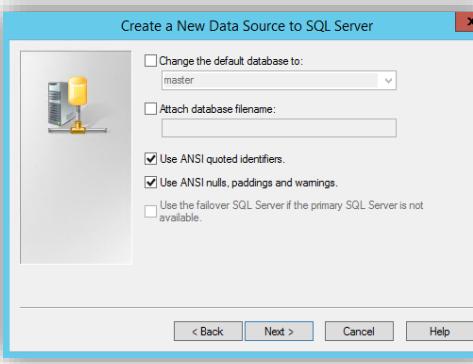
- Configure the New Data Source and then click “Next”



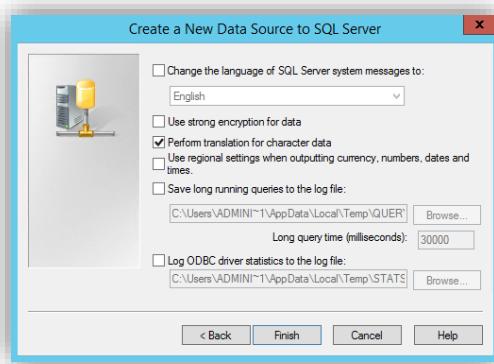
- Leave Default options and click “Next”



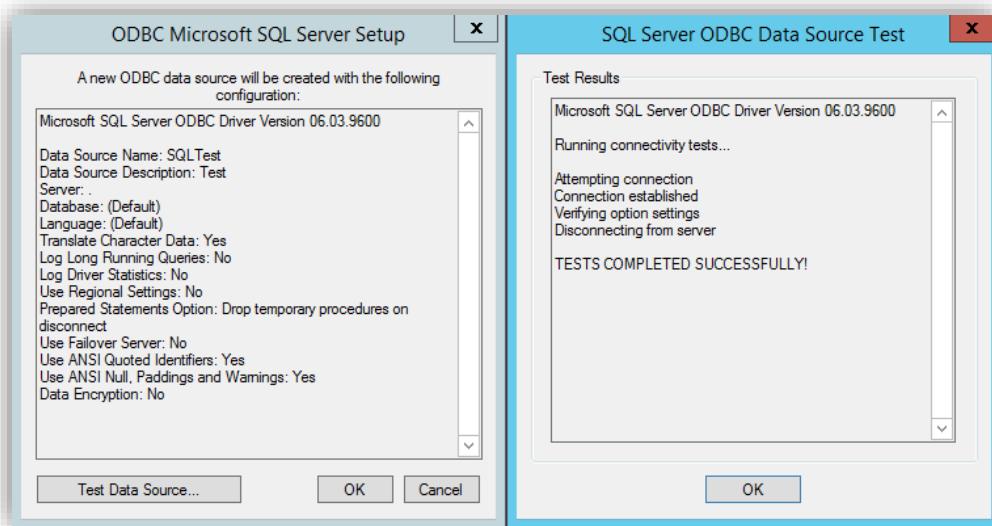
- Leave Default options and click “Next”



- Leave Default options and click “Finish”



- Test Data Source



- Press “Ok” and then “Ok”
- Access to command line (run → cmd) from BizTalk Server machine and run the following command:
  - Go to DTCTester directory
  - Type dtctester <odbc name> <user name> <password>
  - Example: dtctester SQLTest myuser mypass

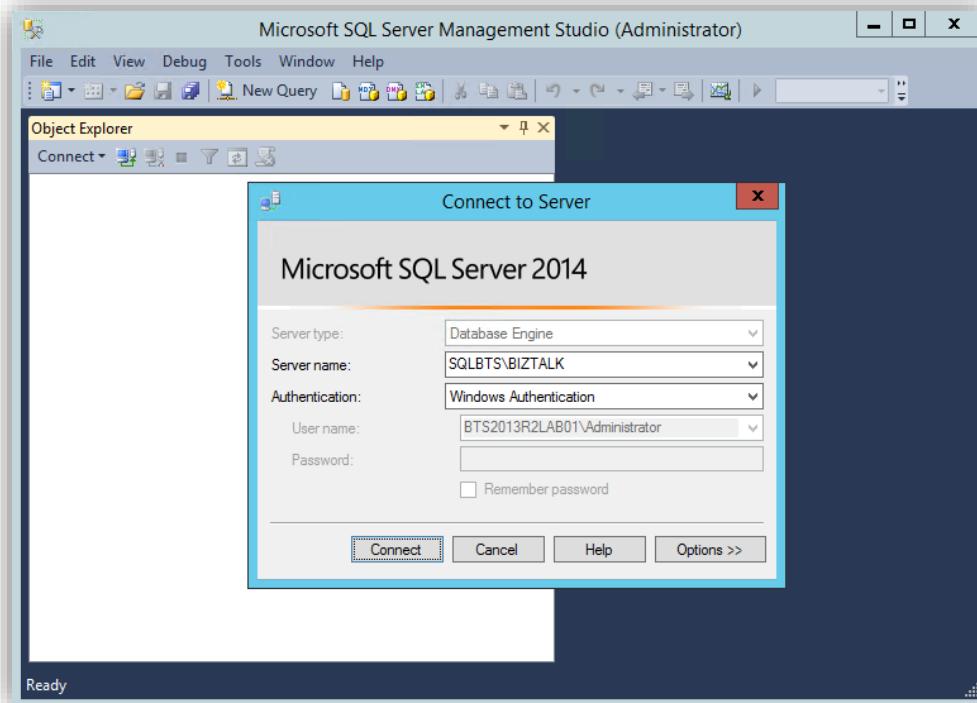
```
Executed: dtctester.exe
DSN: SQLTest
User Name: [REDACTED]
Password: [REDACTED]
tablename= #dtc3895
Creating Temp Table for Testing: #dtc3895
Warning: No Columns in Result Set From Executing: 'create table #dtc3895 (ival int)'
Initializing DTC
Beginning DTC Transaction
Enlisting Connection in Transaction
Executing SQL Statement in DTC Transaction
Inserting into Temp...insert into #dtc3895 values (1)
Warning: No Columns in Result Set From Executing: 'insert into #dtc3895 values (1)'
Verifying Insert into Temp...select * from #dtc3895 (should be 1): 1
Press enter to commit transaction.

Committing DTC Transaction
Releasing DTC Interface Pointers
Successfully Released pTransaction Pointer.
Disconnecting from Database and Cleaning up Handles

C:\Users\[REDACTED]\Desktop\DTCTester>_
```

## SQL Server 2014 Client Tools

This is the easy part, just open SQL Server Management Studio from BizTalk Server machine and try to connect to Database Engine and Analysis Services by using **servername\instance** or the Alias that we create earlier.



## Install and configure BizTalk Server 2013 R2 machine

This part of the article will focus on installing and configuring BizTalk Server 2013 R2 and additional components.

### Install BizTalk Server 2013 R2

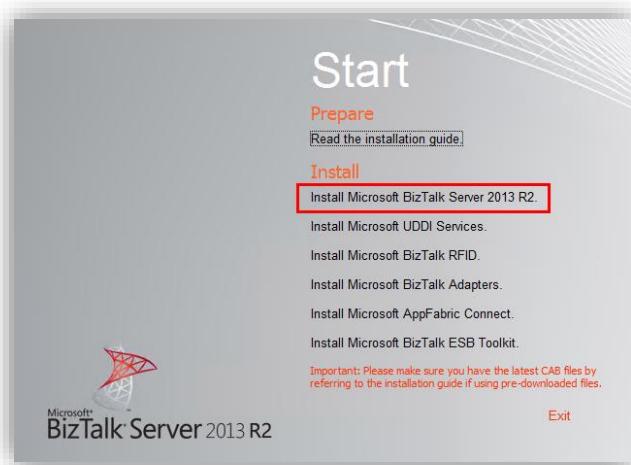
In this section you'll install BizTalk Server, confirm that the installation succeeded, and then configure BizTalk Server.

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:

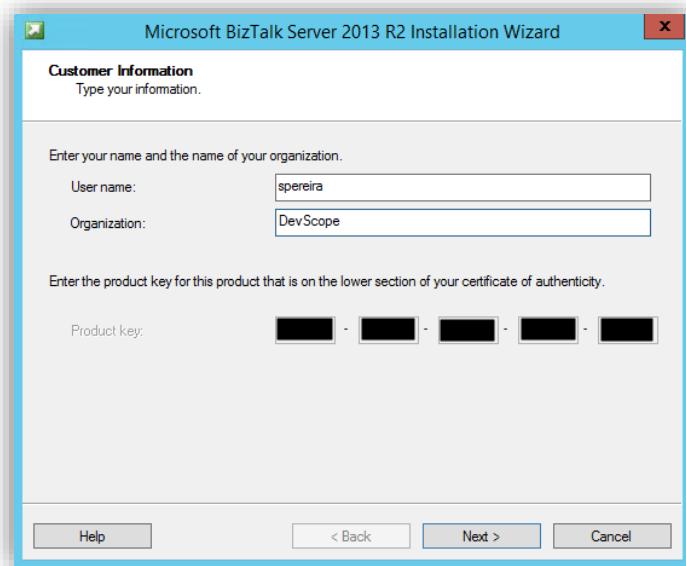
- Use the same account you used when you installed SQL Server.
- Or make sure the account you're using now also has Database Administrator rights and is also local administrator.

To install BizTalk Server 2013 R2

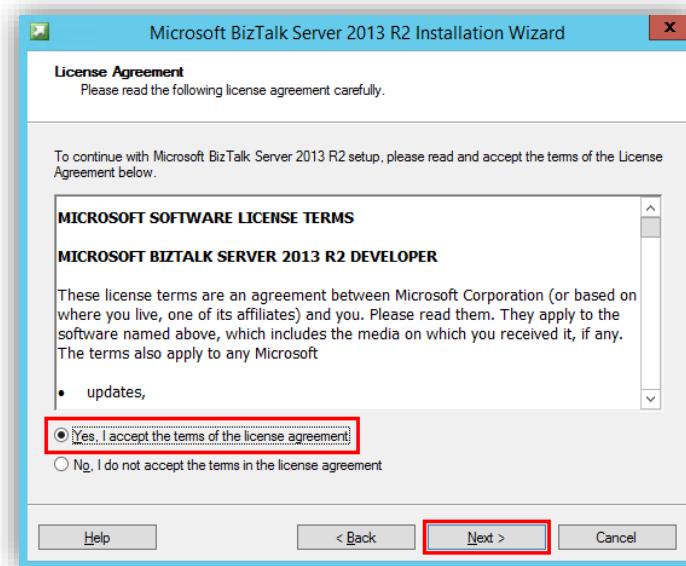
- Close any programs you have open. Run the BizTalk Server 2013 R2 installer as Administrator.
- On the Start page, click "Install Microsoft BizTalk Server 2013 R2"



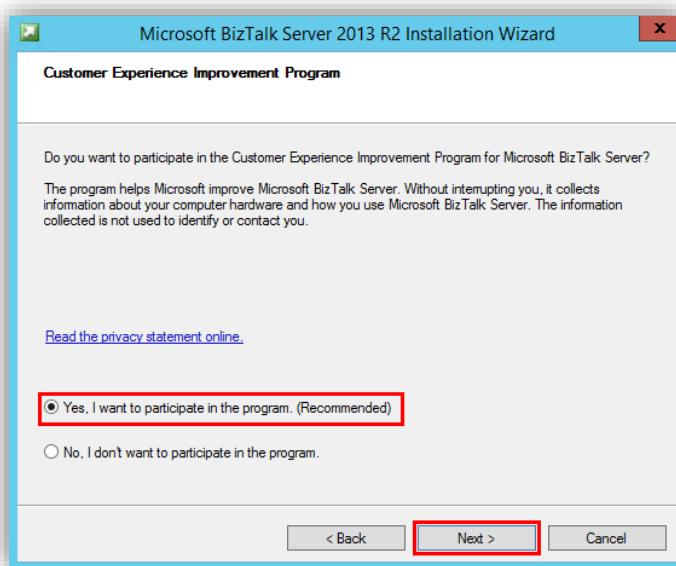
- On the Customer Information page, type your user name and organization, enter your product key, and then click "Next"



- On the License Agreement page, accept the license agreement, and then click “Next”

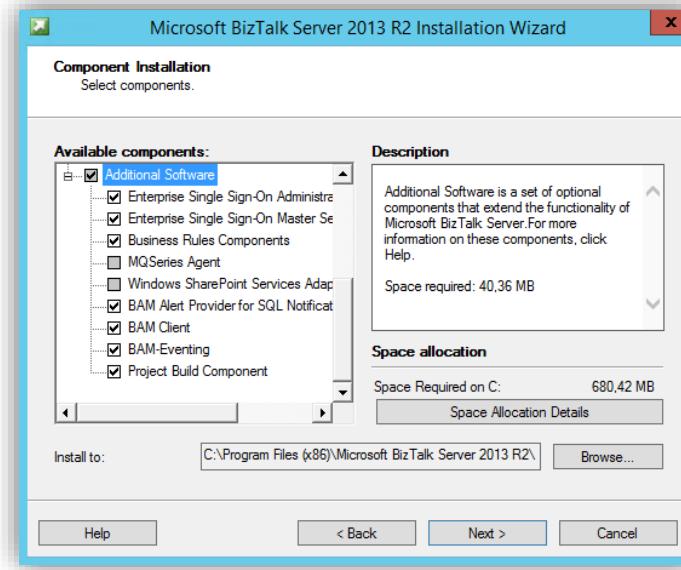
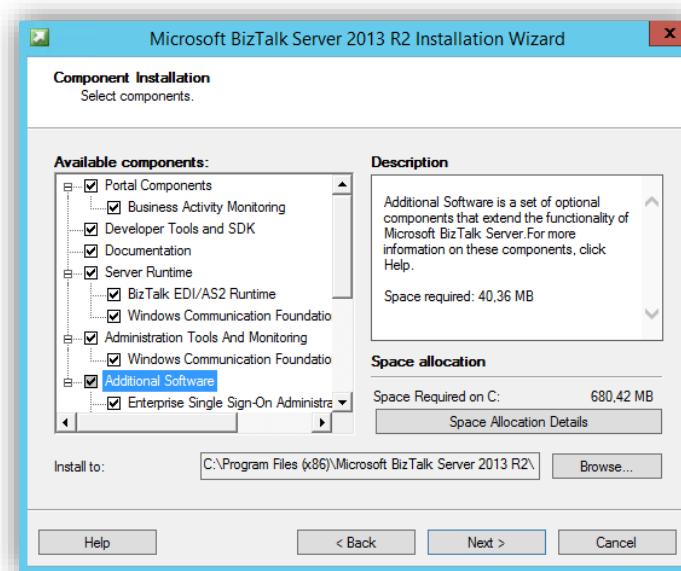


- On the Customer Experience Improvement Program page, specify whether you want to participate in the program, and then click “Next”
  - BizTalk Server 2013 R2 participates in the Customer Experience Improvement Program. As part of this support, you can choose to provide useful feedback to Microsoft 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>).



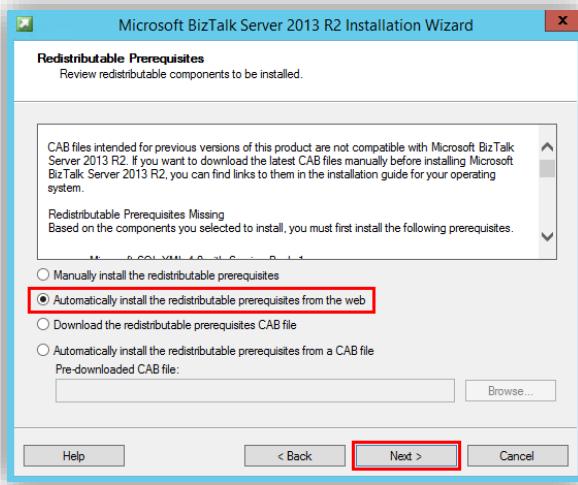
- On the Component Installation page, review the available components and select the ones you want to install.
  - Choose all possible components
  - Accept the default installation location or click Browse to move to the location where you want to install BizTalk Server 2013 R2.

- And then click “Next”

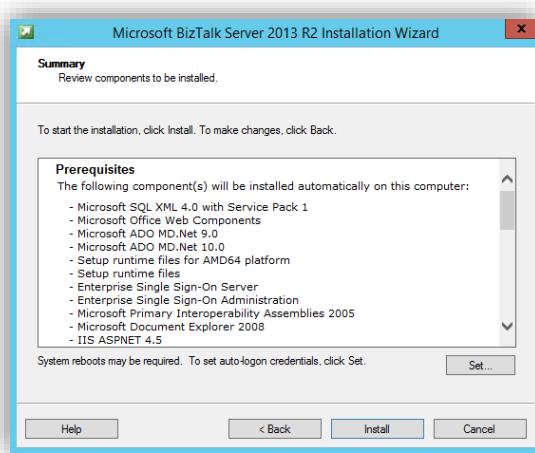


- On the Redistribute Prerequisites page, if your computer is missing a prerequisite component such as ADOMD.NET, Setup is able to install redistributable prerequisites automatically either from the Web or from a pre-downloaded CAB file. You can either:
  - Select “Automatically install the redistributable 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.

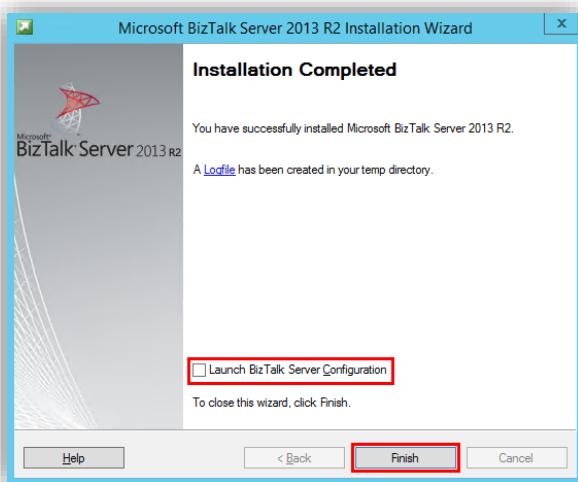
**NOTE:** To understand all options and where to find the Redistributable CAB Files, see: [ERROR! REFERENCE SOURCE NOT FOUND.](#)



- On the Summary page, verify that the components that you select to install are correct.
  - To enable auto-logon after a system reboot, click “Set” and provide your logon information. Auto-logon 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”

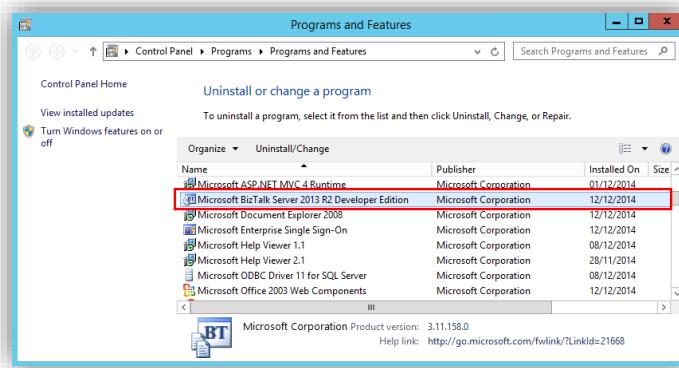


## Verify Your Installation

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 switch to the Start screen.
- Type “Programs and Features” and click in “Programs and Features” option from the Search menu.
- When the list is fully populated, look for “BizTalk Server 2013 R2 <Edition name> Edition”. If it appears in the list, the setup was succeeded.

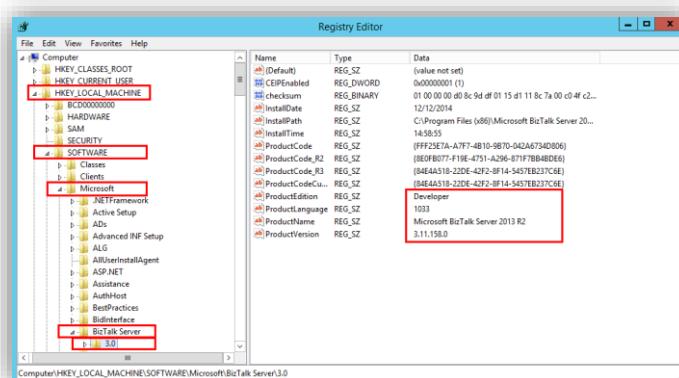


To verify installation using the Registry:

- Press the “Windows key” to switch to the Start screen, type “regedit” and click in “regedit” option from the Search menu.



- 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, and then close the command prompt.

## Configure BizTalk Server

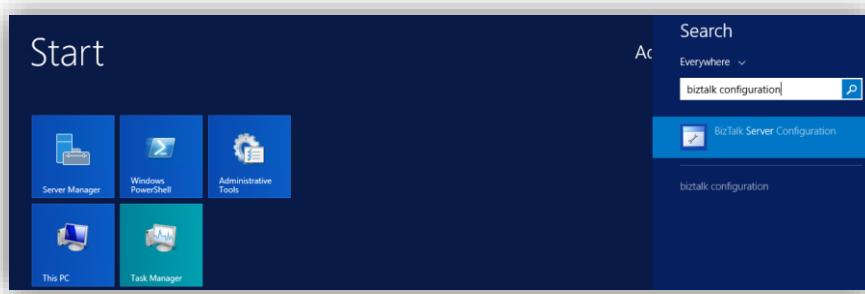
Microsoft BizTalk Server provides the ability to configure the server using custom settings. The custom settings for the server are configured using the database server name, username, and password that you enter into the configuration wizard. See more here: [Custom Configuration](#).

**NOTE:** If your BizTalk Server environment uses SQL Server 2014 and you wish to configure BAM Alerts, you must have already configured SQL Server Database Mail feature.

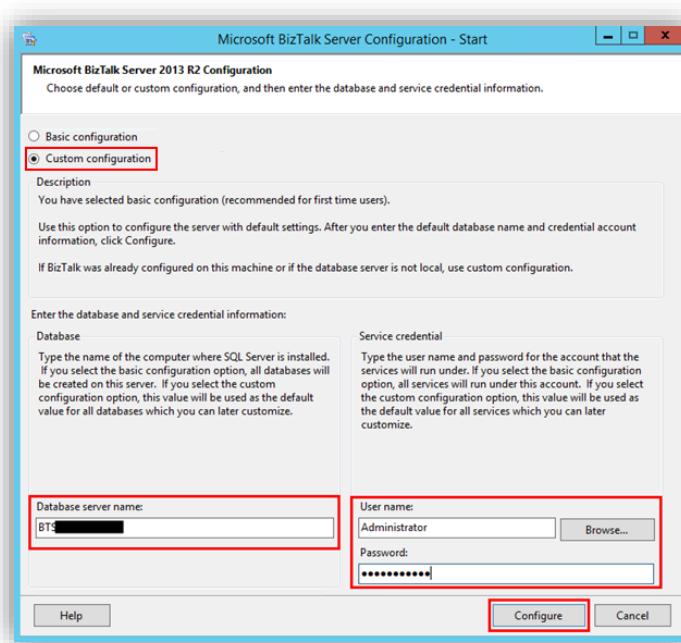
**NOTE:** Because this is a multi-Computer BizTalk Server installation we cannot use a “Basic Configuration” option. You must select “Custom configuration” option.

To configure BizTalk Server 2013 R2 using Custom Configuration:

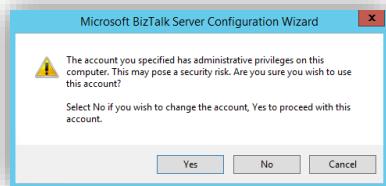
- Press the “Windows key” to switch to the Start screen, type “BizTalk Server Configuration” or “BizTalk”, right-click “BizTalk Server Configuration” option from the Search menu, and then click Run as Administrator.



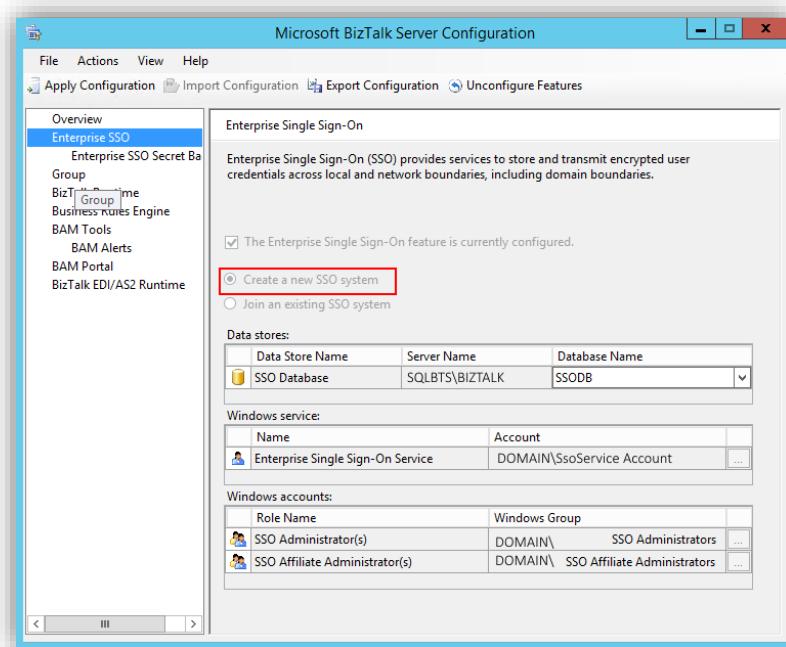
- On the Microsoft BizTalk Server 2013 R2 Configuration page, apply the following configurations and then click “Configure” to continue:
  - Select “Custom configuration” option
  - In the “Database server name” field under “Database” properties, enter the name of the database server.
  - In the “Service credential” properties, type the User name and Password for the account that the BizTalk services will run under.



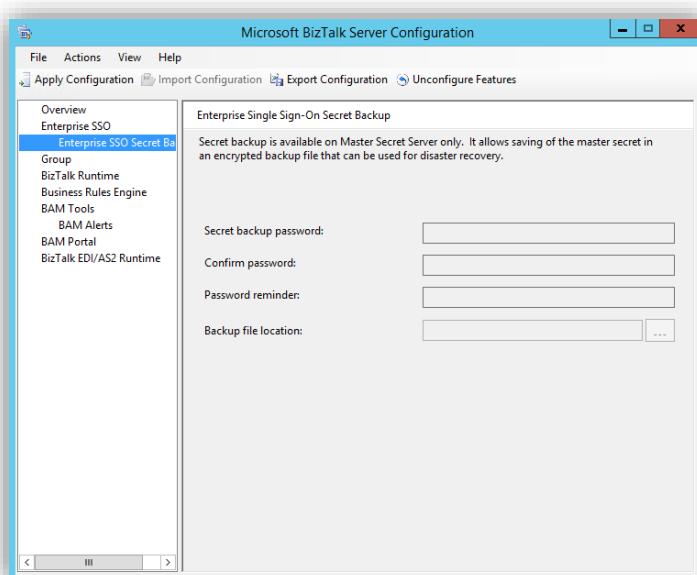
- **Note:** You may receive a warning if you enter a user name with administrative credentials on this computer. Click “Yes” to continue.



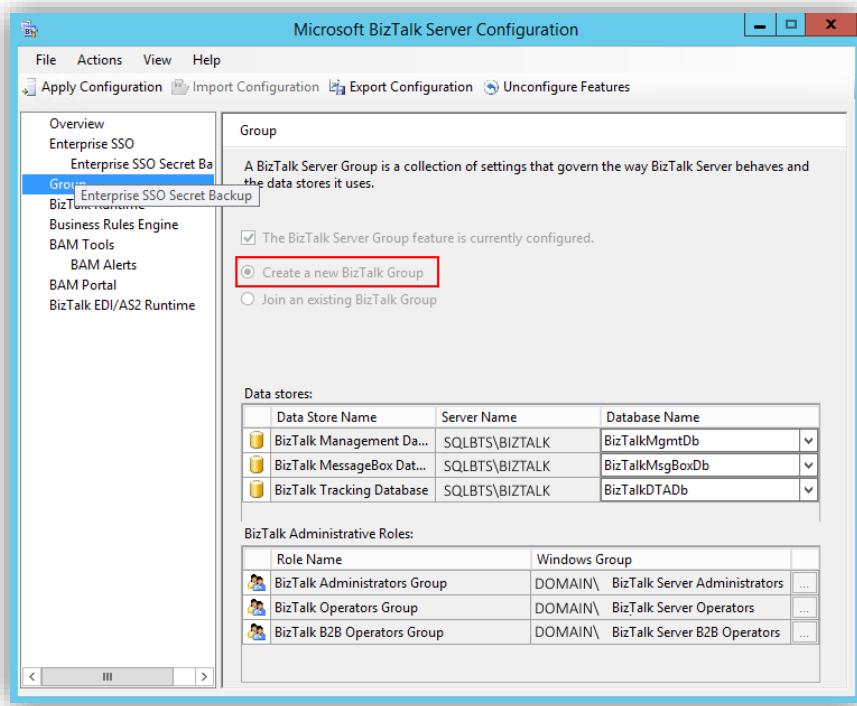
- On Enterprise SSO tab select:
  - “Create a new SSO System” option and place the following configurations



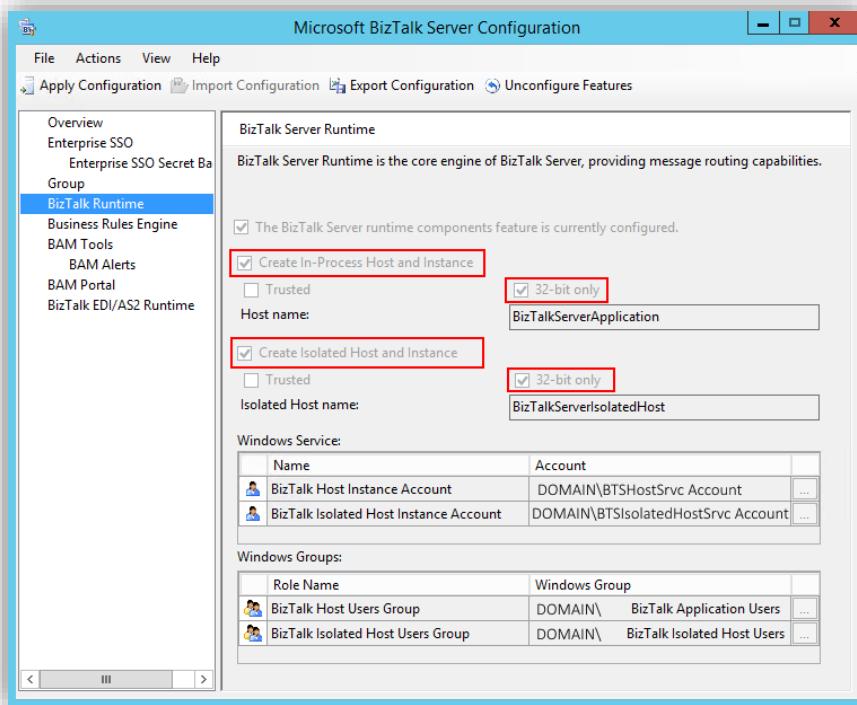
- On Enterprise SSO Secret Backup tab, set a secret backup password, password reminder and the location of the SSO backup file



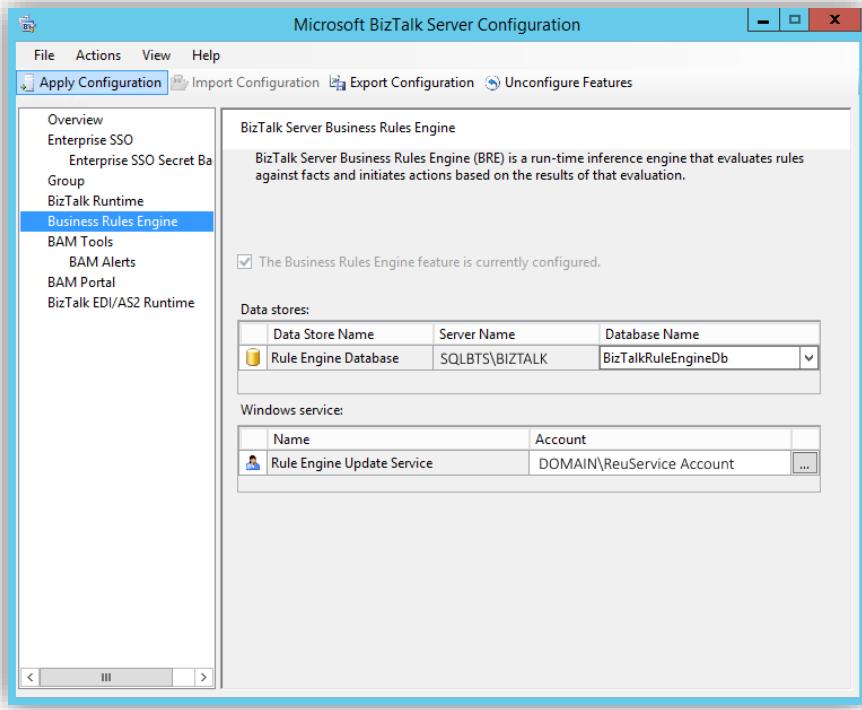
- On Group tab, select “Create a new BizTalk Group” and place the following configurations:



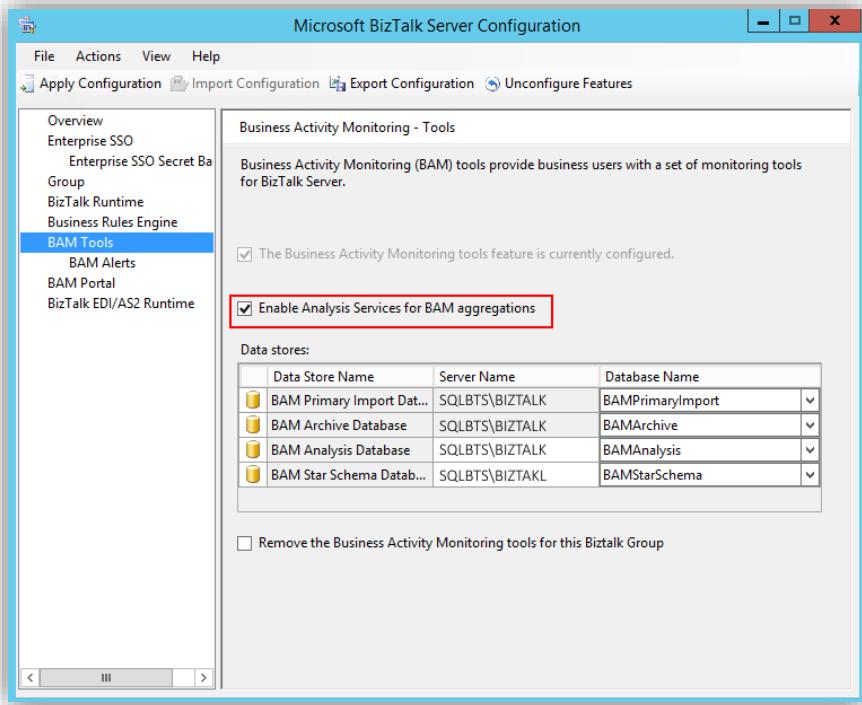
- On BizTalk Runtime tab, select “Create a new In-Process host and instance” and “Create Isolated Host and Instance” with the following configurations



- On Business Rule Engine tab place the following configurations

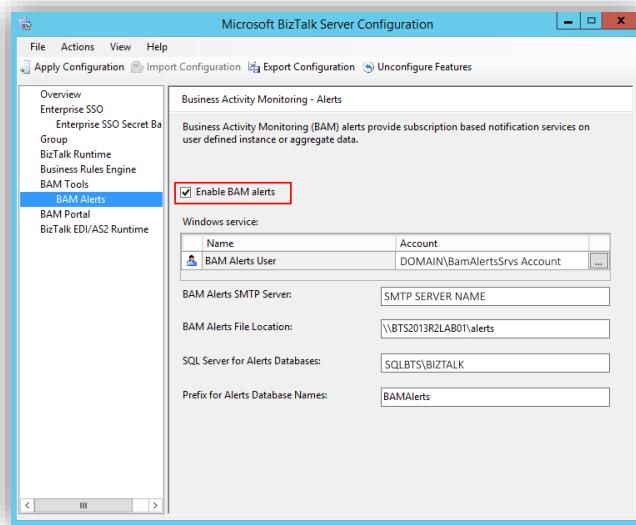


- On BAM Tools tab, select “Enable Analysis Services for BAM aggregations” and place the following configurations

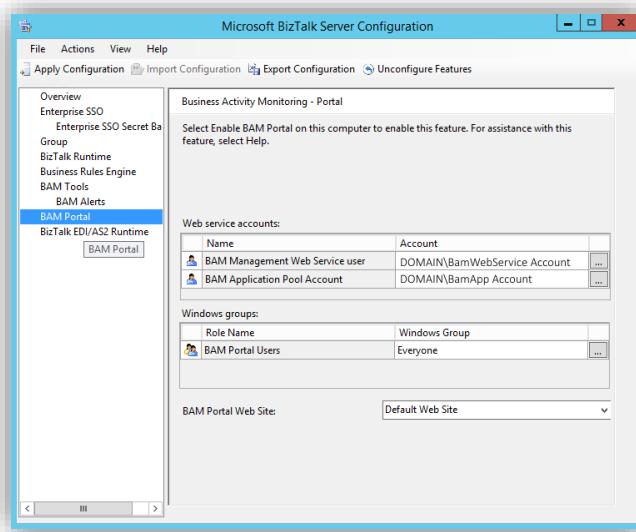


- On BAM Alerts tab, select “Enable BAM Alerts” and place the following configurations:

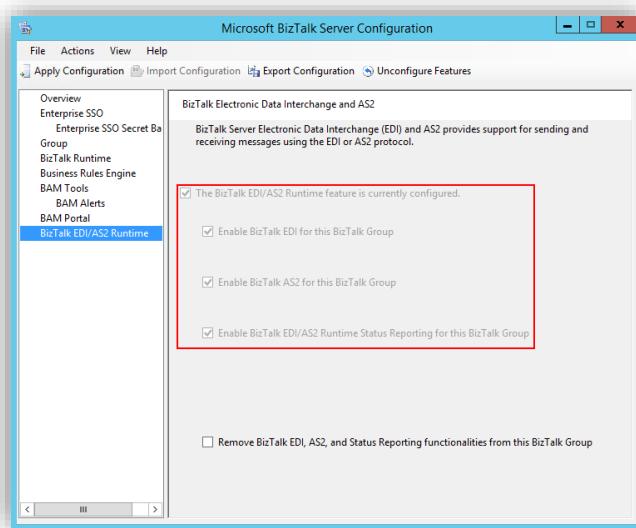
- Note:** If your BizTalk Server environment uses SQL Server 2014 and you wish to configure BAM Alerts, you must have already configured SQL Server Database Mail feature.



- On BAM Portal tab, place the following configurations

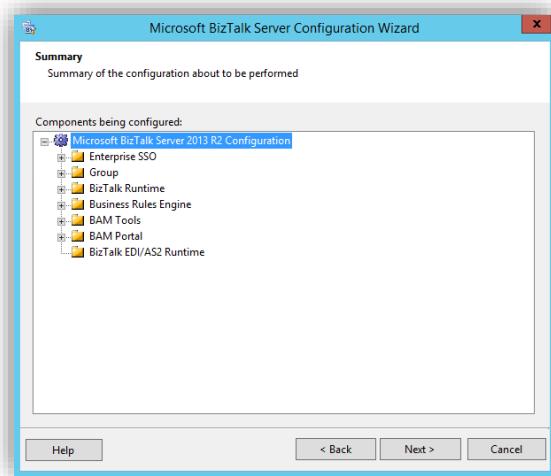


- On BizTalk EDI/AS2 Runtime tab, enable all features

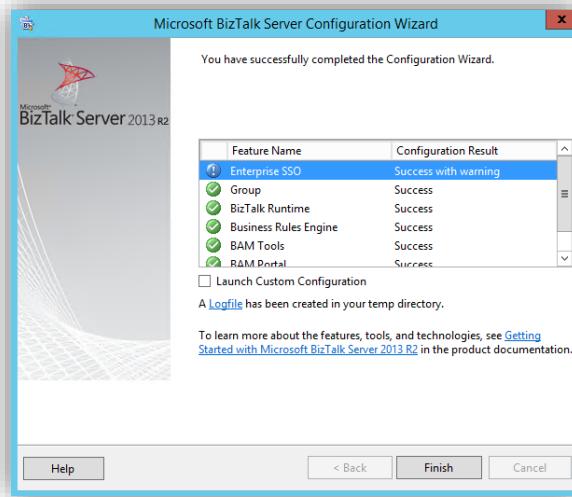


## Installing BizTalk Server 2013 R2 in a Basic Multi-Computer Environment

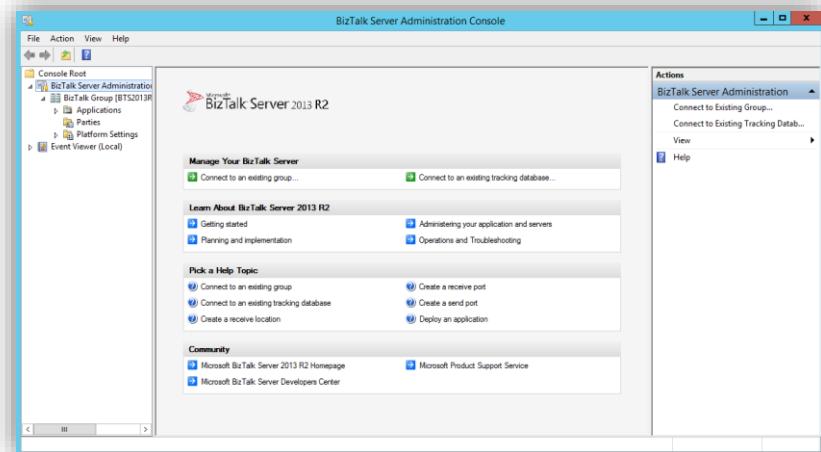
- Click “Apply Configurations”
- On the Summary page, review the configuration about to be performed, and then click “Next”



- On the Completion page, click “Finish”.



We now have BizTalk Server 2013 R2 successfully installed and configured.



You can check if the configuration went well by having a look at the Windows Event Log, there should be a lot of Information entries and no errors or warning related to BizTalk.

You should also start the BizTalk Server administration console and verify the BizTalk Server host instance is started (found under BizTalk Group\Platform Settings\ Host Instances). Try stopping and starting the host instance.

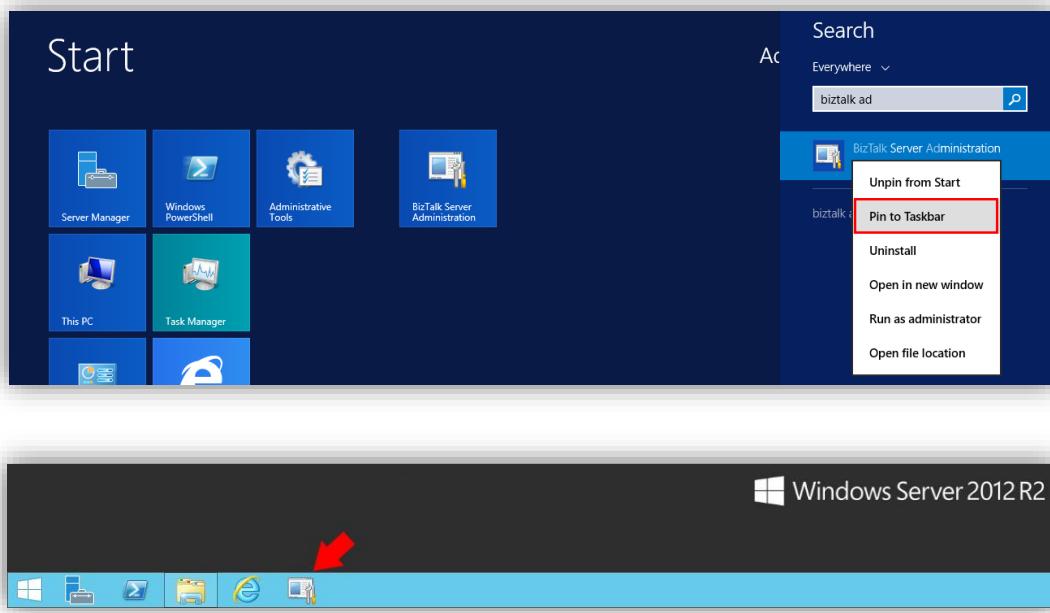
### Pin BizTalk Server Administration to taskbar

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 2012 or 2012 R2, almost all programs are “hidden” and can be easily be accessed through context search from the Start screen. 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 switch to the Start screen, type “BizTalk Server Administration” or “BizTalk” and right click in “BizTalk Server Administration” option from the Search menu, and select “Pin to taskbar” option to add “BizTalk Server Administration” to your desktop taskbar.



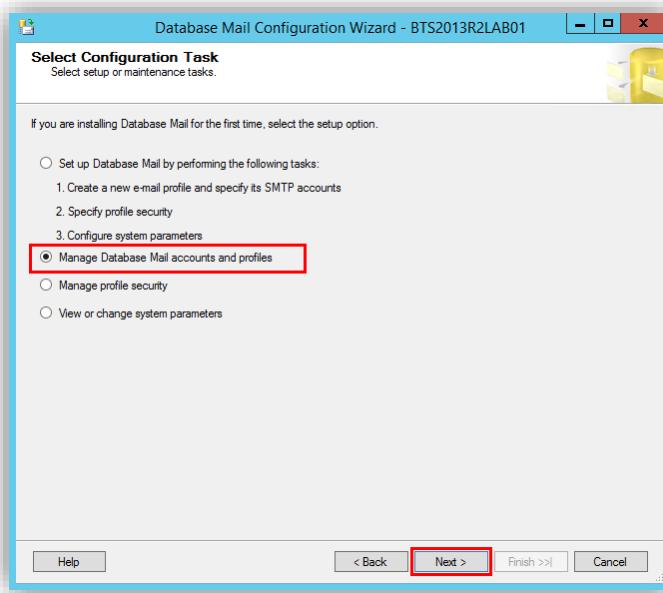
### Validate Mail account used by BizTalk to send BAM Alerts

After you configure with success BizTalk Server 2013 R2 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.

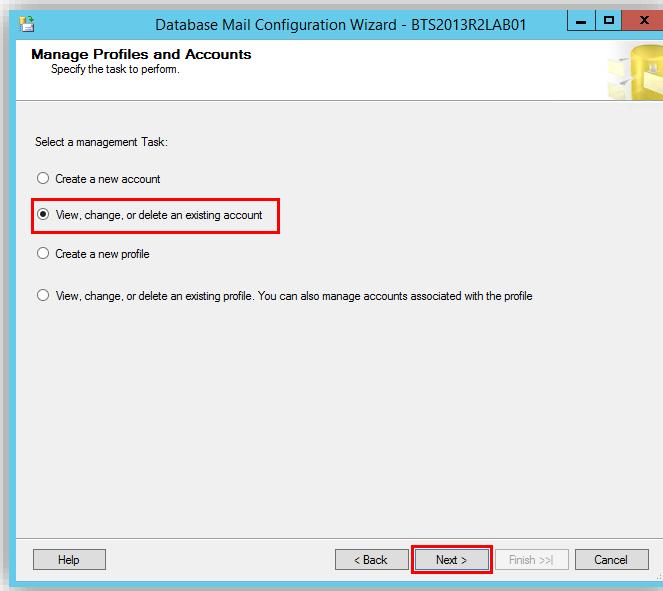
To Validate Mail account used by BizTalk to send BAM Alerts:

- Press the “Windows key” to switch to the Start screen, type “SQL Management” or “SQL” and click in “SQL Server 2014 Management Studio” option from the Search menu.

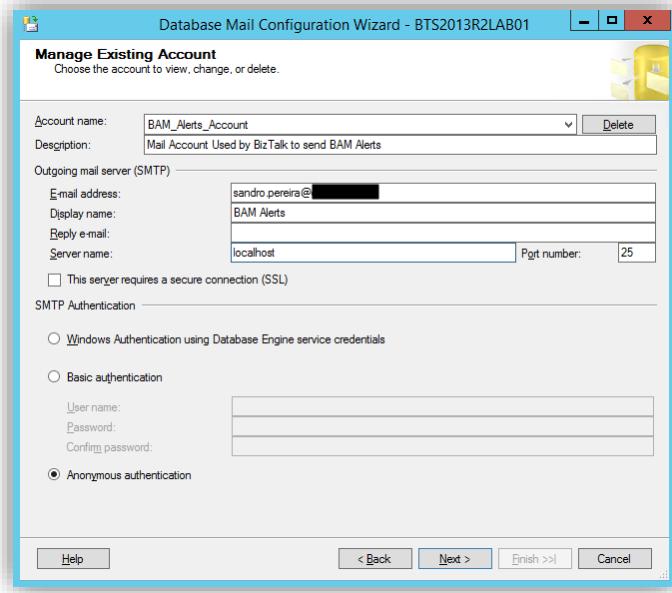
- In Object Explorer panel, connect to the SQL Server instance you want to configure Database Mail on, and expand the server tree.
- Expand the “Management” node and double click “Database Mail” to open the Database Mail Configuration Wizard.
- On the Welcome to Database Mail Configuration Wizard page, click “Next” to continue
- On the Select Configuration Task page, select “Manage Database Mail accounts and profiles” option and click “Next”



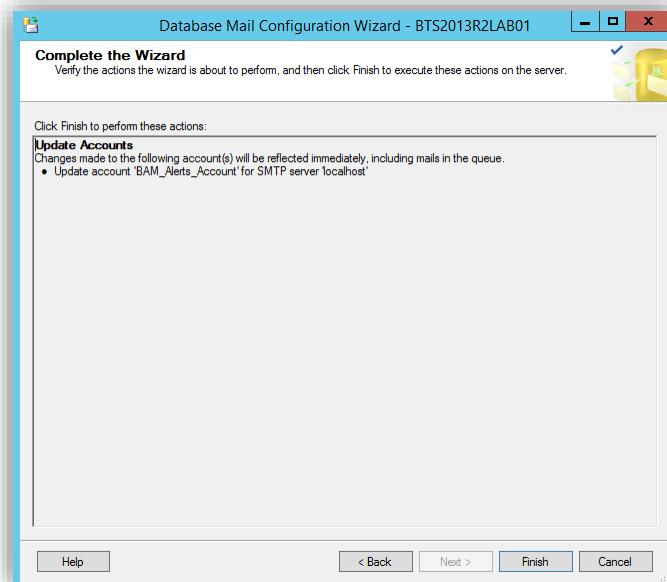
- On the Manage Profiles and Accounts page, select “View, change or delete an existent account” option, and click “Next”



- 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.

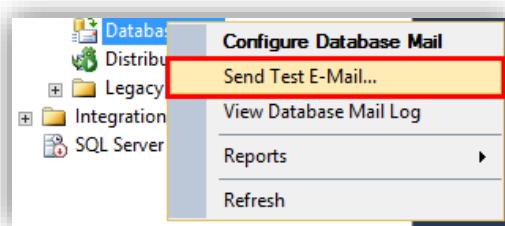


- On the Complete the Wizard page, click “Finish”.

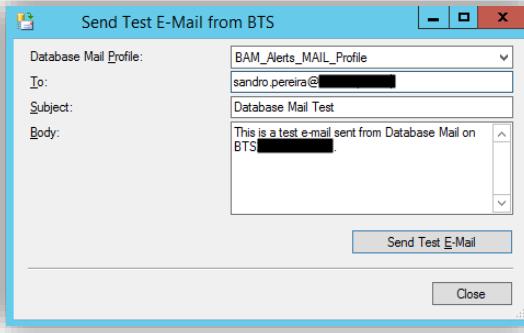


Finally you should test sending an email with this Database Mail Account, to do that:

- 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 additional 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:

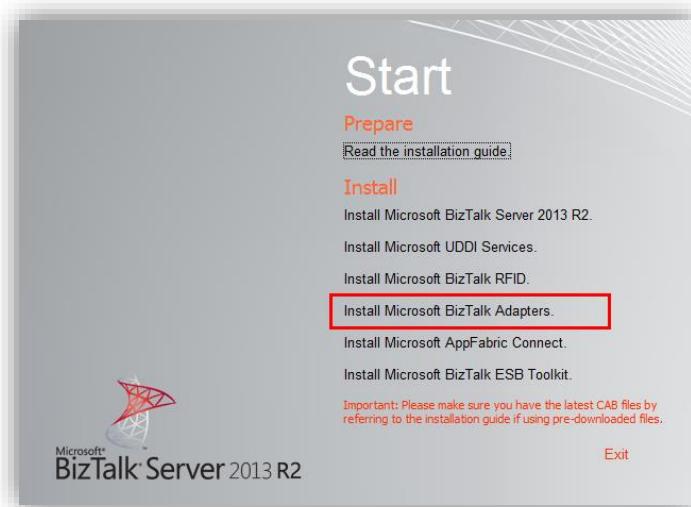
- If you want to run the adapters under a 32-bit BizTalk process (Host Instance): you need to install Microsoft BizTalk Adapter Pack.
- If you want to run the adapters under a 64-bit BizTalk process (Host Instance): you need to install Microsoft BizTalk Adapter Pack (x64).

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.

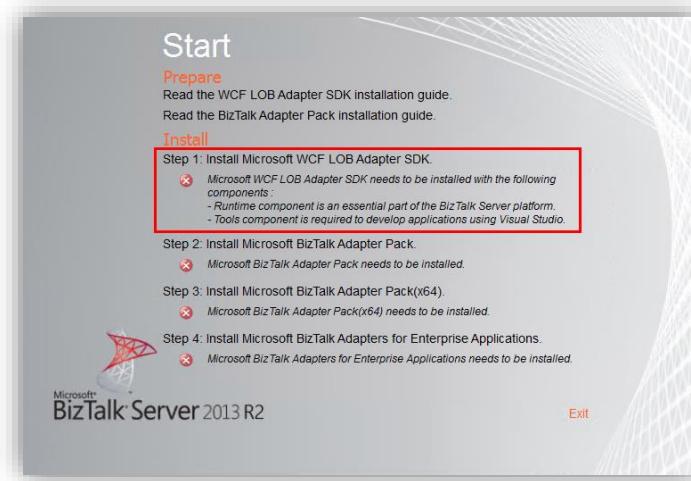
### Steps to install BizTalk Adapter Pack

To install BizTalk Adapter Pack:

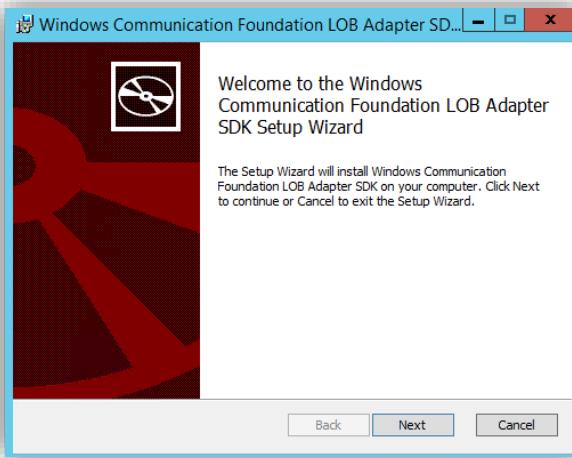
- Close any programs you have open. Run the BizTalk Server 2013 R2 installer as Administrator.
- On the Start page, click “Install Microsoft BizTalk Adapters”



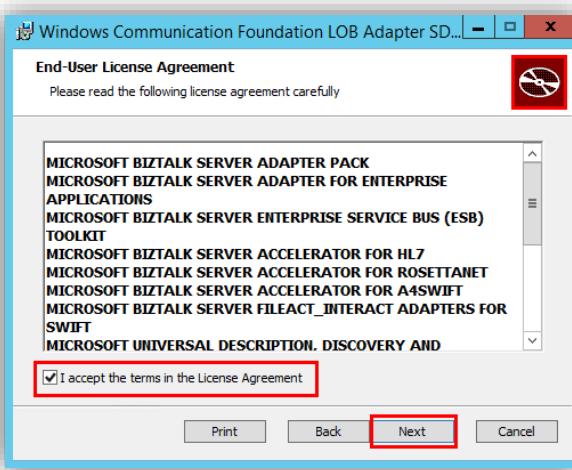
- In the next Start page, the first step is to install WCF LOB Adapter SDK, select the “Step 1. Install Microsoft WCF LOB Adapter SDK”. An installer of SDK is launched.



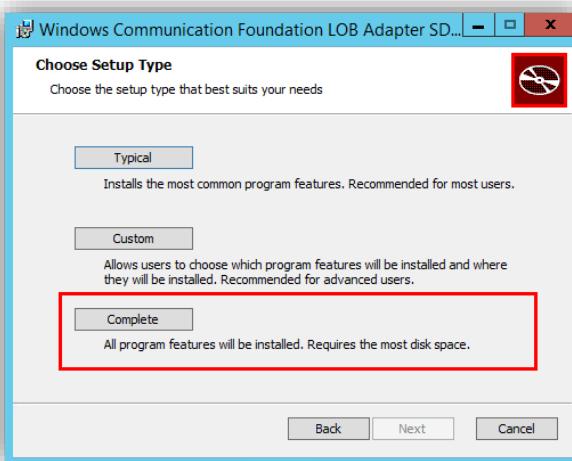
- The WCF LOB Adapter SDK is a collection of a run-time engine and tools that help adapter developers create service-oriented interfaces to existing LOB systems by using WCF. The goal of the SDK is to facilitate uniform development of reusable, metadata-oriented, WCF-based adapters that enable enterprise 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”



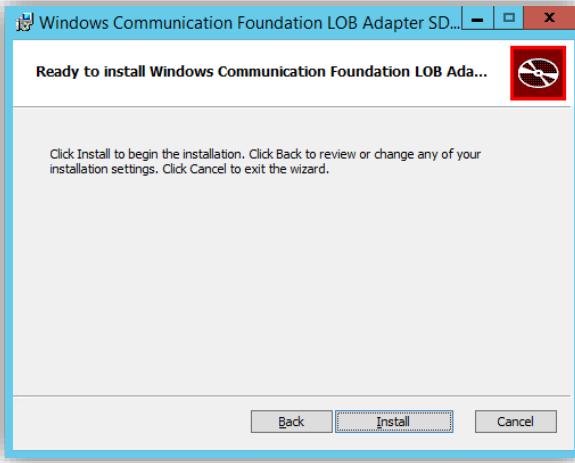
- On the End-User License Agreement page, select “I accept the terms in the License Agreement” to accept the license agreement and click “Next”



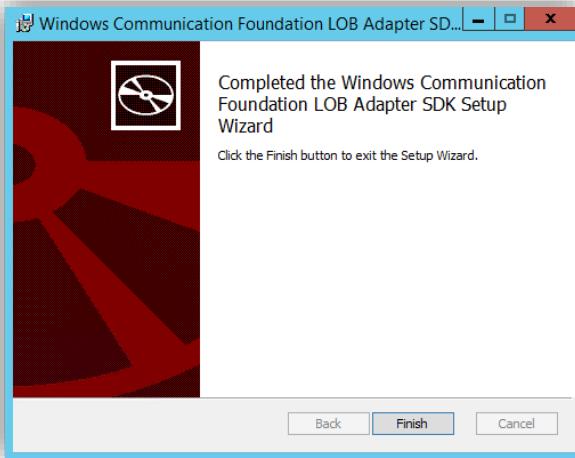
- In the Choose Setup Type page, select the installation type “Complete”:
  - Typical: will install the common run time and tools,
  - Custom: will allow you to select the features that you want to install and the installation location.
  - Complete: will install all the features.



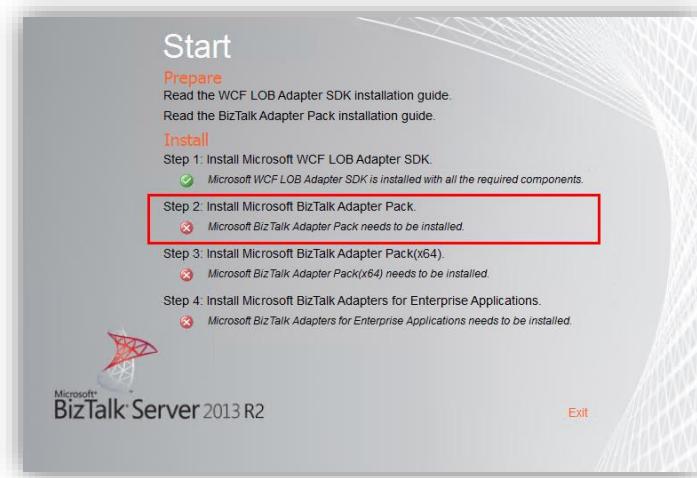
- On the Ready to install WCF LOB adapter SDK page, click “Install”



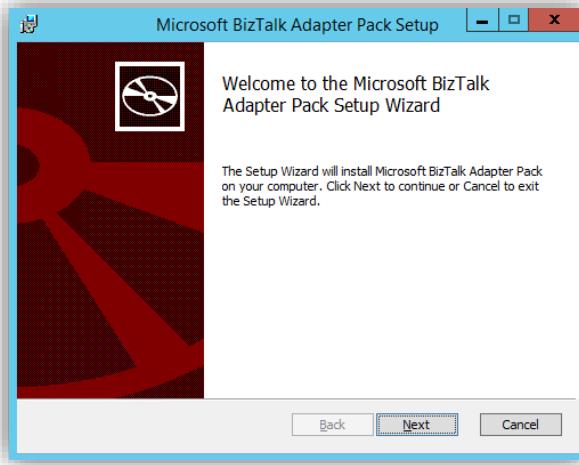
- On the Completed the Windows Communication Foundation LOB Adapter SDK Setup Wizard page, click "Finish"



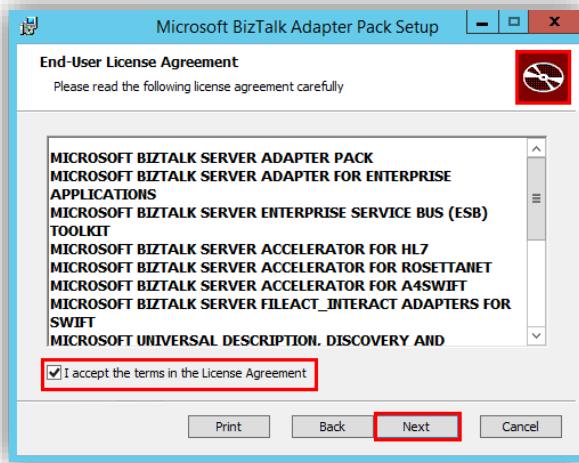
- Back to the Start page, the second step is installation of the Adapter Pack (x86), select the "Step 2. Install Microsoft BizTalk Adapter Pack". An installer of SDK is launched.



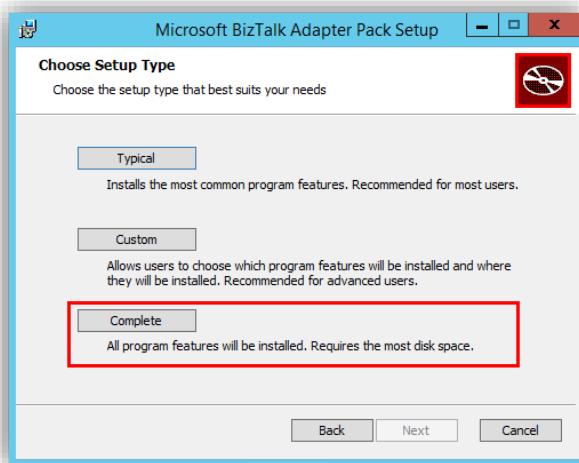
- On the Welcome to the Microsoft BizTalk Adapter Pack Setup Wizard page, click "Next"



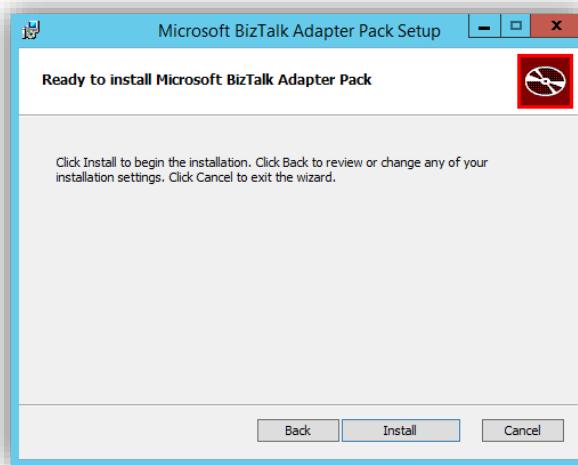
- On the End-User License Agreement page, select “I accept the terms in the License Agreement” to accept the license agreement and click “Next”



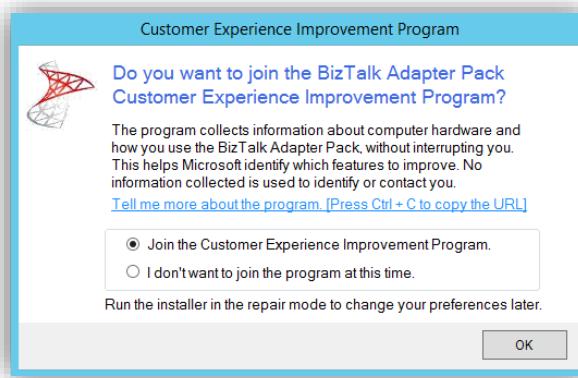
- In the Choose Setup Type page, select the installation type “Complete”:
  - Typical: will install the common run time and tools,
  - Custom: will allow you to select the features that you want to install and the installation location.
  - Complete: will install all the features.



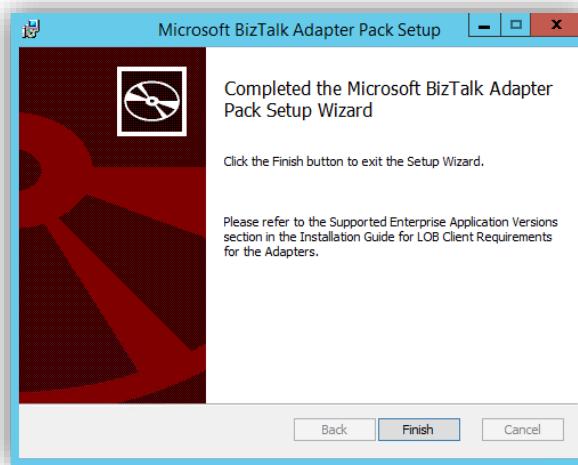
- On the Ready to install Microsoft BizTalk Adapter Pack page, click “Install”



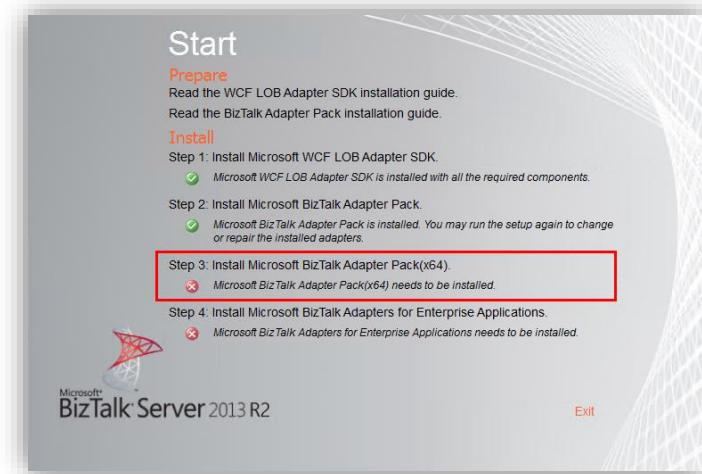
- On the Customer Experience Improvement Program page, select if you want to join the customer experience improvement program or not and click “OK”



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



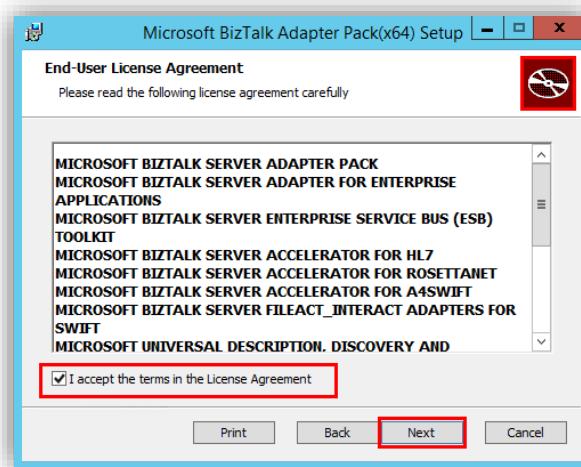
- Back to the Start page, the next step is installing the Microsoft BizTalk Adapter Pack (x64) - note that before you install this pack you have to install x86 first - select the “Step 3. Install Microsoft BizTalk Adapter Pack(x64)”. An installer of SDK is launched.



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

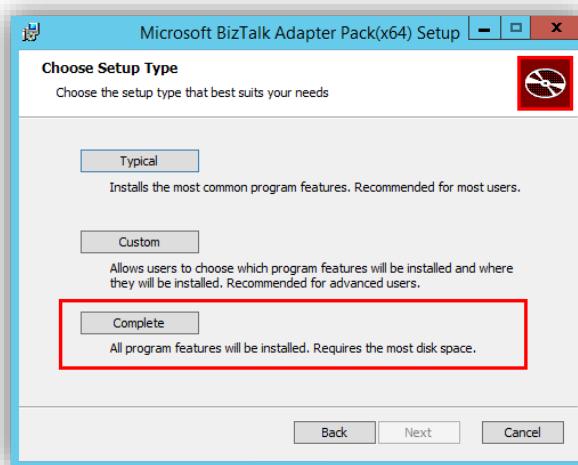


- On the End-User License Agreement page, select “I accept the terms in the License Agreement” to accept the license agreement and click “Next”

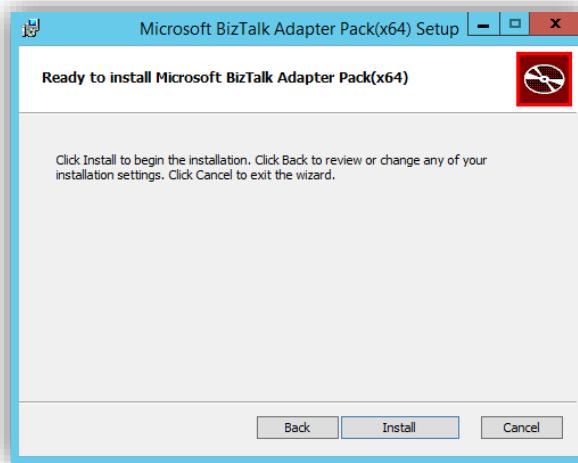


- In the Choose Setup Type page, select the installation type “Complete”:
  - Typical: will install the common run time and tools,
  - Custom: will allow you to select the features that you want to install and the installation location.

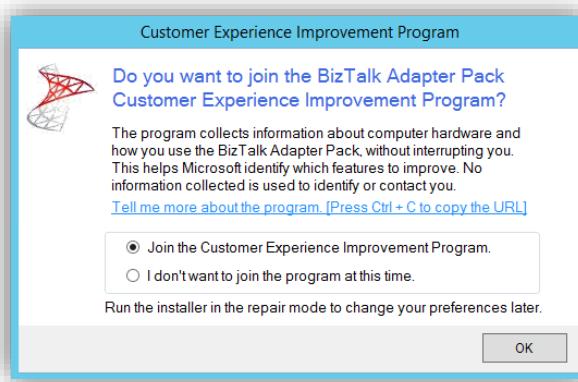
- Complete: will install all the features.



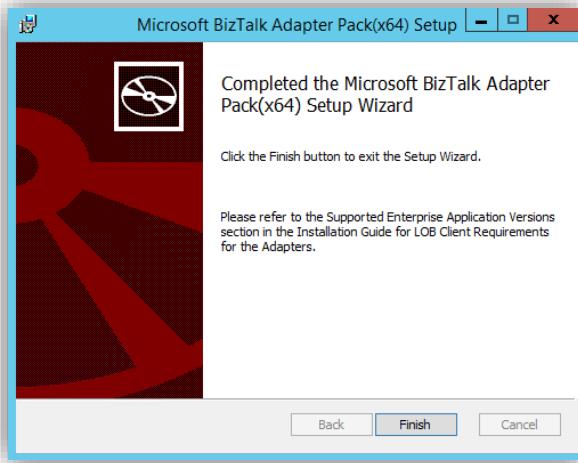
- On the Ready to install Microsoft BizTalk Adapter Pack(x64) page, click "Install"



- 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"



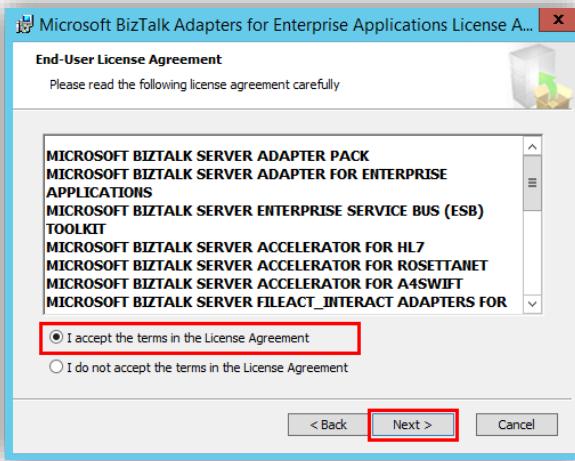
- Back to the Start page, the final step is installing the Microsoft BizTalk Adapters for Enterprise Applications, select the “Step 4. Install Microsoft BizTalk Adapters for Enterprise Applications”. An installer of SDK is launched.



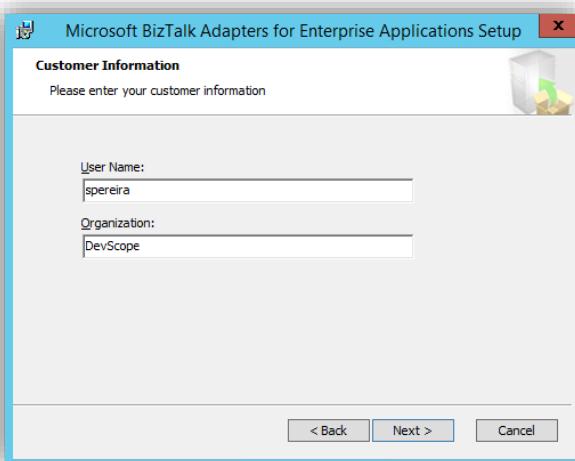
- On the Welcome to the Microsoft BizTalk Adapters for Enterprise Applications Setup Wizard page, click “Next”



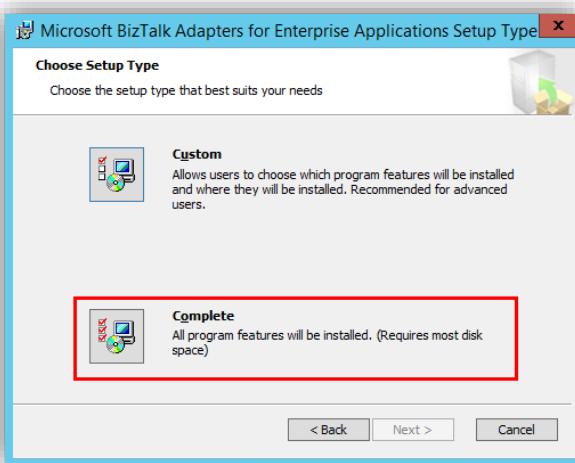
- On the End-User License Agreement page, select “I accept the terms in the License Agreement” to accept the license agreement and click “Next”



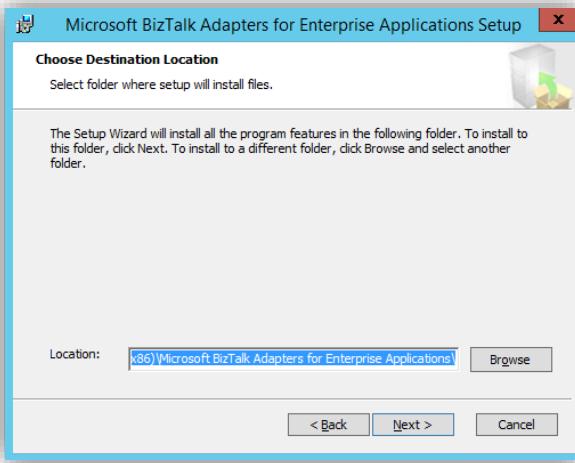
- In the Customer Information page, type your User Name and Organization and click “Next” to continue.



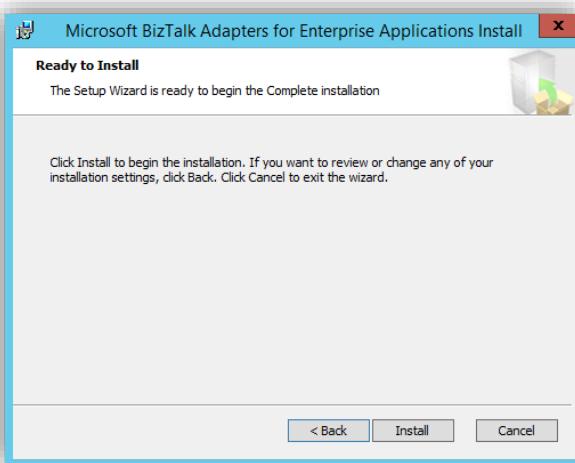
- In the Choose Setup Type page, select the installation type “Complete”:
  - Custom: will allow you to select the features that you want to install and the installation location.
  - Complete: will install all the features.



- 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”



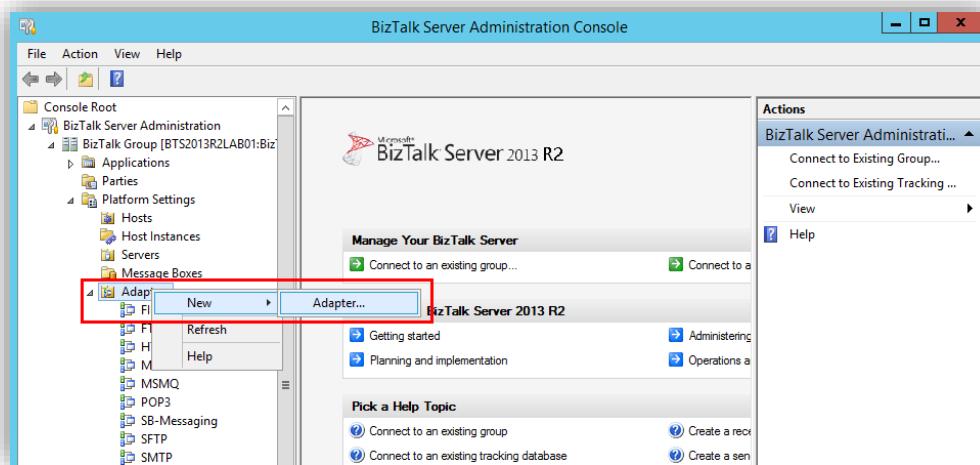
- Close the Start page, click “Exit”.



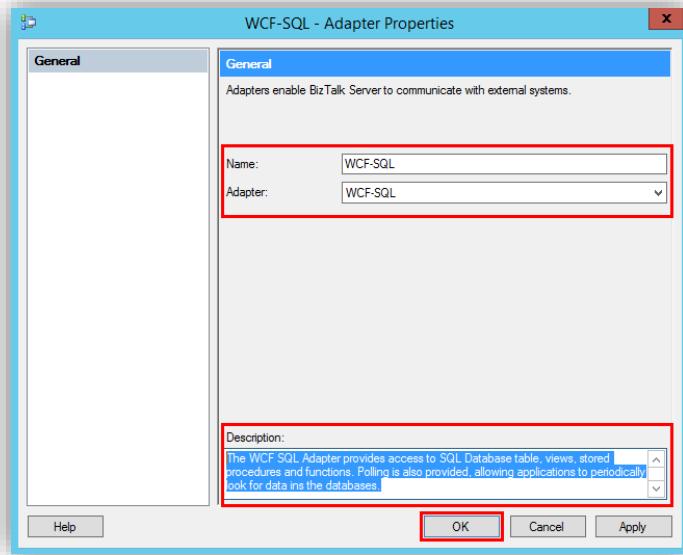
## Add adapters to BizTalk Administration Console

As it happens with all adapters that we installed 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 describing how can we add the enterprise adapters, or any other custom adapter, on the BizTalk Administration Console. To accomplish that we need to:

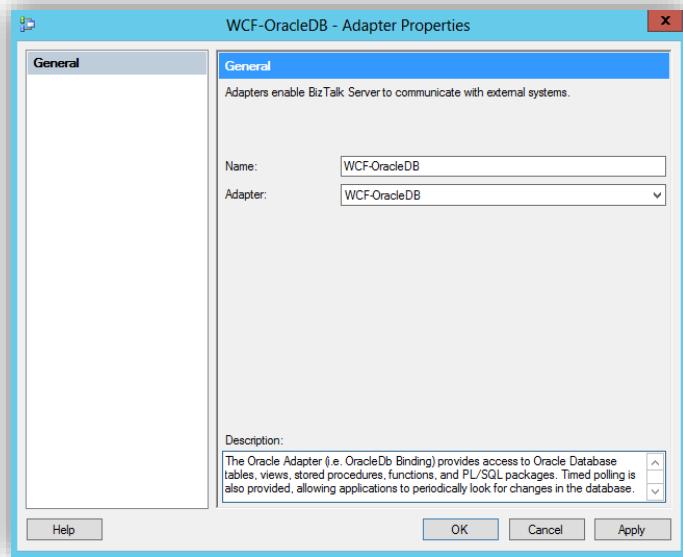
- Open BizTalk Administration Console by pressing the “Windows key” to switch to the Start screen, type “BizTalk Server Administration” or “BizTalk”, click “BizTalk Server Administration” option from the Search menu
- In the console left tree, expand “BizTalk Server Administration → BizTalk Group → Platform 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 Database table, 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 configurations 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).

Until this date there is available two Cumulative Update for BizTalk Server 2013 R2.

List of CU available are referenced in my blog:

- [BizTalk Server: List of Service Packs and Cumulative Updates available](#)
- Or in Microsoft: [Service Pack and cumulative update list for BizTalk Server](#)

## Configure BizTalk Server SQL Jobs

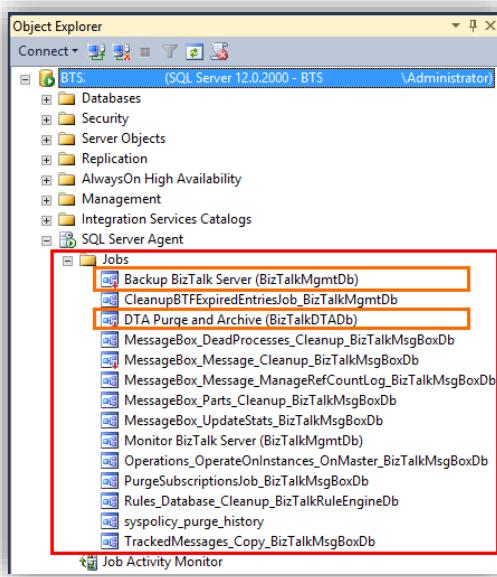
BizTalk Server databases and their health are very important for a successful BizTalk Server database messaging environment. Although there can be many settings that we can configure, like auto-growth settings for BizTalk Databases (you can learn more here), there are two main things that we must understand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

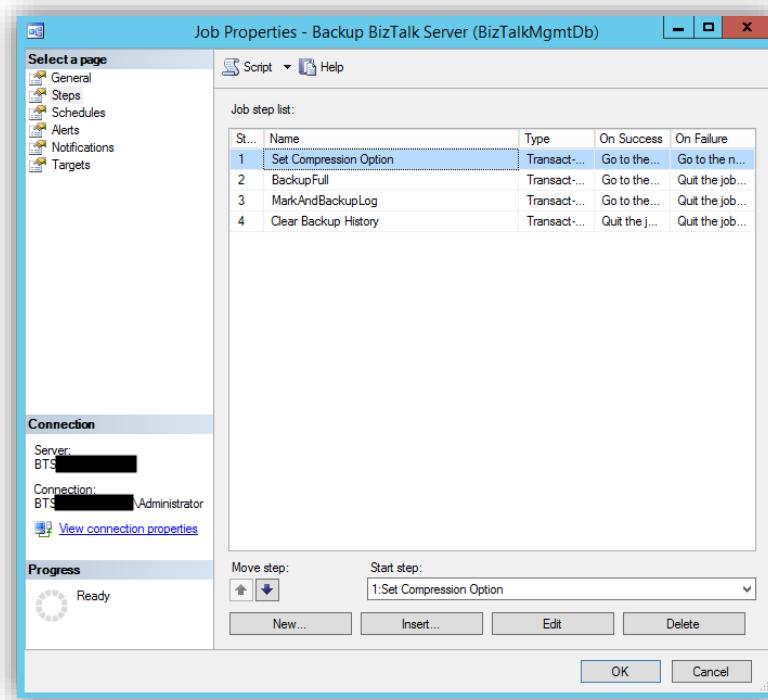
This is the job provided by Microsoft to do a best practice backup of the BizTalk databases. This job has to be configured for it to be able to run.

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 switch to the Start screen, type “SQL Management” or “SQL” and click in “SQL Server 2014 Management Studio” option to switch to the Start screen.
- 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 clear 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:

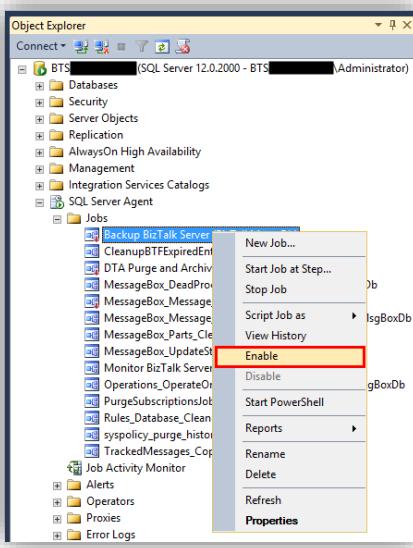
- @UseLocalTime: This is an extra parameter that you can also add that tells the procedure to use local time
  - `exec [dbo].[sp_DeleteBackupHistory] @DaysToKeep=14 , @UseLocalTime =1`

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

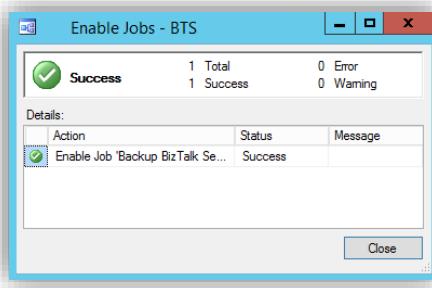
**IMPORTANT NOTE:** This job step does not provide functionality for deleting backup files that have accumulated over time. You can solve this problem by implementing you custom `sp_DeleteBackupHistory` or by creating a Maintenance Plan to delete BizTalk Database Backups files (see more details [ERROR! REFERENCE SOURCE NOT FOUND.](#))

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”.



### How to configure DTA Purge and Archive (BizTalkDTADb)

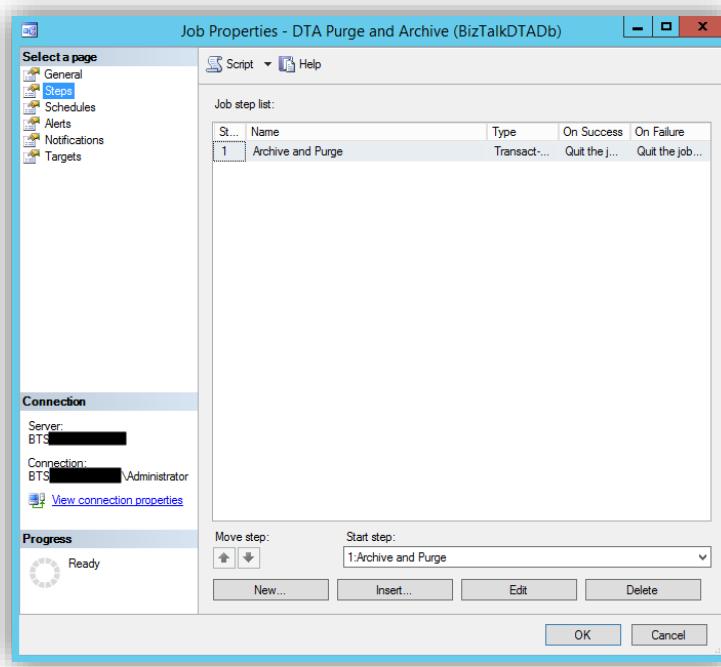
This job automates the archiving of tracked messages and the purging of the BizTalk Tracking database to maintain a healthy system and to keep the tracking data archived for future use.

And it's 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 2014 Management Studio”, if it is not already open, press the “Windows key” to switch to the Start screen, type “SQL Management” or “SQL” and click in “SQL Server 2014 Management Studio” option from the Search 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 “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 simple 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 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 “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 disable this job.

## Optimize the BizTalk Server 2013 R2 environment

This part of the article will focus on optimizing some BizTalk Server 2013 R2 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 database 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 functionalities 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 is too late. The result of that is... lots of times we just remember when the disks are full and everything stop to work!

You can solve this problem by implementing you 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 avoid to change 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 allows DBA's to have flexibility to create a workflow to execute several tasks required to make sure that database are 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's files from our file system.

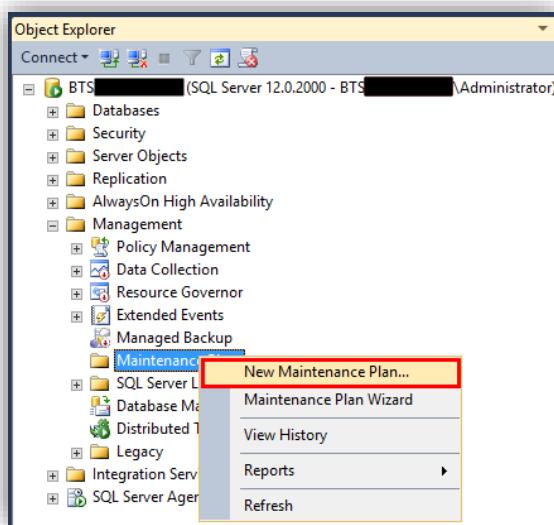
The main advantage of this approach is that will allow us more flexibility for further changes and we can also use them to other backup's that we have.

**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.

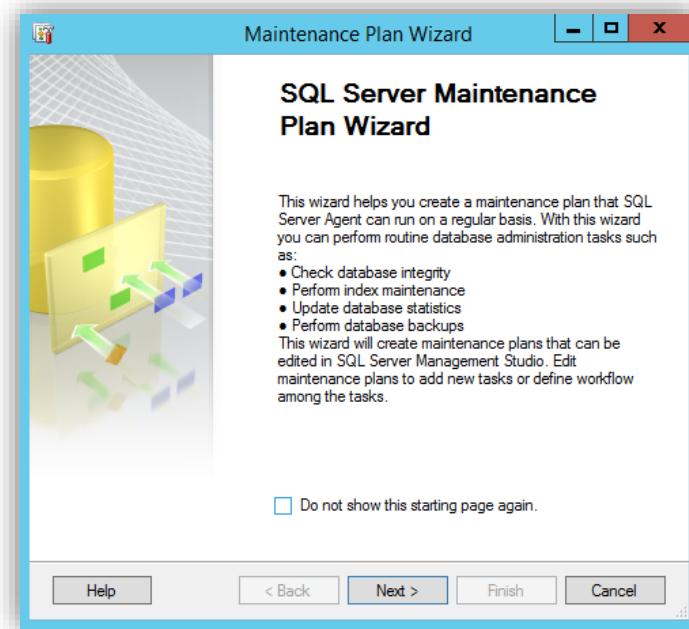
**IMPORTANT NOTE:** this example is created to run in a developer machine, so if you are implementing this approach in production environments make sure to keep the backups for the time you see that fit your requirements or make sure the backups are save in an external storage before you delete this files from the file system.

To create the maintenance plan you need to:

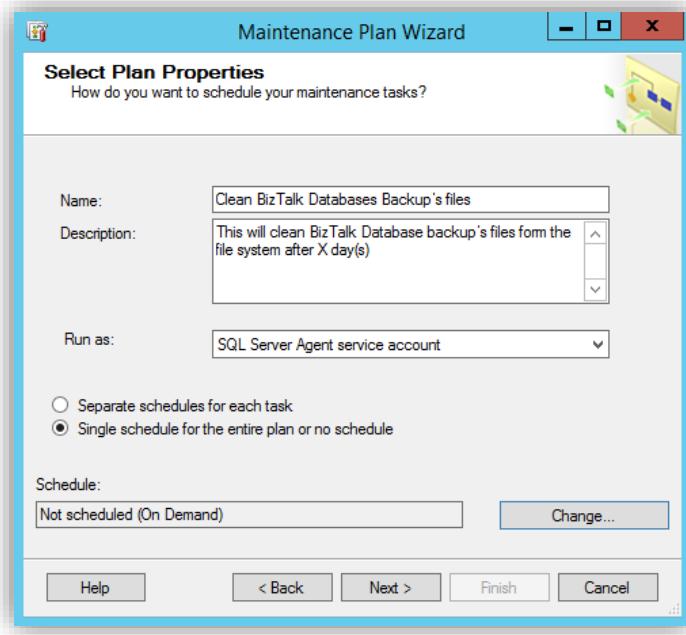
- Open the SQL Server Management Studio by pressing the “Windows key” to switch to the Start screen, type “SQL” or “SQL Management” and click in “SQL Server 2014 Management Studio” option from the Search menu.
- Expand the server and then the “Management” folder.
- Right-click “Maintenance Plans” and select “Maintenance Plan Wizard”. This launches the wizard and you can now step through and create a plan customized to meet your maintenance requirements.



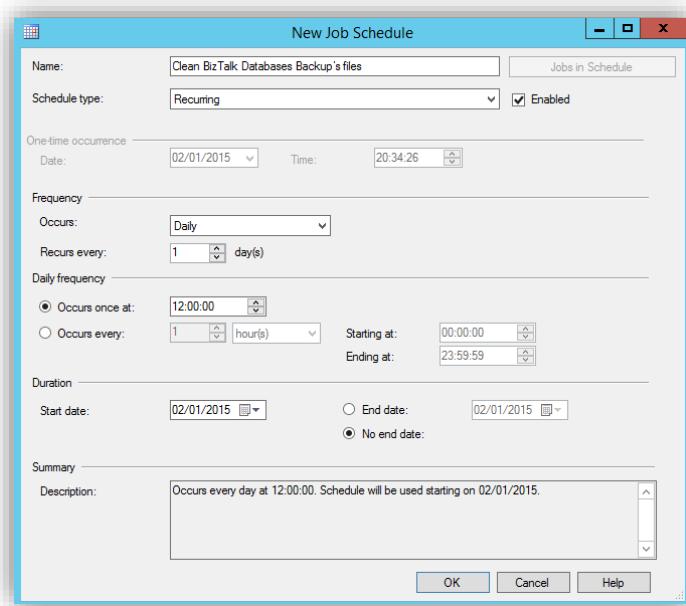
- On the SQL Server Maintenance Plan Wizard page, click “Next”.



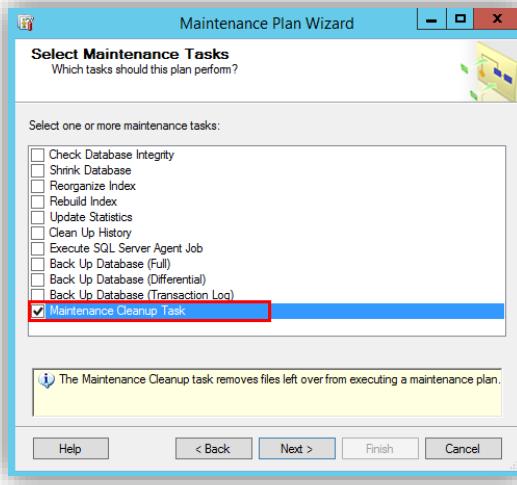
- On the “Select Plan Properties” page:
  - In the “Name”: enter the name of the maintenance plan you are creating.
    - Clean BizTalk Databases Backup’s files
  - In the “Description”: enter a briefly describe your maintenance plan.
    - This will clean BizTalk Database backup’s files form the file 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.



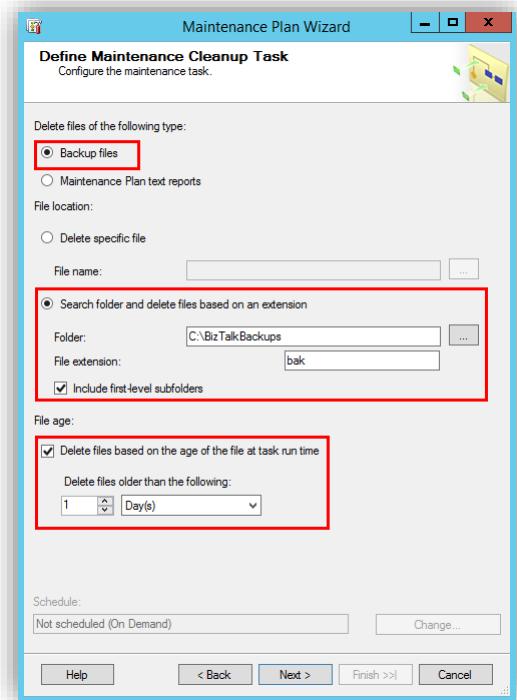
- Under Schedule, click “Change...”
  - Under “Frequency”, on the “Occurs” list, select “Daily” and in the “Recur every” box, enter how often the job schedule repeats in days: 1 Day.
  - Under “Daily frequency”, select “Occurs once at” and specific the time of day when the job schedule should run: 12:00:00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



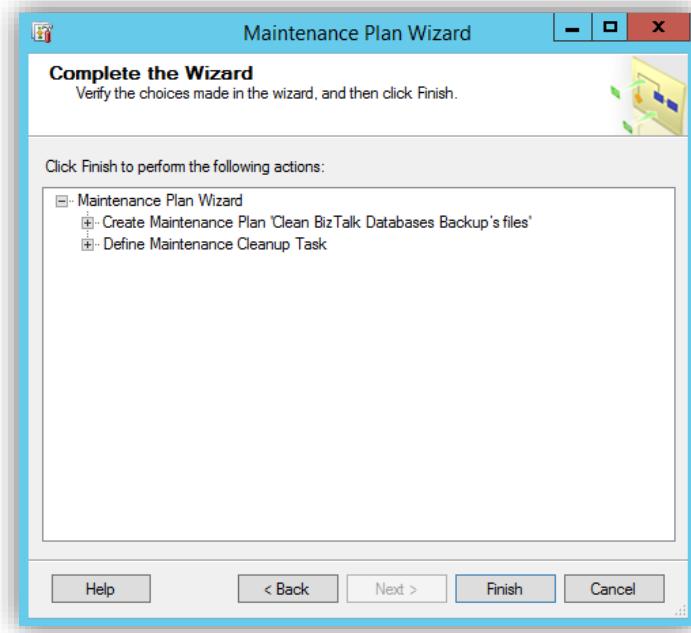
- Back to the Select Plan Properties page, click “Next”
- On the “Select Maintenance Tasks” page, select “Maintenance Cleanup Task” from the list and click “Next”



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

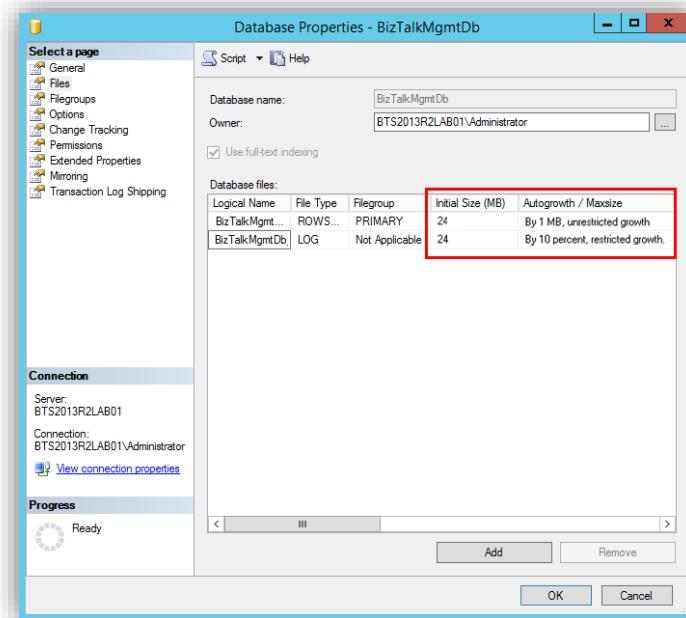


- On the Maintenance Wizard Progress page, verify if every action where successful executed and then click “Close”

## 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 for database file
- And by 10% 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.

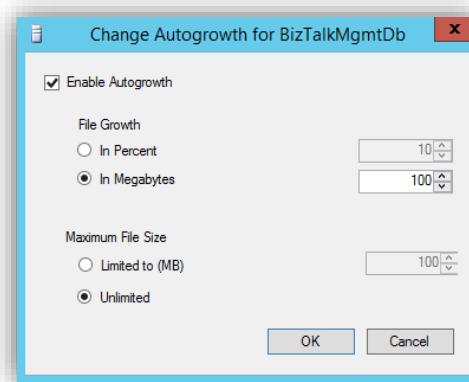
Therefore it's recommended to:

- Set this value (databases auto-growth) to a fixed value of megabytes instead of to a percentage, so SQL server doesn't waste 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 so that, 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 your 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 set automatically 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 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](#)

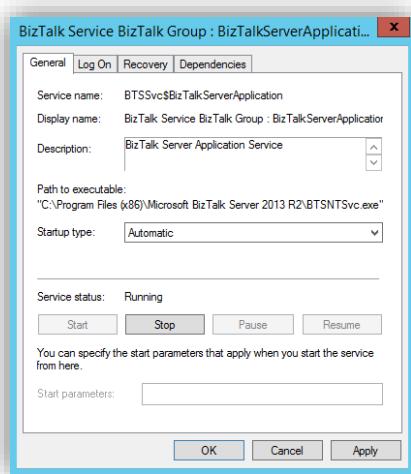
## Configure BizTalk Server Windows Services

By default, the “Startup type” propriety of BizTalk Windows Services, Enterprise Single Sign-On Service, Microsoft UDDI Notification Service and the BAMAlerts 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:

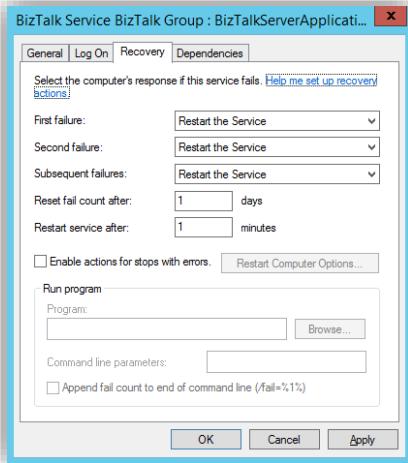
- BAMAlerts
- Microsoft UDDI Notification Service
- Rule Engine Update Service

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

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

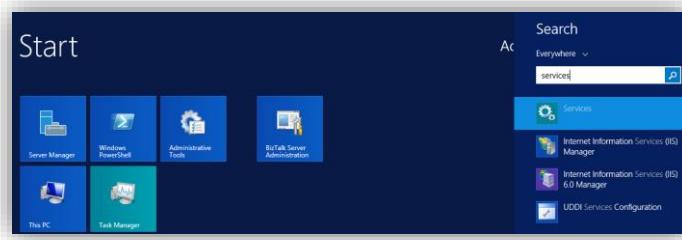


Despite being configured as “Automatic”, the Recovery properties are configured properly to restart the service after failures

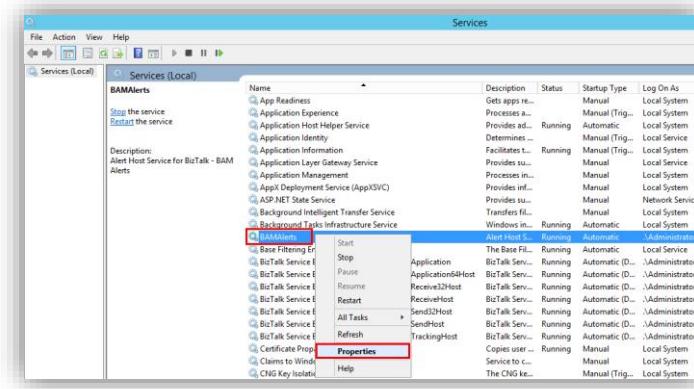


To properly configure the BizTalk Services, “Enterprise Single Sign-On Service”, “BAMAlerts” and “Microsoft UDDI Notification Service” Windows service:

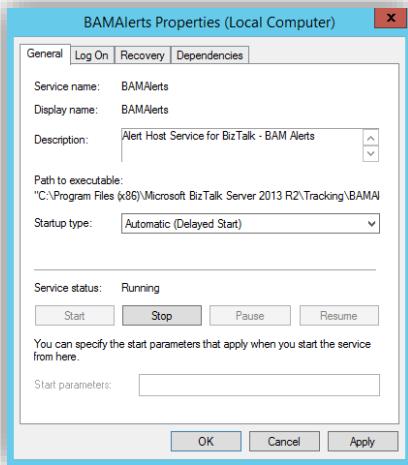
- Press the “Windows key” to switch to the Start screen, type “Services” and click in “View local services” option from the Search menu.



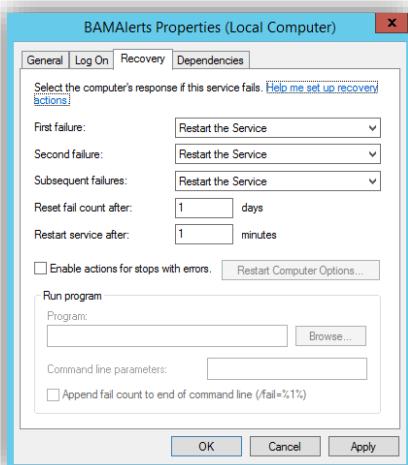
- In the Services window, on the Services (Local) panel select the service for example “BAMAlerts”, right click and select “Properties” option.



- 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

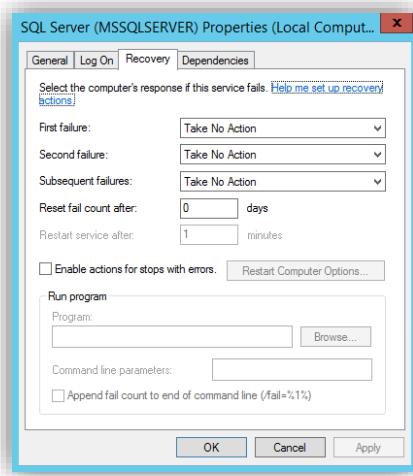


- Click “OK” to apply the changes and close the window
- Repeat the steps for the other services.

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

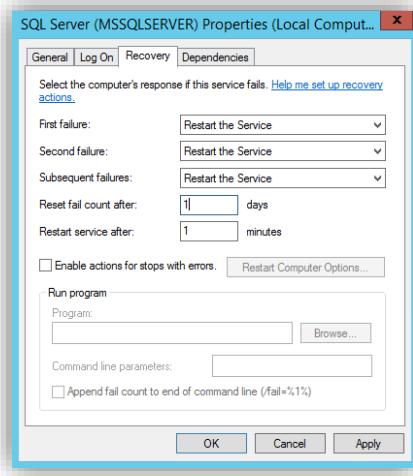
- SQL Full-text Filter Daemon Launcher
- SQL Server
- SQL Server Agent
- SQL Server Analysis Services
- SQL Server Browser
- SQL Server Integration Services 12.0
- SQL Server Reporting Services
- SQL Server VSS Writer

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 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 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](#)

Prerequisites:

- BizTalk Server 2010, 2013 or 2013 R2 should be installed and configured.

## How to register BizTalk Health Monitor Snap-In

After you download and unzip the BHM.ZIP file from the Microsoft Download Center, you need to use the “InstallUtil.exe” (older versions) or the “BHMSetup.exe” (latest versions) which comes with BizTalk Health Monitor tool to register the BHM snap in.

**IMPORTANT NOTE:** You shouldn't replace or create a new BHM folder under “C:\Program Files (x86)\Microsoft BizTalk Server 2013 R2\SDK\Utilities\Support Tools” otherwise you will have issues installing BizTalk cumulative updates (see [BizTalk 2013 R2 CU1 install failing with “Package does not contain compatible branch patch”](#))

**IMPORTANT NOTE:** Unzip the BHM.ZIP to a final destination before you register the snap-in for example: “C:\Program Files (x86)\Microsoft BizTalk Server Support Tools\BHMv3.1”. Once you register the BizTalk Health Monitor Snap-In you cannot delete the folder or BHM will stop working.

**Note:** New versions of the BHM snap-in (version 3.1) don't include anymore the “InstallUtil.exe” file

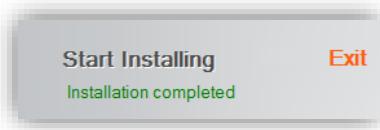
- You can still use the old “InstallUtil.exe” file to register the snap-in (but you need to copy this file to the BHM folder – see [Installing the new BizTalk Health Monitor snap-in on Biztalk Server 2010 or BizTalk Server 2013](#))
- But instead you should use now the “BHMSetup.exe” file which will register in a simpler way the snap-in (see [BizTalk Health Monitor v3.1 released!](#))

To accomplish that we need to:

- Navigate to the directory file where you unzipped the BHM.ZIP file
  - For example: C:\Program Files (x86)\Microsoft BizTalk Server Support Tools\BHMv3.1
- Launch “BHMSetup.exe” as an administrator
- Under Options you can:
  - Change the installation location of BHM
  - Choose to create a shortcut of BHM on the desktop
  - Choose to launch BHM after the setup is completed
  - Choose to include BizTalk Administration Console in BHM MMC.
    - Note, that this doesn't replace the existing BizTalk Administration Console. In order to integrate the BizTalk Admin Console with BHM in BizTalk 2010, see [HOW TO INTEGRATE BHM SNAP-IN INTO BIZTALK ADMIN CONSOLE](#) section.



- Click on “Start Installing” to begin the installation. You will get a message when installation gets completed. It shouldn’t take more than few seconds.



## 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.

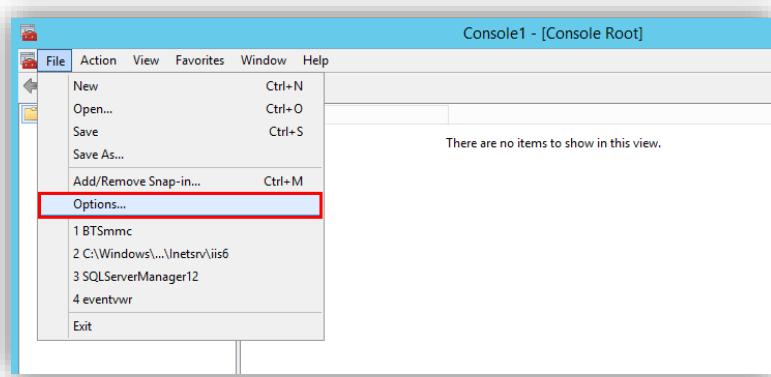
To be easier and more convenience for BizTalk Administrators BHM Snap-In can also be integrate it so that it can be used with BizTalk Administration Console.

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

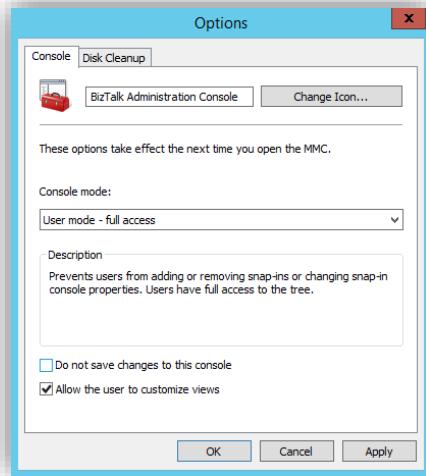
- Press the “Windows key” to switch to the Start screen, type “mmc /32” and right-click in “mmc /32” option from the Search menu and select “Run as administrator” option:
  - mmc /32



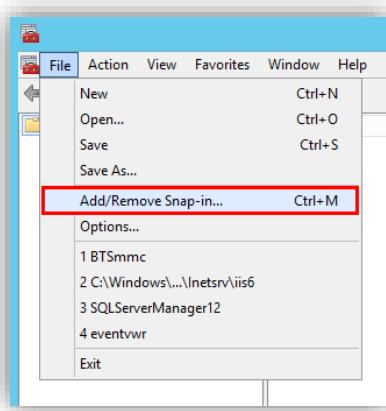
- This will open a new 32-bit version of MMC (MMC32).
- From MMC console, go to File menu and select “Options...” option



- 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 uncheck

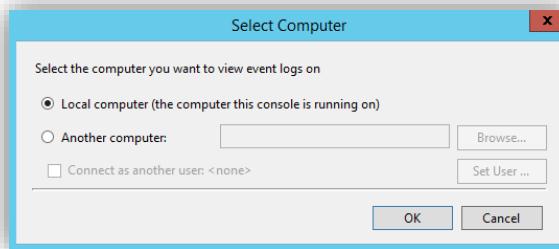


- From MMC console, go to File menu and select “Add/Remove Snap-in...” option

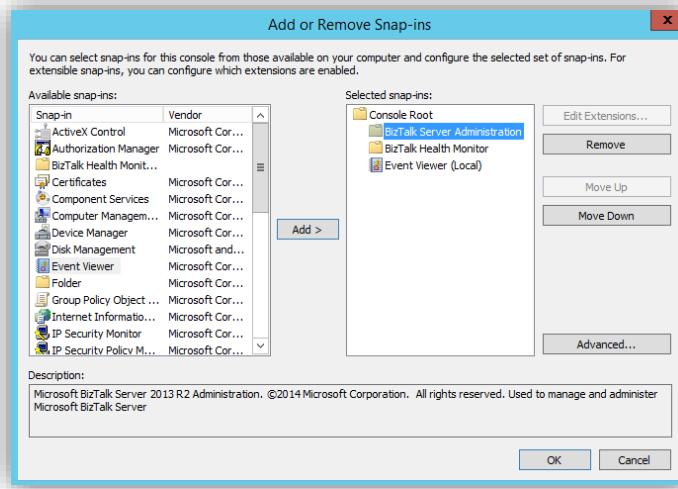


- From the “Add or Remove Snap-ins” window, add following snap-ins and then click Ok

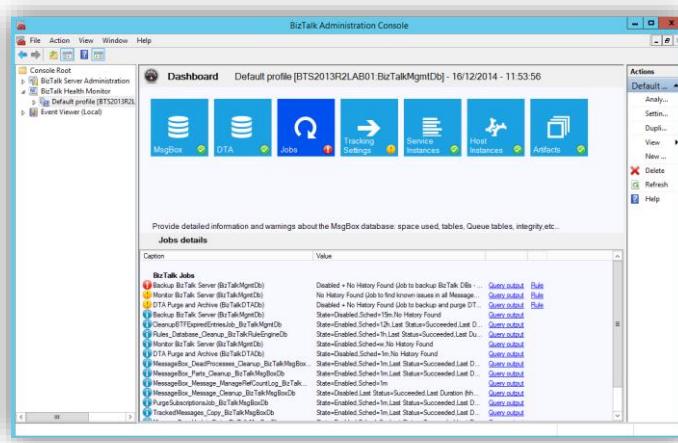
- Microsoft BizTalk Server Administration
- BizTalk Health Monitor
- Event Viewer
  - It will open a new window and you should select “Local Computer” option



- You can add the snap-ins by selecting them from the “Available snap-ins” list and click “Add >”
- Is recommend 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 2013 R2
- And rename “BTSSmmc.msc” file, for example: “BTSSmmc-old.msc”

This because we will save the “new” BizTalk Administration Console as “BTSSmmc.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 2013 R2
    - Save the file as “BTSSmmc.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

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 tool that we normally use for archiving this is a custom tool original created by [Richard Seroter](#), the: [SSO Config Data Store Tool](#).

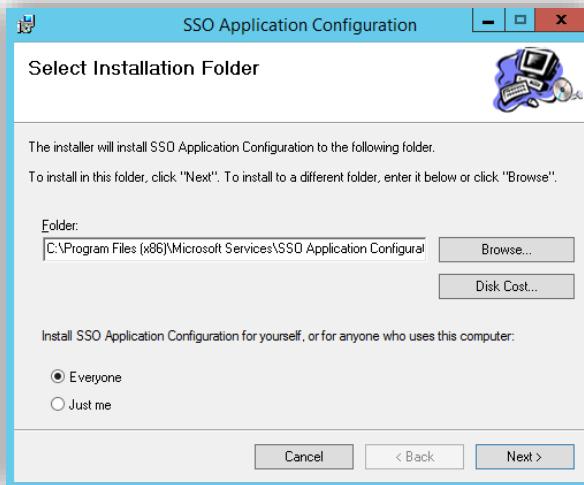
However since 2009 that Microsoft released a MMC snap-in to tackle this exact issue: [SSO Configuration Application MMC Snap-In](#) provides the ability to add and manage applications, add and manage key value pairs in the SSO database, as well as import and export configuration applications so that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

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

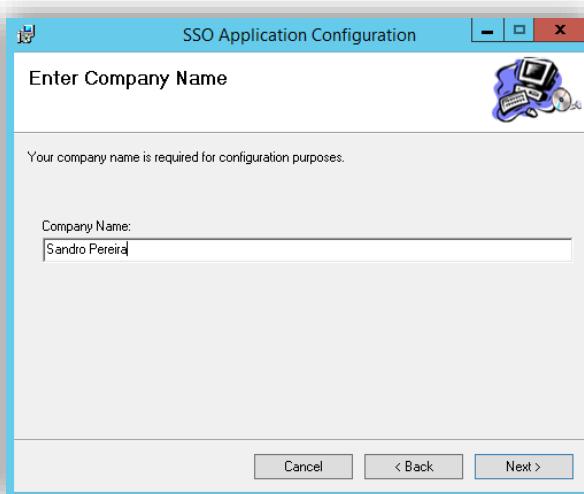
- Unzip the SSOCConfigurationMMCSnapIn.zip file available in Microsoft page.
- This file is composed by three zip files, so after unzip the first file you should unzip also the SSOMMCSnapInSetup.zip file.
- Run as Administrator the setup.exe or SSOMMCSnapInSetup.msi file
- In the Welcome to the SSO Application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



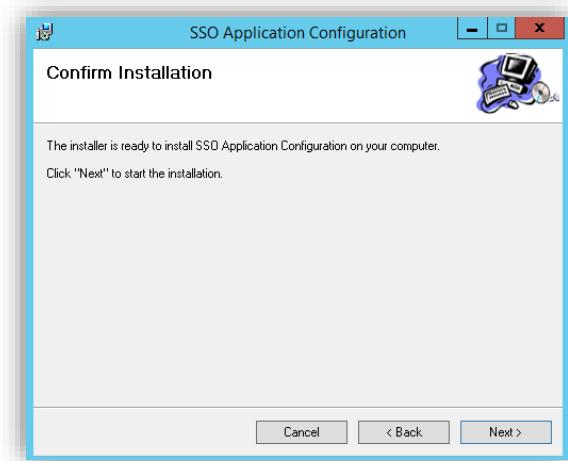
- In the Select Installation Folder page:
  - Accept the default installation folder or set another one
  - In the “Install SSO Application for yourself, or for anyone who uses this computer” option, select “Everyone”
  - And click “Next”



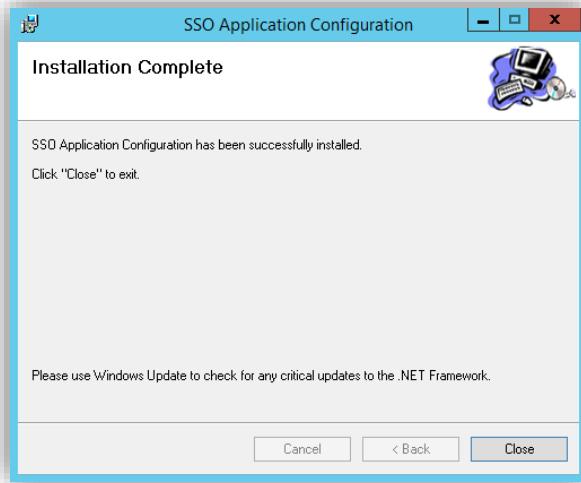
- In the Enter Company Name page, enter the name of your company and click "Next"



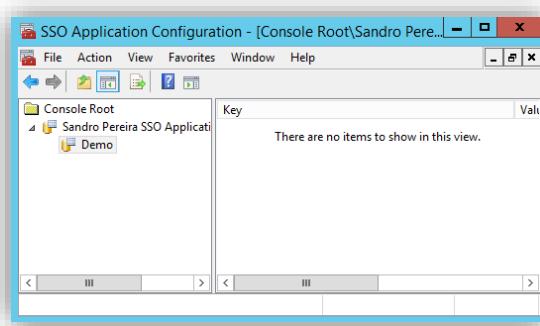
- In the Confirm Installation page, click "Next" to install the SSO Application Configuration MMC Snap-In



- In the installation Complete page, click "Close"

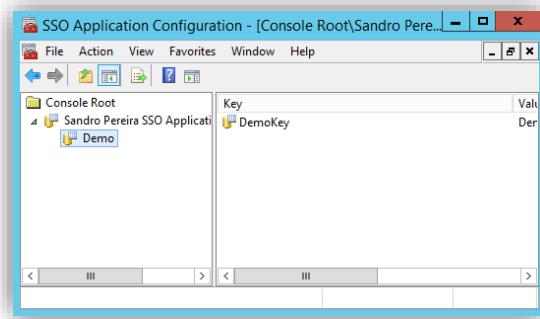


However unfortunately this tool will not work properly in BizTalk Server 2013 R2, at least running in Windows Server 2012 R2. At the first sight it seems that everything is working properly but when you try to create a key value pair you will see that nothing happens and no key is created:



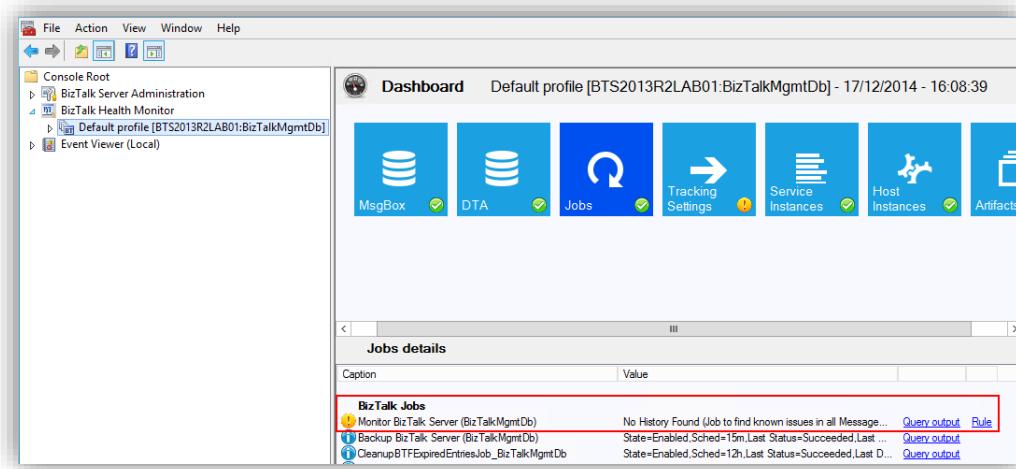
To fix this issue I recompile the SSOMMCSnapIn.dll using the latest version of "Microsoft.EnterpriseSingleSignOn.Interop.dll" available with BizTalk Server 2013 R2 that you can download at Microsoft TechNet Gallery: [BizTalk Server 2013 R2: Fix for SSO Configuration Application MMC Snap-In](#)

To solve the issue you just need to overlap the existing SSOMMCSnapIn.dll file, normally present in "C:\Program Files\Common Files\Enterprise Single Sign-On" folder with this version of the file. Now if you try to add a new key value pair everything will work fine.



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

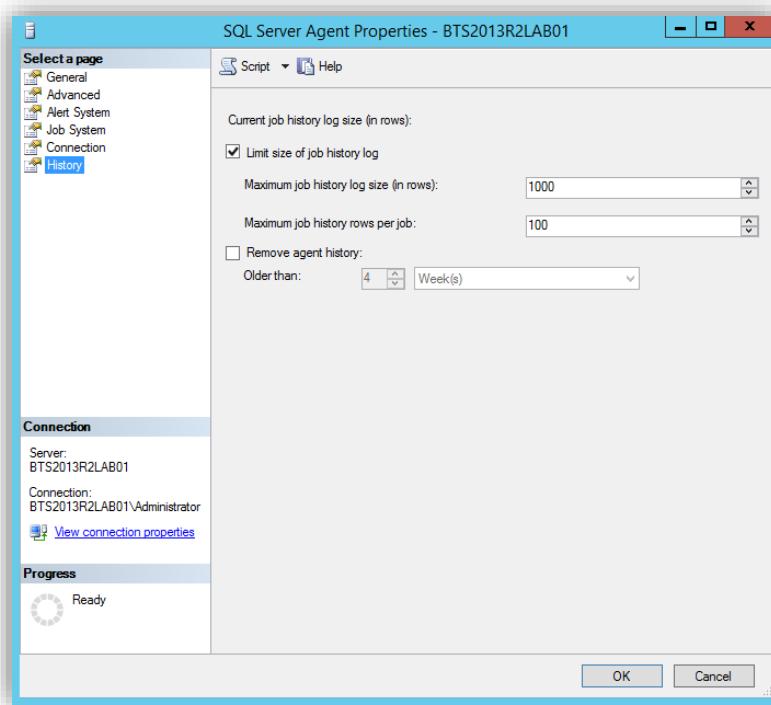
Have you ever notice that you never have present a log history of the Monitor BizTalk Server job?



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 25x 7 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

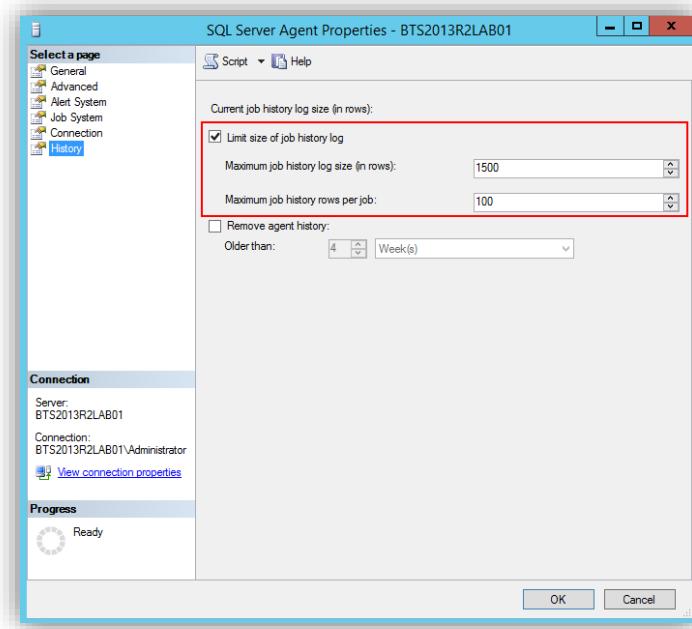


Which means that a few minutes after the Monitor BizTalk Server job run successfully or unsuccessfully, it's historic is overwritten with the row log historical of the remaining 12 jobs. Therefore never expected to have this historic job on Monday when you arrive to the office.

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).

## Force Full Backup BizTalk Server (BizTalkMgmtDb) job

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 that perform important functions to keep your servers operational and healthy.

Like any other system, all BizTalk Server databases should be backed up and BizTalk Server will provide out-of-the-box a job for accomplished that: Backup BizTalk Server (BizTalkMgmtDb) job.

This job makes both Full and Log backups. By default the Backup BizTalk Server job performs a full backup once a day and performs log backups every 15 minutes. This means that once the full backup is performed you need to wait 24 hours for it to automatically do another full backup of the BizTalk Server databases... even if you try to manually run the job, it will only make the backups of the log files.

But sometimes we need, for several reasons, to have the ability and the possibility to force a full backup:

- We will have some maintaining plan on the server, or apply a new configuration, and we want to backup the environment
- Or simple we will install a new integration application and again we want to have a backup in this exact moment

Each company have its policies, so again for several reasons, we sometimes need to force a full backup of all BizTalk Server databases.

The standard way is to use the “BizTalkMgmtDb.dbo.sp\_ForceFullBackup” stored procedure. However, and unlike what many people think, this stored procedure does not perform a full backup it only marks internally on BizTalk Server databases that the next time the Backup BizTalk Server job runs it will need to perform a full backup of the data and log files.

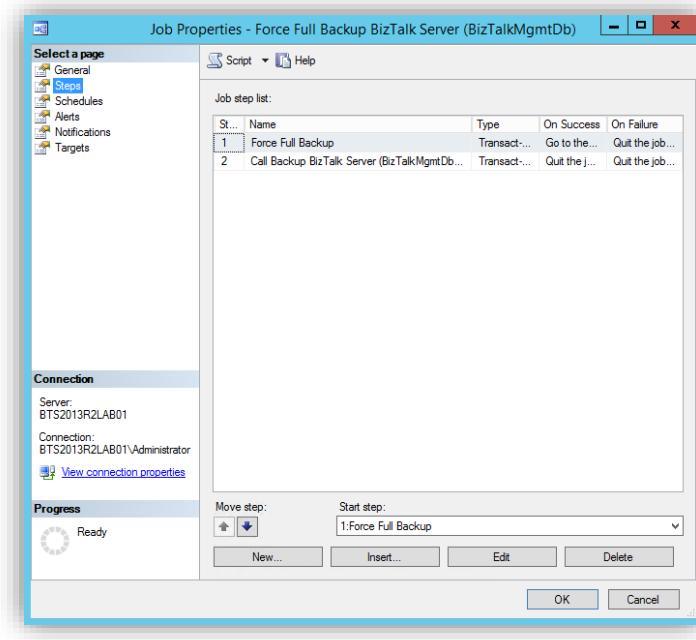
All BizTalk Admins know this (if they don't know, they should!), however sometimes we need to really on DBA Admins to perform this task, and do not misunderstand me, I have nothing against DBA! All the BizTalk Administration team should be composed by several elements with different skills: DBA Admins, network admins, Sys Admins and a BizTalk Admins... each playing its role. But sometimes DBA don't really understand the BizTalk infrastructure and BizTalk Administrator should have an important role advising and helping them (like in other situations it will be the opposite).

And because this is not a day by day task people tend to forget all the steps and sometimes they will create custom scripts to perform this task, but you really need to be aware of two important things:

- **The Backup BizTalk Server job is the only supported method for backing up the BizTalk Server databases.** Use of SQL Server jobs to back up the BizTalk Server databases in a production environment is not supported.
- **You can use the SQL Server methods to backup the BizTalk Server databases only if the SQL Server service is stopped and if all BizTalk Server processes are stopped.**

So to help one of my DBA teams I end up creating this job that is composed by two steps:

- **Step 1: Force Full Backup**
  - That will call the “BizTalkMgmtDb.dbo.sp\_ForceFullBackup” stored procedure
- **Step 2: Backup BizTalk Server**
  - That will call the standard Backup BizTalk Server (BizTalkMgmtDb) job



**NOTE:** Of course this custom job should be disabled and manually executed when you need it!

You can download the custom “Force Full Backup BizTalk Server (BizTalkMgmtDb)” Job from Microsoft | TechNet Gallery: [Force Full Backup BizTalk Server \(BizTalkMgmtDb\) Job](#)

## Managing and cleaning BizTalk Server MarkLog database tables

All the BizTalk database which is being backed up by the ‘Backup BizTalk Server’ job, so all databases with the exception of the BAM Star Schema database (BAMStarSchema), has one 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>

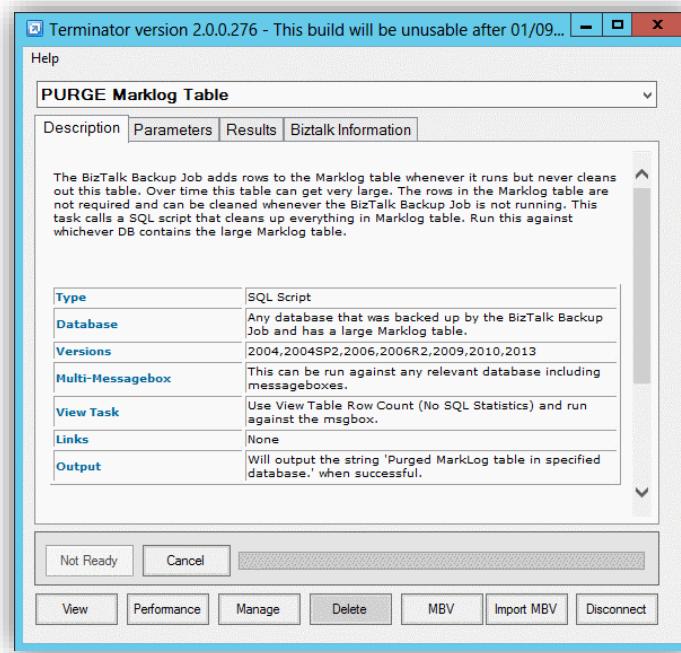
Where:

- “**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 (that now is included in the BizTalk Health Monitor snap-in) 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 practices!

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

***Is this 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 practices: 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 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;
- And I didn't want to have to places to define the @DaysToKeep and I didn't want to make unnecessary joins or additional selects

So I end 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_GetRemoteServerNameFailed
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 + '].[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

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](#)

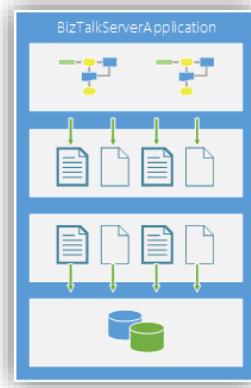
## Configure host and Host instances

One of the task that we need to do in all our new BizTalk environment 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 WSHhttp) 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's is Host, Host Instances and Adapter Handlers?

The 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:

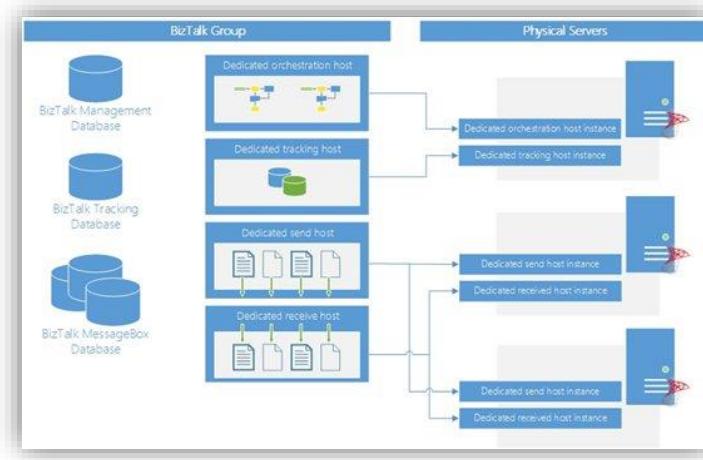
- Only one instance of a specific host can exist on each server.
- You can map one host to multiple servers.

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 is not intended to be the best practices. 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 Host if you want to separate process base in 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 2013 R2 (and also 2013) in TechNet Gallery: [PowerShell to Configure BizTalk Server 2013/2013 R2 Host and Host Instances](http://technet.microsoft.com/en-us/library/aa560166.aspx)

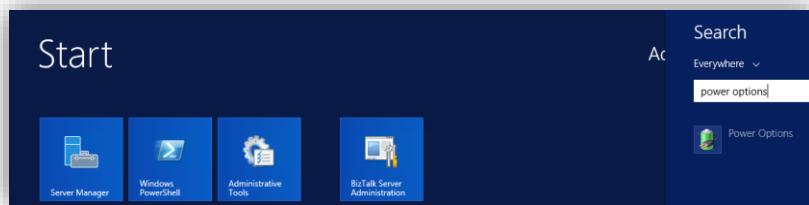
## Power Mode

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.

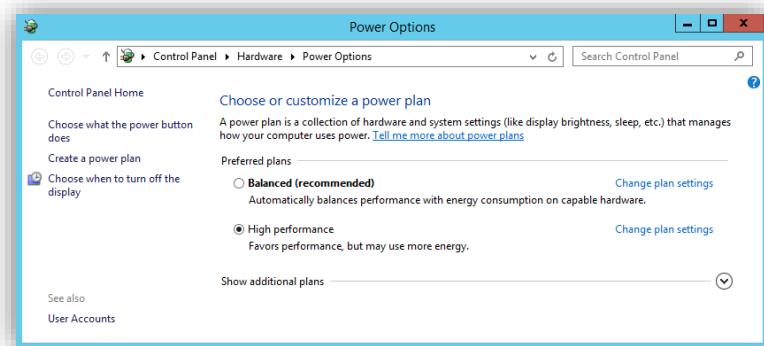
In some cases you may experience degraded overall performance on a machine when running with the default (Balanced) power plan. The issue may occur irrespective of platform and may be exhibited on both native and virtual environments. The degraded performance may increase the average response time for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

To change a power plan:

- Press the “Windows key” to switch to the Start screen and type “Power Options” and click in “Power Options” option from the Search menu.



- 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

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'
```

## General network TCP settings that can impact BizTalk Server

This part of the article will focus on configuring TCP setting on BizTalk server and the SQL server machines that can impact BizTalk Server and that can prevent from occurring general network errors.

When I was analyzing my BizTalk environment with BizTalk Server Best Practice Analyser tool, has appeared a warning that caught my attention:

Privilege Attribute Certificate (PAC) Signature Validation is Enabled on Server BTS2010LAB01. On server BTS2010LAB01, Privilege Attribute Certificate (PAC) signature is enabled, which may cause some user-authentication delay

And led me to go deeper in trying to see what was causing this strange issue and I found a number of TCP settings that needs to be done (or is recommended) which can also prevent from occurring general network errors on BizTalk Server Environments.

In the scenario described in this series of articles we should apply the following TCP/IP settings:

- Disable the Scalable Networking Pack (SNP) features
  - This needs to be done on the BizTalk Server and the SQL Server

- Disable Privilege Attribute Certificate (PAC)
  - This needs to be done on the BizTalk Server and the SQL Server

Check and if necessary increase the ephemeral ports and reduce the TCP re-use timeout setting

- This needs to be done only on the BizTalk Server

### How to Disable the Scalable Networking Pack (SNP) features

Scalable Networking Pack (SNP) be used, under specific circumstances, to improve network performance, however, most environments do not have SNP capable network adapters/drivers. This can result in unexpected network problem which is why it is recommended to disable SNP unless a server can benefit from it.

To disable SNP features we need to:

- Disable TCP Chimney Offload in the operating system
  - Use administrative credentials to open a command prompt.
  - At the command prompt, type the following command, and then press ENTER:
    - netsh int tcp set global chimney=disabled
- Disable RSS in the operating system
  - Use administrative credentials to open a command prompt.
  - At the command prompt, type the following command, and then press ENTER:
    - netsh int tcp set global rss=disabled
- Disable NetDMA in the operating system
  - Click Start, click Run, type regedit, and then click OK.
  - Locate the following registry subkey, and then click it:  
HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters
  - Double-click the EnableTCPA registry entry.
    - **Note:** If this registry entry does not exist, right-click Parameters, point to New, click DWORD Value, type EnableTCPA, and then press ENTER.
  - To disable NetDMA, type 0 in the Value data box, and then click OK.

To determine the current status of SNP features, follow these steps:

- Use administrative credentials to open a command prompt.
- At the command prompt, type the following command, and then press ENTER:
  - netsh int tcp show global

**Note:** you need to restart the computer first.

### How to Disable Privilege Attribute Certificate (PAC)

The Privilege Attribute Certificate (PAC) is a function invoked within the Windows security system when you log on to a system utilizing Kerberos. It is a network authentication protocol.

The Kerberos Privilege Attribute Certificate (PAC) contains all of the group memberships for the security principal requesting access to a resource. PAC validation means a more secure environment so why should be disabled?

When you run a high-volume server program on a domain member that uses Kerberos to authenticate users, you experience a delay in the user-authentication process. Additionally, you notice an increase in the remote procedure call (RPC) traffic between the domain controller that uses the Net Logon RPC interface and the server. This problem occurs because the Kerberos client verifies the Privilege Attribute Certificate (PAC) signature in the Kerberos ticket

by using the domain controller. The Kerberos client performs this verification to prevent PAC spoofing. The increased network traffic is generated by the RPC requests that are part of this verification process.

To disable PAC we need to:

- Click Start, click Run, type regedit, and then click OK.
- Locate the following registry subkey, and then click it:  
HKEY\_LOCAL\_MACHINE\SYSTEM\CurrentControlSet\Control\Lsa\Kerberos\Parameters
- Add the following registry entry
  - Right-click Parameters, point to New, click DWORD Value, type ValidateKdcPacSignature, and then press ENTER.
- To disable PAC, double-click the ValidateKdcPacSignature registry entry and type 0 in the Value data box, and then click OK

#### How to Check and if necessary increase the ephemeral ports and reduce the TCP re-use timeout setting

When a client initiates a TCP/IP socket connection to a server, the client typically connects to a specific port on the server and requests that the server responds to the client over an ephemeral, or short lived, TCP or UDP port.

Under certain conditions it is possible that the available ports in the default range will be exhausted. If this occurs the following symptoms may be observed:

- Client applications may fail to connect to the BizTalk Server.
- The BizTalk Application service may fail to connect to a remote SQL Server.
- BizTalk Server adapters may fail to connect to a remote server.

To verify that one or more client applications are not generating excessive TCP/IP socket connections perform the following on the BizTalk servers in the group:

- From a command prompt window execute “netstat -ano -p tcp”.
- Count the number of unique Local Address TCP ports open above 1024 for each IP address.

If less than 3000 ephemeral ports are currently in use, then it's fine. (Original source: Recommended Platform Configuration for BizTalk Server by Abdul Rafay)

You can check or modify these settings at the HKLM\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters registry key. The recommended values are:

- Registry name: MaxUserPort (*This key is all pre-Vista behaviour, applicable from NT4 through to Windows Server 2003*)
  - Value: 0xFFFF (65534)
  - Comment: Prevents port exhaustion
- Registry name: TcpTimedWaitDelay
  - Value: 0x1E (30)
  - Comment: Release unused ports as quickly as possible

Or you can view the dynamic port range by using the following netsh commands:

- netsh int ipv4 show dynamicport tcp
- netsh int ipv4 show dynamicport udp

On all BizTalk servers running on Windows Server 2008, there are 16383 ports (port 49152 to port 65535) and it is around 4 times more ports than the default ports number in Windows Server 2003. Microsoft recommend that you only increase the ephemeral ports if the default range is not enough. However, if you determine that additional dynamic ports are needed you can also use netsh command to modify these settings, as follows:

- `netsh int <ipv4|ipv6> set dynamic <tcp|udp> start=number num=range`

This command sets the dynamic port range for TCP. The start port is number, and the total number of ports is range. Example:

- `netsh int ipv4 set dynamicport tcp start=10000 num=1000`

These sample commands set the dynamic port range to start at port 10000 and to end at port 11000 (1000 ports).

**Important notes:**

- The minimum range of ports that can be set is 255.
- The minimum starting port that can be set is 1025.
- The maximum end port (based on the range being configured) cannot exceed 65535.

See [Microsoft Help and Support](#)

**At the end you should restart BizTalk and SQL Servers.**

## Author



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He is an active member and moderator on the MSDN BizTalk Server Forums, Code Gallery contributor and was awarded Most Valuable Professional (MVP) for BizTalk Server by Microsoft since 2010 (<https://mvp.support.microsoft.com/profile/Sandro.Pereira>).

He is also author of the Blog: <http://sandroaspbiztalkblog.wordpress.com/>, member of the BizTalk Brazil community: <http://www.biztalkbrasil.com.br/>

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