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How to Use This Guide

Overview

These instructions will guide you through a complete standard XA Server Setup using Windows Authentication mode. Please consult HealthCast if you are interested in an alternative method.

These instructions are also valuable tools in troubleshooting possible server problems. For troubleshooting, use the checklist section to ensure that the two XA Servers have been correctly configured. The source of a problem may be quickly identified by reviewing the high-level steps in the checklist sections to confirm that they have been properly followed.

DO ALL STEPS IN THE ORDER THEY APPEAR HERE.

Start with a clean server or server image to ensure all software is optimally configured.

1. Install a supported Windows Server Operating System
2. Load Balance the two XA Servers
3. Install a supported SQL Server
4. Install XA Server
5. Configure failover
6. Configure replication
7. Test the entire setup to ensure it is functioning as intended

In this configuration, XA and SQL will be installed on the same server. For ease of use, this document reflects only the instructions for this standard configuration.

This document describes a standard two server configuration. Please be aware that there are many possible configurations that may be appropriate for your environment. Please read the eXactACCESS Server Considerations and Recommendations document below for details on this standard configuration:

(http://support.gohealthcast.com/documentation/General/PDFs/XA_Server_Client_Requirements_Q3%202010.pdf)
SQL Authentication Options

Your SQL Server environment should be configured to utilize Windows Authentication mode. If you want to evaluate the use of another server configuration, please contact your HealthCast Project Manager.
**Load Balancing Setup**

Load Balancing is a requirement for the optimum performance of XA. The load balancing system you currently have in your environment can be utilized, and should be setup in accordance with the manufacturer’s directions.

If you do not have a preferred load balancing method in place, we recommend using Network Load Balancing ("NLB") (a function of Microsoft’s Server software (Windows 2003 and above)). NLB has been proven to work well with XA. Instructions for using NLB can be found *Appendix A*.

Load balancing must be in place and tested before continuing with the XA Server Software installation.
XA Server Software Installation

Fresh Install Checklist for the Primary XA Server

☐ Check that EACH server meets the standard hardware/software requirements. Correct any deficiencies before going to the next item.
- Minimum: MS Windows 2003 Standard or Enterprise Edition (32-bit only) is installed
- Minimum: Microsoft SQL Server 2005 with SP3 is installed
- Quad-Core (single socket, 2.33 GHz or greater) processor is in the system
- 4 GB RAM is in the system
- Dual 146 GB (or greater) hard drives in a RAID 1 array (or equivalent for virtualization) are in the system
  *All 146 GB should be dedicated for the XA Solution installation and its required components.*
- 2 Ethernet Network Interface cards are in the system

Read the eXactACCESS Server Considerations and Recommendations document (link provided below) for details about our standard requirements for optimum system performance.
(http://support.gohealthcast.com/documentation/General/PDFs/XA_Server_Client_Requirements_Q3%202010.pdf)

System requirements when running in a virtual environment are different that shown above. Refer to the above document link for additional information

☐ Create and configure the group and user accounts.

Please verify that these accounts have been created. If they have not, create them. Step-by-step directions for doing this can be found in the XA Server documentation on the support site.
(http://support.gohealthcast.com/documentation/XAServer/ServerActiveDirectoryConfig.aspx)

- **XA Admins** global security group account has been created in Active Directory.
- **xaadmin** user has been created in Active Directory and the password has been recorded for future reference. Add the account to the **XA Admins** group and ensure that the password is set to never expire and that the user cannot change the password.
- **xaserver** user has been created in Active Directory and the password has been recorded for future reference. Make sure that the password for the user is set to never expire.
- Add the **xaserver** user to the **Local Administrators** group on the server you are setting up.

Note: To complete the install and configuration you need to use an account that is a member of the local administrators group and a member of the XA Admins group, however that is accomplished.

☐ UAC should be disabled on the server (if available).

We recommend that you turn off the User Account Control (UAC) before installing XA Server. For more information please read the FAQs—**Why should I turn of UAC?**
If you choose to leave UAC on, please enter appropriate administrator credentials and allow XA Server, and its components, access to install when prompted. You should run each executable, the Registry Editor, and the Command Prompt as an administrator (right-click on the .exe or shortcut and select **Run as Administrator**).
Run the XA Server Install
Download the exactACCESS Server file from the following link:
http://support.gohealthcast.com/installs
Directions for the install can be found in the online documentation on the support site.
  □ Select "No, I want to restart my computer later" and click Finish.

Enable the desired XA Server Services
This installation of exactACCESS server includes services for the following features:
  □ exactACCESS Server services (SSO) [HCI exactACCESS Server]
  □ auditSERVER services [HCI auditSERVER Service]
  □ ProxCard Server services [HCI ProxCard Server]
  □ Remote Authentication/Session Directory services [HCI Remote Authentication Server]
  □ Deployment Services [HCI Deploy Service]

Configure the Services to run under a domain account
If using an LDAP provider (Either LDAP or LDAP + Global Catalog) or you are using a network share for the configuration XML files, the HCI exactACCESS Server must be configured with a domain account.

If using NT Integrated Security for MS-SQL for any of the following server functions, then each service must be configured with a domain account.
  □ exactACCESS Server services (SSO) [HCI exactACCESS Server]
  □ auditSERVER services [HCI auditSERVER Service]
  □ ProxCard Server services [HCI ProxCard Server]
  □ Deployment Services [HCI Deploy Service]

Create a new registry key to correctly set the order in which services should start.
HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HCeXactACCESSServer
  DependOnService (key), REG_MULTI_SZ (Multi-String Value type), MSSQLSERVER(value)
Directions for changing the registry can be in the online documentation on the support site.

The registry change is required because XA and SQL are installed on the same server in this set-up.
http://support.gohealthcast.com/documentation/XAServer/UpdateRegistryKey.aspx
  □ Use the Registry Editor to add this key.
  □ Once you have created the key, Restart computer.

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\HCAuditServerService
  DependOnService (key), REG_MULTI_SZ (Multi-String Value type), MSSQLSERVER(value)

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hchidserverservice
  DependOnService (key), REG_MULTI_SZ (Multi-String Value type), MSSQLSERVER(value)

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\hcideployservice
  DependOnService (key), REG_MULTI_SZ (Multi-String Value type), MSSQLSERVER(value)

Create and configure the XA database.
Directions for creating and configuring the database can be found on the support site.
http://support.gohealthcast.com/documentation/XAServer/ServerCreateXAdb.aspx
  □ Create the XA database with name xadb.
(Continued on the next page...)
Execute the **XADB_4_5SP2.sql** SQL script. 
This file is included in the **XA Server** release installation package and will appear under a folder indicating the database server format each of the scripts supports.

Add the **xaserver** domain user account as a new login to the Security→Logins area of the SQL Server Management Studio tool.

Once the user has been created, select **User mapping** and give the user permissions to read and write, on the **xdb** database by right clicking on the **XA database** and select Properties and then ‘User Mapping’ on the left hand pane. You can also select the db roles that you want applied to the xa user for this database.

Note: If the user is already a member of the local Administrators group on the SQL Server that user should already have permissions in excess of what is required to ensure proper operation of XA.

Optional: Repeat the DB creation steps above for the ProxCard Server - HCProxCardScript.sql

Optional: Repeat the DB creation steps above for the auditSERVER - database.sql

Optional: Repeat the DB creation steps above for the HCIDeploy Server - MSSQL_2005.sql

Optional: Configure the Remote Authentication (Session Directory) access location with appropriate NT Security.

The default install path for the HasAccess.txt file is:

C:\Program Files\HealthCast\eXactACCESS\SessionDir

The location where this file resides can be changed if necessary (due to UAC requirements).

Copy the file to a new location and update the following registry key: HKEY_LOCAL_MACHINE\Software\HealthCast\HCCitrixSessionDirectory

SecuredFileLocation: reg_sz = <enter the new path in this value>

Alternatively, use the configuration tool to update the location.

Run the Server Configuration tool

- Start the Server Configuration tool to adjust settings.
- Setup database connection to the databases.
- Configure the Directory Service domains for the XA Server
- Any other desired changes can be completed here with the exception of choosing an XA Administrative group.
- Configure the database connection(s) for each of the following:
  - ProxCard Server
  - auditSERVER
  - HCIDeployServer

Create a network share for the XA Server XML configuration files.

- Create a network share at a different location than the XA Servers and document the share name and location.
This share should be highly accessible and available to both primary and secondary XA Servers. This share will contain critical server XML files that will be used by both XA Servers. Give the xaserver user full (read, change) permission on the share.

(Continued on the next page...)

The eXactACCESS Server service access requires access to this share. And it is critical that the xaserver user account, which the eXactACCESS Server service is running under, be granted read and write access to it.

- Navigate to C:\Program Files\HealthCast\eXactACCESS\sharedConfig on your XA Server.

- Copy the Server.xml and SERVERSTATUS.XML files that are located there, and paste them into the network share created above.

Restart the Server

- The server is restarted here to ensure that all services are started correctly, and that all dependencies have been met. If the server is not restarted, the remaining steps may not complete correctly.

Run the Server Configuration tool

- Start the Server Configuration tool to adjust settings.
- Set the Administrative group to use for XA Administrators
- Save your settings, and allow the XA Server Service to be restarted.

Test your installation

- Login to the server using the xaadmin user account you created above and then double-click on the XA desktop icon. The XA desktop will appear if the installation has been successfully completed.
- Click the eXactACCESS Administrator link on your XA Desktop. On Windows 2008 systems, this must be done before re-enabling UAC.

If you have not turned UAC off, then you must navigate to the HealthCast\eXactACCESS folder in on your server and run the XAManager.exe, for the first time, as an administrator (with elevated permissions)

Re-enable UAC if it is available and previously disabled

- Configure UAC to return the server to its protected state
Fresh Install Checklist for the Secondary XA Server

The secondary XA Server will mirror the primary XA Server. The steps in the Fresh Install Checklist for the Primary XA Server should be repeated on the secondary server. The only deviations for the secondary server setup are as follows:

1. You do not need to create the Active Directory accounts twice. In that section, you will only need to follow the last step; adding the xaserver user as a Local Administrator on the secondary server.

2. You do not need to create another network share for the server XML configuration files.

All other steps and instructions listed in the Fresh Install Checklist for the Primary XA Server should be followed on the secondary XA Server, including a final test of the installation.
**XA Failover Configuration**

**Failover Configuration Checklist**

The recommended configuration for XA is shown below. Based on this configuration, XA provides failover via the primary and secondary datastrings configured in each server. Please follow the instructions below to configure the datastrings to provide failover.

- □ Using the configuration tool, enter a primary and secondary database connection
  - □ Click the add button to add a second database connection string.
  - □ Fill in the information to connect to the secondary server.

*Figure 1: Failover Diagram*
Replication Setup Checklist

We recommend Replication be enabled and configured for your XA server configuration. Please use the Replication instructions found in Appendix B: Replication to setup the replication in your environment. Please make sure you follow these high-level steps in this order.

- Agent XPs must be enabled in SQL Server BEFORE beginning the replication configuration. Special script is included in Appendix B of this document. Start SQL Server Agent on both servers before configuring replication.

- The domain user who is the authorized SQL Service user must be an administrator on both machines and will be used for the replication process.

- Meet all dependencies before configuring replication.
  - Shared folder for data (shared “ReplData” folder)
    The ReplData folder should be saved in a location with approximately 100 GB of space available and minimal activity. Make the folder highly visible in the directory (like in the root of the D:\ drive as an example. Test this share by logging in with the SQL Service AD user (xaserver) to make certain that it is available, working, and read/write permissions are in place. This MUST be done before configuring replication.

- Create a database folder on the server chosen for distribution. RECORD THIS LOCATION. IT IS AN IMPORTANT REFERENCE FOR FUTURE TROUBLESHOOTING.

- Determine which server has the most available space for replication data. Use that server as the distribution server.

- Ensure disk space is approximately 100 GB (this is very important!) to ensure proper storage of replication data. (storage for XA, ProxCard)

- You must use SQL Server Management Studio to set up replication. The Service Manager is not an appropriate tool to use as an alternative and will not enable you to correctly set up replication.

- Configure distribution according to the Configure Distribution instructions in Appendix B.

- Create a new publication according to the Create a New Publication instructions in Appendix B.

- Create a new subscription according to the Create a New Subscription instructions in Appendix B.
Testing the Server Setup

Testing Setup Checklist

Test the setup by pointing a client PC at the load balanced IP/Name. Ensure that XA is functioning as it should be by logging in as a valid XA user account. Then, stop the XA service on the primary machine, and login again. The system should failover automatically to the second server.

You can manually check that the data from the primary server contains the same number of records that the database on the secondary server does. This ensures replication is active.

To test the setup:

- Create a test user account
  The test user should be a member of a valid XA group that is assigned to at least one application.
- Ensure that there is at least one Wrapper registered and available for that user to access
- Login to XA with the test user account from the client PC pointing to the load balanced IP/Name
- Ensure the Wrapper link is displayed appropriately
- Logoff the test user account
- Check the XA database to ensure that data is present
- Verify that data is being replicated to both servers
- Unplug or disable the network connection of the primary server and login to XA again with the test user, but this time enroll in the application
- Unplug or disable the network connection of the secondary server and login to XA again with the test user, and make sure the wrapper signs the user on (therefore proving that the data was replicated back to the primary server)
Appendix A. NLB Worksheet and Setup Instructions

NLB Setup Checklist

The recommended configuration includes NLB to load-balance the two XA servers. Please use the NLB worksheet and instructions to set up NLB in your environment.

☐ Verify that both servers meet the NLB requirements/specifications
  o They have 2 network cards/interfaces (one physical card with two interfaces on it meets this requirement)
  o 5 static IP addresses
  o Windows Server 2003 with the latest SP and updates is installed

☐ Use the NLB Worksheet in Appendix A to collect and document the appropriate IP names, and to assign them accordingly

☐ Assign an IP on the first server

☐ Manually set the interface metric to 1 on the first server

☐ Assign an IP to the second server

☐ Manually set the interface metric to 2 on the second server

☐ Create a new cluster

☐ Configure/confirm the port configuration information

☐ Add servers to the new NLB cluster

☐ Test the load balancing setup
NLB Setup Instructions

Windows Load Balancing Services (WLBS) also known as Network Load Balancing (NLB) is a function of Microsoft’s Server software. The steps below are instructions to configure the NLB abilities to work optimally with our enterprise solution software. There are many configurability options within Windows Server, this document only covers HealthCast’s recommended standard configuration.

Please talk to your HealthCast representative if you feel you have variables in your environment that are not addressed here. Your HealthCast representative will help find a solution that fits your environment.

Requirements/Specifications

- Windows Server 2003 or Windows Server 2008 with the latest service pack and updates
- 2 Network cards/interfaces (One physical card with two interfaces on it meets this requirement.)
- 5 Static IP Addresses
- NLB Worksheet (Located on the last page of this document.)

Preparation

You should locate the NLB Worksheet near the end of this document and tear-out, or print, it. This worksheet is designed to help you gather and organize the information you will need to set up NLB. Please complete the worksheet and have it available before you begin the setup process; it is referenced often in the following instructions.

Setup

Configure the Public Network Connection

Perform the following steps on the first server.

Assign IP

1. Go to Start > Control Panel then double-click Network Connections.
   1. Windows 2008, go to Start > Control Panel then select Network and Internet
   2. Then select Network and Sharing Center
   3. Then, in the left “Tasks” list, select Manage network connections
2. Right-click the Public network connection and select Properties.
3. Verify that Network Load Balancing is unselected.
4. Select Internet Protocol (TCP/IP) so it is highlighted, then click the Properties button.
5. In the Internet Protocol Properties dialog box, select Use the following IP address:
6. Enter the first static IP (IP #1 from the worksheet).
7. Enter the appropriate subnet mask.
8. Enter the appropriate data for the Default gateway, and DNS server addresses.
9. Click Advanced....
**Manually set the metric**

1. Locate the **Automatic metric** option at the bottom of the **Advanced TCP/IP Settings** dialog box.
2. Uncheck the **Automatic metric** option.
   
   *This option is normally checked as a default. If it is already clear, then leave it cleared.*
3. Set the **Interface metric** to 1.
4. Click **OK** to confirm the changes for all open dialog boxes until you have returned to the **Network Connections** screen.

**Configure the WLBS Network**

Perform the following steps on the first server.

**Assign IP**

1. Right-click the **NLB** network connection and select **Properties**
2. Verify that only **Network Load Balancing** and **TCP/IP** are selected.
   
   *This option must be selected on this network connection in order for load balancing to be utilized.*
3. Select **Internet Protocol (TCP/IP)** so it is highlighted, then click the **Properties** button.
4. In the **Internet Protocol Properties** dialog box, select **Use the following IP address:**
5. Enter the second static IP (IP #2 from the work sheet).
6. Enter the appropriate subnet mask.
7. Ensure that the **Default gateway**, and **DNS server address** spaces are clear. Clear them if they are not.
8. Click **Advanced….**

**Manually set the metric**

1. Locate the **Automatic metric** option at the bottom of the **TCP/IP Settings** tab.
2. Uncheck the **Automatic metric** option.
   
   *This option is normally checked as a default. If it is already clear, then leave it cleared.*
3. Set the **Interface metric** to 2.
4. Click the **DNS** tab.
5. Ensure the **Register this connection’s addresses in DNS** box is cleared—if it is not clear it.
6. Click **OK** to confirm the changes for all open dialog boxes until you have returned to the **Network Connections** screen.
Verify other settings:

1. In the **Network Connections** dialog box choose **Advanced** from the menu bar.
2. Select **Advanced Settings**.
3. Ensure that the **Public** connection is listed higher than the **NLB** connection. If it is not, make that adjustment by selecting Public to highlight it then clicking the green up arrow to the right until Public is above NLB.
   
   *Public should be above NLB in the list view of the dialog box.*
4. Click **OK**.

Now that the first server is configured, repeat the steps above on the second server. Assign IP#3 for the Public network connection and IP #4 for the NLB network connection. All other directions are the same.

Create a new cluster

The new cluster can be done on either server.

1. Run the **Network Load Balancing Manager**. 
   *It is located in the Start menu under Administrator Tools.*
2. From the menu bar in the **Network Load Balancing Manager**, locate **Cluster** and select **New**.
3. Enter **IP#5 Address**, from the NLB worksheet, and the subnet mask in the **Cluster Parameters** dialog box.
   
   *If you plan to use a DNS name for your XA Service (where clients will connect) you should enter it in the Full Internet name field. Make sure you register that name in your DNS servers.*
4. Select **Unicast** as the cluster operation mode.
5. Click **Next** to continue.
6. Click **Next** again.
   
   *If you would like to have multiple IPs involved with the XA Service you can enter those IP addresses here. This is not common and should be discussed with your HealthCast representative before it is configured.*
7. We recommend that you leave these settings as default. This will route traffic to all available ports on both servers. Click Next.
   Please review the notes below if you would like to configure the ports manually.

Optional Port Configuration Information

These port rules determine which ports both machines are listening to for the shared IP address. This also determines which method of load balancing is used. If these properties are set incorrectly the NLBS will either not function or one machine may become overburdened.

The following list indicates the default ports that can be set for XA and other HealthCast software.

- XA Server = TCP 15000, 15001
- ProxCard Service = TCP 30000
- auditSERVER = TCP 25000
- Remote Authentication = TCP 20000
- HCI Deploy = TCP 26000

HealthCast recommends that you leave these settings as the default. If you do not leave these in a default state you will need to define port rules for each previously listed TCP ports with a recommended affinity of single.

Add Servers to the NLB Cluster

1. In the Connect dialog box, type IP#2 in the Host box.
2. Click Connect.
   NLB should appear as the Interface name and the Interface IP should display the IP designated as the Host.
3. Click Next.
   Normally you should leave the priority in the Host Parameters dialog box as is. Change it if you know that one machine should take priority over the other.
4. Select the NLB cluster in the Network Load Balancing tool so it is highlighted.
5. Navigate to the Menu bar and select Cluster from the Menu.
6. Select Add Host from the menu.
7. Repeat the steps from above for the second server you are connecting to the NLB network for load-balancing. Use IP#4 from the NLB worksheet during step 1.
8. Verify that both machines are shown as cluster members and have a status of green and converged.
Test the Setup

The most effective way to test that your XA servers have been load balanced correctly is to run XA on both machines, then disable one (or stop activity to it through the Network Load Balancing Manager Tool). If the setup is correct, XA will continue to function as expected.

Troubleshooting

Error: No Interfaces are available for installing a new cluster
If you get this error when trying to add clients to the newly created cluster in a virtual machine environment, it is likely caused by each machine having identical network connection GUID's. This is often attributed to VM cloning or other software imaging programs.

To fix this, access one of the servers in the NLB and, via device manager, remove each network interface. Then tell the device manager to rescan for hardware changes. You will likely need to repeat the NLB configuration instructions given in this document on the newly discovered hardware.

Configuring load-balancing on production servers
The load-balancing information we have provided in this document assumes that you are setting-up servers that are dedicated for XA use and are being setup in a test or development environment—not in production. Making changes to a system that has been previously configured and is currently in use may disrupt the functions of that system and have unknown consequences to current production applications. Please carefully consider the consequences of making changes to the NLB network in this scenario.

Other References

Microsoft has extensive documentation covering NLB and its functions. Below are links to specific articles that may be helpful to you during your setup.

Basic steps and information

- How To Configure Network Load Balancing Parameters in Windows Server 2003
  http://support.microsoft.com/kb/323437
- How To Perform Basic Network Load Balancing Procedures in Windows Server 2003
  http://support.microsoft.com/kb/816111
- Install and Configure NLM (WLBS) on Windows Server 2008
- Network Load Balancing Step-by-Step Guide: Configuring Network Load Balancing with Terminal Services

Load balancing in a virtual environment

NLB Worksheet

Example of two server set-up: Server A and Server B
Public is used for general communication with the server and NLB is only for NLB operations.
All addresses need to be statically assigned.

IP Addresses, Networks, and Servers

NLBS configuration can be complex and confusing. In order to help you through the process we have created an example set of IP Address, Servers, and Networks. Please understand the IP Addresses, Network names, and Server names are only examples. When configuring your NLBS please use the name of the networks and servers that are in your environment along with the IP Addresses that correspond to them.

If you can create new IP addresses for load balancing, we recommend that you do so. It is imperative that the addresses are not currently in use, and it is preferred that they are new and have never been used in your environment before. Make sure to ping each IP Address before you use it.

Gather the network IP addresses of the two servers you will be using and record them here:

**Server A**

#1 IP—1st Network connection: (we’ve named it Public for documentation purposes):

___________________________

#2 IP—2nd Network connection: (we’ve named it NLB for documentation purposes):

___________________________

**Server B**

#3 IP—1st Network connection: (we’ve named it Public for documentation purposes):

___________________________

#4 IP—2nd Network connection: (we’ve named it NLB for documentation purposes):

___________________________

#5 IP—Generate a 5th IP address. Ensure that this address is not in use elsewhere in your network. This is the address that you will use to identify the NLB sub-net (often referred to as a cluster). It will be needed for this set-up and for configuring XA Client software. ____ . _____. _____

At least three of these five will be assigned to the NLB network connection in our example. One of those three addresses will be the IP used to configure XA Client software. This final IP for the XA Client configuration should remain unassigned until later in the NLB set-up process.
Appendix B. Replication

Replication Setup Instructions

Replication is a function of Microsoft’s SQL Server 2005 and 2008 software. The steps below are instructions to configure the replication abilities to work optimally with our enterprise solution software. There are many configurability options within SQL Server, this document only covers HealthCast’s recommended standard configuration.

Please talk to your HealthCast representative if you feel you have variables in your environment that are not addressed here. Your HealthCast representative will help find a solution that fits your environment.

Requirements/Specifications

- Windows SQL Server 2005 or 2008 with the latest service pack and updates
  SQL Server Management Studio must be installed
- 2 servers with XA (and other HealthCast software as appropriate) already installed
  Databases should be setup and configured on each machine
- Ensure that disk space is adequate (as recommended in the requirements/recommendations document) for installing a new distribution database

Preparation

These items are mandatory for replication to be correctly configured. Please follow the instructions to ensure that each item is addressed before you begin to set-up replication.

Enable and Run Agent XPs

Agent XPs must be enabled in SQL Server BEFORE beginning the replication configuration. Open SQL Server Management Studio.

Enable the Agent XPs

1. Connect to both of your XA servers.

   *The XA servers in our example are named XAS1 (Primary server) and XAS2 (Secondary server)*

2. Verify that the SQL Server Agent (Agent XPs) is disabled.

   *If the Agent XPs are already enabled, skip the remaining steps and continue with the instructions to Run the SQL Server Agent.*

3. Select a server and click the New Query button.
4. Type `sp_configure 'Agent XPs', 1
go` reconfigure`go` into the query field and press the **Execute** button. *This will enable the Agent XPs for the server you selected.*

5. Repeat this process with the next XA server.

**Run the SQL Server Agent**

1. Right-click on the **SQL Server Agent** entry under the server you are currently working on.
2. Select **Start** from the menu. *This will run the SQL Server Agent.*
3. Repeat this step with the second XA server.

**Configure DCOM**

Ensure that DCOM is configured as follows on each server. The procedure varies slightly between Microsoft Server editions. DCOM is the communications technology that Microsoft SQL Server uses to perform replication between servers.

**Windows Server 2003**

1. Run `dcomcnfg` (Start -> Run -> dcomcnfg)
2. Open component services -> computers -> my computer. Right click on "my computer" and select properties.
3. Select the MSDTC tab. Click the “Security Configuration” button.
5. Ensure Network DTC Access, Allow Inbound, Allow Outbound are selected.
6. MSDTC service restart is required

**Windows Server 2008**

1. Run `dcomcnfg` (Start -> Run -> dcomcnfg)
2. Open component services
3. Expand computers -> my computer -> Distributed Transaction Coordinator -> Local DTC
4. Right click and select properties. Click the security tab.
5. Ensure Network DTC Access, Allow Inbound, Allow Outbound are selected.
6. MSDTC service restart is required
AD Account Verification

Record the username and password for the AD account that is the authorized SQL Service user. This account must have Administrator permissions on both XA servers. Both the SQL server agent and the SQL Server service need to run as the AD account authorized SQL Service user. The SQL service AD user account needs to be in the local “Administrators” group on both machines.

This same AD account will be used during the replication process. (This is the xaserver user that was created during the XA install unless you choose another name/user during the XA install process.)

AD User Name______________________

Password_____________________

Choose Your Distribution Server

Analyze the two XA Servers that you will be replicating. Decide which server you would like to use as the Distribution server. This server should have the most space available to store replicated data, and should have the least amount of activity. It is important to choose the server that has the most available resources. Record which server you will use as your Distribution server.

Server chosen for distribution ______________________________.
Create a Shared Replication Folder

Create a folder for replication data. This folder should be created on the XA Server you choose to use as your distribution server. Choose a location in the directory that has the most available resources (at least 100 GB of storage space and is minimally used by other files, folders, applications, and processes).

- Name the folder **ReplData**
- Share the folder on the network
- Give the AD account that is the authorized SQL Service user Read and Change permissions to this share
- Test the share by logging in with the SQL Service AD user account on the non-distributor XA server and add/delete/change a file to ensure that the correct permissions are in place

**Note:** This data can be large! The share should be located in an area with a LOT of space. 100 GB or more is recommended.

Give the AD account that is the authorized SQL Service user (“xaserver” if following this document’s recommendations) “Read” and “Change” permissions to this share. Remove the permissions to this share for the “Everyone” group.

Create a Database Folder for the Distribution Database

Create a folder to hold the distribution database. This folder should be created on the XA server you choose to use as your distribution server. Choose a location on the server that has the maximum amount of storage space and is least used by other files, folders, applications, and processes.

- Name the folder **DATA**
- Record directory location of the folder

DATA folder location________________________________________________________________________
Configure Distribution

**NOTE:** You must use the SQL Server Management Studio to set up the distribution service. Using the service manager will not set up distribution correctly.

**Run the Distribution Wizard**

*Click Next on each screen after you have completed the required action.*

1. Login to the XA server you have chosen as your distribution as recorded above.
2. Open the **SQL Server Management Studio** and connect to both instances of SQL Server on the primary and secondary XA servers.
3. Expand the replication folder, right-click on **Configure Distribution**.
   - This activates the **Configure Distribution Wizard**.
4. Select the XA server you have chosen as your distribution server.
   - If it is not the first option listed, select the second radio button and navigate to the designated server.
5. Click **Next** if necessary to get to the **Distributor** screen.
6. Select **Yes**, configure the **SQL Server Agent** service to start automatically.
   - If this has already been setup on your system you will not see the **SQL Server Agent Start** dialog box.
7. In the **Snap Shot** folder window, enter the shared replication folder information recorded above.
   - Your entry should be similar to `\nameofserver\ReplData`.
8. In the **Distribution Database** window, leave distribution as the default name and enter in the folder location of the **DATA** folder.
   - We recommend you do not use the default directory and folder that SQL Server provides.
9. Always use the primary server as the publisher. Select it from the **Publisher** dialog box.
10. In the **Wizard Actions** window, ensure that **Configure distribution** is checked.
11. Verify that the data is correct then click **Finish**.

   *You will see the success screen when the process has completed.*

**NOTE:** At this point you may encounter a number of various errors. This is very common during setup. Most of the errors encountered can be easily resolved using the MSDN or TECHNET resources.

If you need to redo the process, you must begin by undoing what was previously done. Right click Replication folder and select Disable Publishing and Distribution.

- Select **Yes, disable publishing on this server**
- Then click **Next** and **Finish**
Create a New Publication (SQL 2005)

Before beginning, check that the **SQL Server Agent** is running on both servers.

**Run the New Publication Wizard**

*Click Next on each screen after you have completed the required action.*

1. Right-click on **Local Publication** and select **New Publication**. *This starts the New Publication Wizard.*
2. In the **Publications Database** screen, select the database that has been created for XA Server. *This is the database from which you will be publishing.*
3. In the **Publication Type** screen select **Transactional publication with updatable subscriptions**.
4. Ensure SQL Server 2005 is checked.
5. Select **Tables** in the **Objects to publish** box.
6. Click **Next** successively until you get to the **Agent Security** screen.
7. Click the **Security Settings** button and select **Run under the following Windows account** in the dialog box.
8. Enter the AD user account and password recorded above and click OK. *The domain username will now be displayed in the Agent Security screen.*

**NOTE:** It is OK for SQL Server Service to use this account because we configure SQL Server Service to be a local administrator domain account only. This is considered to be safe and best practice.

9. Click **Next** successively until you get to the **Complete the Wizard** screen.
10. In the **Complete the Wizard** screen, name the database **xa_pub** so that you can see clearly it is a publication. Keep the name all lower case.
11. Then select **Finish**. *You will see the success screen (screenshot) if you have completed the steps successfully.*
Create a New Subscription (SQL 2005)

Run the New Subscription Wizard
*Click Next on each screen after you have completed the required action.*

1. Right-click on the **xa_pub** publication in the **Local Publications** folder and select **New Subscriptions** from the menu box.
   *The New Subscription Wizard will appear.*
2. In the **Publication** screen, make sure the **xa_pub** publication is selected.
3. In the **Agent Location** screen, choose the location with the most available resources.

   **Note:** Use whichever server has the least processes running and the most resources on the back end. Check for the processes and available memory before assigning a location to ensure that performance is balanced. Run the agent from the best location.

4. In the **Subscriber** box select **Add SQL Server Subscriber...** to add the secondary server.
5. Choose the secondary server from the **Server name** dropdown field and select **Connect**.
   *If the connection is successful, the second server will be added to the server list in the Subscribers dialog box.*
6. Check the box next to the secondary server name to select it.
7. Then select the XA server database from the dropdown list.
8. Select the **Run under the SQL Server Agent Service account**
   *The note says this is not recommended, but is safe practice because of the other security measures in place.*
9. Click **Ok**, then **Next** on the following screen.
10. Change the **Agent Schedule** to **Run continuously** from the dropdown.
11. In the **Initialize Subscriptions** screen, leave the default setting of **Immediately**.
12. Leave the **Subscription Type** as the default settings.
13. In the **Wizard Actions** screen, ensure that **Create the subscription(s)** is checked.
14. Select **Finish** on the **Complete the Wizard Screen**.
   *The success screen will appear if the subscription has been created successfully.*
Create a New Publication (SQL 2008)

Before beginning, check that the SQL Server Agent is running on both servers.

Run the New Publication Wizard

Click Next on each screen after you have completed the required action.

1. Right-click on Local Publication and select New Publication.
2. Click Next on the Welcome Screen.
3. Select the database to be published.
4. On the Publication Type screen select “Transactional publication with updatable subscriptions”.
5. On the Articles screen, select Tables.
6. Click next on the Article Issues screen.
7. Click next on the Filter Table Rows screen.
8. Select “Create a snapshot immediately and keep the snapshot available to initialize subscriptions.”
9. Set security settings for the Snapshot Agent, Log Reader Agent and Queue Reader Agent.
   - Use the Run under the SQL Server Agent service account for each agent.
10. On the Wizard Actions screen, ensure that “Create the publication” is selected.
11. Give the Publication a name on the “Complete the Wizard” screen. Click Finish.
12. The Creating Publication screen will complete. Click the close button.

Create a New Subscription (SQL 2008)

Click Next on each screen after you have completed the required action.

1. Right-click on the publication created in the previous step and select New Subscriptions.
2. Ensure the publisher is correct and that the publication is selected.
3. On the Distribution Agent Location select Run all agents at the Distributor.
4. On the Subscribers screen select Add SQL Server Subscriber.
   - Choose the secondary database server and database.
5. On the Distribution Agent Security screen set both:
   - Connection to Distributor and Connection to Subscriber to use the SQL Server Agent account.
6. Set the Agent schedule to Run continuously on the Synchronization Schedule screen.
7. Ensure that on the Updatable Subscriptions screen that the Subscriber is set to "secondary".
   - Simultaneously commit changes and replication should be set.
8. Create a linked server (Use SQL Server Authentication) login for Updateable Subscriptions.
9. On the Initialize Subscriptions screen ensure the subscriber is the secondary server.
   - Initialize should be checked. “Initialize When” should be set to Immediately.
10. On the Wizard Actions screen ensure that 'Create the subscription(s)' is checked.
11. Click Finish on the 'Complete the Wizard' screen.