LESSON 1.2: Architecture and Performance

What this lesson is about

This lesson describes the Sterling B2B Integrator system hierarchy as a means to isolate performance problems. It introduces system and Operating System requirements and provides an overview of high-level Sterling B2B Integrator architecture and logical flow as they relate to performance. Lastly, this lesson gives an overview of key release-based performance improvements.

What you should be able to do

After completing this lesson, you should be able to:

■ Describe the Sterling B2B Integrator system hierarchy and components.

■ Describe high-level Sterling B2B Integrator architecture and identify potential problem areas.

■ Identify potential performance impact areas in the Sterling B2B Integrator architecture.

How you will check your progress

■ The progress of the lesson is analyzed based on the successful application of the topics in the scenario.

References

Documentation

■ Sterling B2B Integrator Architectural Overview:

https://www.ibm.com/support/knowledgecenter/SS3JSW_5.2.0/com.ibm.help.overview.doc/SI_ArchOverview.html

Sterling B2B Integrator System Hierarchy

System Hierarchy

The Sterling B2B Integrator environment can be viewed as a layered hierarchical model. Separating the Sterling B2B Integrator environment into layers helps understand, isolate, and troubleshoot the problem.

The following diagram shows the Sterling B2B Integrator Systems Hierarchy layers:
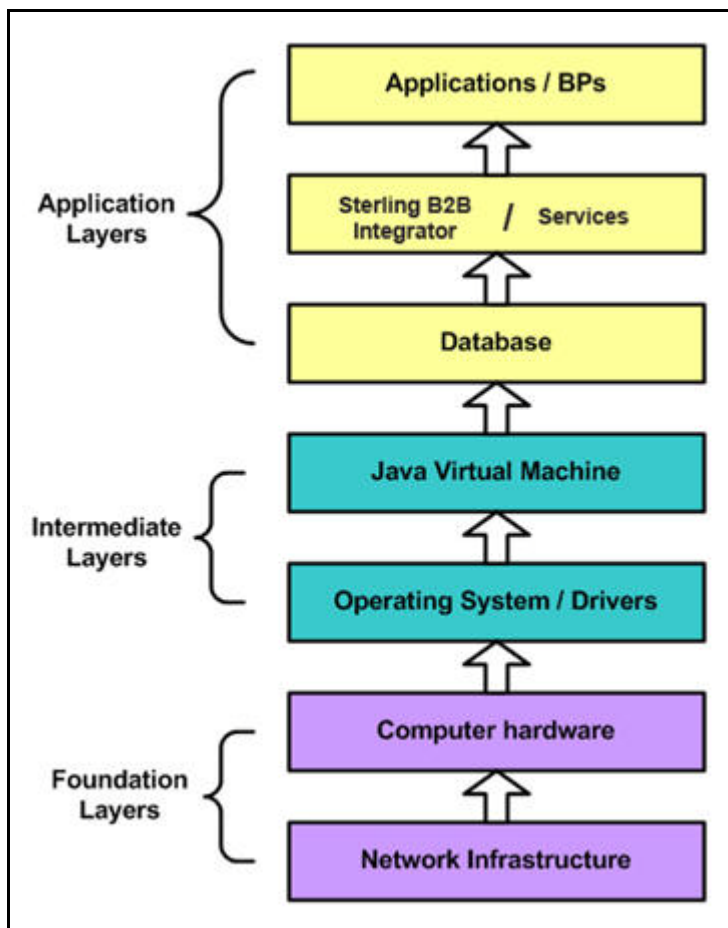
Sterling B2B Integrator System Hierarchy

System Hierarchy

Network

The functions and features of the network layer are as follows:

- The network layer is the infrastructure (both LAN and WAN) that connects the Sterling B2B Integrator system with the database and other systems.

- Its impact on performance varies depending on the Sterling B2B Integrator configuration.

- If Sterling B2B Integrator and the database are on the same computer, the impact of the network is not as great. However, this setup is not suggested for medium and large-scale setups.

- This setup hinders the scalability and creates a possibility of single point of failure.

- If Sterling B2B Integrator and the database are on different computers, then it is a major factor. Sterling B2B Integrator and other computers with which it must communicate relies on the network layer.

- The network is especially important in a Sterling B2B Integrator clustered environment.

Computer Hardware

The functions and features of the computer hardware as follows:

- The computer hardware runs Sterling B2B Integrator and the database.

- Sterling B2B Integrator depends primarily on the computer hardware for performance.

- The value of accurate sizing done during the planning cannot be underestimated.

- If the computer hardware is undersized and cannot perform under the required workloads, gains that are achieved through performance tuning cannot correct the problem.

- As an analogy, if the engine in a truck does not have enough horsepower to haul a specific load, no amount of tuning helps.

Sterling B2B Integrator System Hierarchy

System Hierarchy

Operating System

The functions and features of the Operating System as follows:

- The operating system sits on top of and controls the computer hardware.

- It is the primary interface for applications. Sterling B2B Integrator works with many different operating systems (OS).

- It is supported on Windows Server, several variations of UNIX, several distributions of Linux and i/OS.

- The combination of the Hardware and OS is referred to as the platform.

- The performance tuning variables that can be adjusted and the tools available for monitoring and diagnostics varies from one OS to the next.

Java Virtual Machine

The functions and features of the Java Virtual Machine are as follows:

- The Java Virtual Machine (JVM) runs on top of the OS and is the translator between Sterling B2B Integrator and the OS.

- The JVM converts Java applications code to platform-specific system code. Because Sterling B2B Integrator is based on Java, each platform on which it runs requires a platform-specific JVM be installed first.

- The JVM has a significant impact on performance and there are number of Java variables that can be tuned to obtain optimal performance.

Sterling B2B Integrator System Hierarchy

System Hierarchy

Database

The functions and features of database are as follows:

- Sterling B2B Integrator requires a relational database to function.
- The database must be installed when Sterling B2B Integrator is installed.
- Sterling B2B Integrator supports Oracle, Microsoft SQL Server, IBM DB2, and MySQL databases.
- Sterling B2B Integrator and the database can be co-located or on separate computers.
- When the data volume is low, Sterling B2B Integrator and the database can be installed on the same computer.
- If the data volume is high, install Sterling B2B Integrator and the database on separate computers. Placing the database on a separate computer provides dedicated resources (processor and I/O), especially in high-volume enterprise-level installations.
- This arrangement facilitates scaling making the configuration for Sterling B2B Integrator and database failover independent of each other.
- Sterling B2B Integrator performance is closely tied to the database.
- The database is almost always the ultimate arbiter of performance.
- The database is used for just about everything from storing user data and internal statistics to Business Processes (business processes) and Sterling B2B Integrator operational information.
- It is suggested that the Sterling B2B Integrator database and schema be the only applications that are running on the database server.

Sterling B2B Integrator

The functions and features of Sterling B2B Integrator are as follows:

- Sterling B2B Integrator is a Java based integration engine for modeling and managing business processes.
- Sterling B2B Integrator supports high volume electronic message (or document) exchange, routing, translation, and integration with internal systems and external partners.
- It can be thought of as a business process execution engine and Sterling File Gateway.
- Sterling B2B Integrator runs on top of the JVM and has many variables that can be tuned to achieve optimal performance.
- These tuning options can be run manually or through the Performance Tuning Utility.

Sterling B2B Integrator System Hierarchy

System Hierarchy

Applications

The functions and features of applications are as follows:

- At the top of the Sterling B2B Integrator hierarchy model are the applications.

- Applications are pre-configured services and user-defined processes that run within the Sterling B2B Integrator environment and interact with the database.

- Application components include business processes and system processes that activate services, adapters, and maps.

- The design of business processes is crucial to the performance of Sterling B2B Integrator.

- A well-designed business process runs efficiently whereas a poorly designed business process, which can accomplish the same thing, can put significant load on the system.

High-Level Sterling B2B Integrator Architecture

Introduction

This section focuses on the areas where performance problems can occur in the Sterling B2B Integrator architecture components.

The diagram shows the Sterling B2B Integrator physical components. It represents the primary components and network interconnections for a single-node Sterling B2B Integrator installation.

- Trading partners A and B communicate with the Remote Perimeter Server (PS) in the DMZ, typically through a WAN link.

- The perimeter server client in the Sterling B2B Integrator Server initiates contact and transmits files to and from the Remote PS with a LAN connection.

- The database server is on a same computer that is connected to the Sterling B2B Integrator Server by using a high-speed LAN link (Fast Ethernet or better).

- The Sterling B2B Integrator server also communicates with internal applications by using the LAN and with other business units within trusted network by using LAN or WAN.
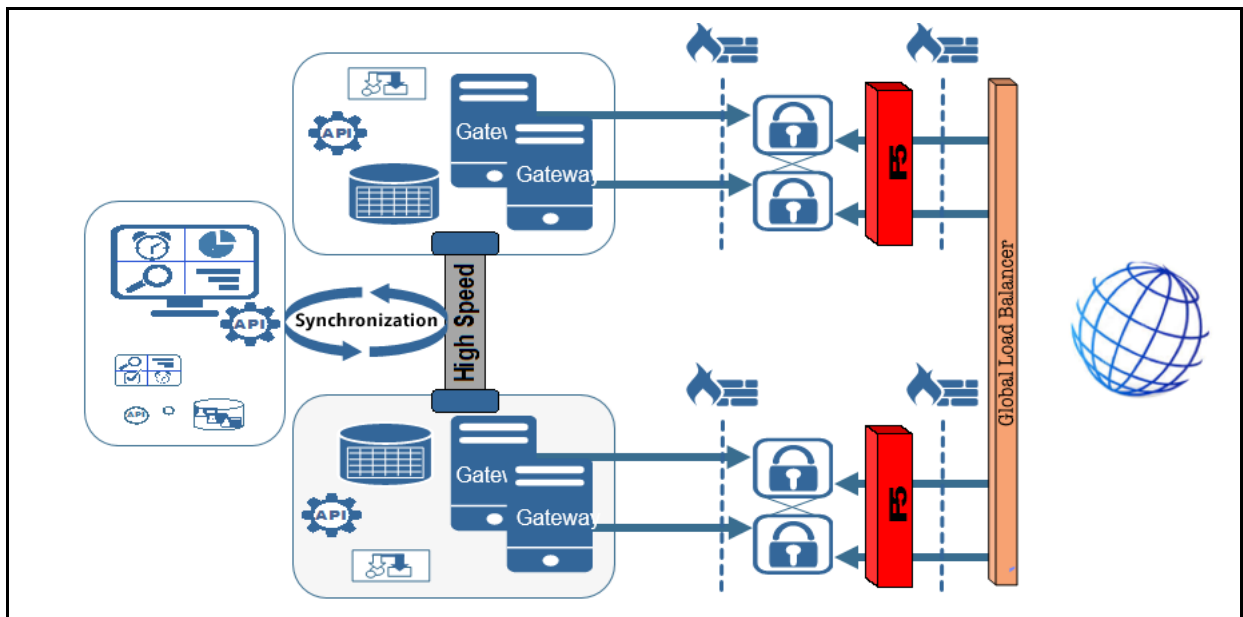
Perimeter Servers

Introduction ....(Continued)

A perimeter server is an optional software tool for communications management. A perimeter server can be installed in a Demilitarized Zone (DMZ). A DMZ is a computer host or small network that is inserted as a neutral zone between a company's private network and their public network.

A perimeter server is communication management software that is installed in a DMZ that manages communication flows between a perimeter network and Sterling B2B Integrator TCP-based transport adapters.

Sterling B2B Integrator uses perimeter servers to minimize Demilitarized Zone (DMZ) issues, enhance scalability, enhance the process of handling large files, and improve performance.

In Sterling B2B Integrator the perimeter network is an extra layer of security between a secured internal network and an unsecured external network. A perimeter server communicates with Sterling B2B Integrator through the special perimeter services available in Sterling B2B Integrator. These perimeter services enable an adapter to communicate with a perimeter server within the DMZ through an internal firewall.

Sterling B2B Integrator perimeter services can:

- Work with the complete Sterling B2B Integrator-supported range of transport protocols.
- Enable data to get through the firewall to ensure security.
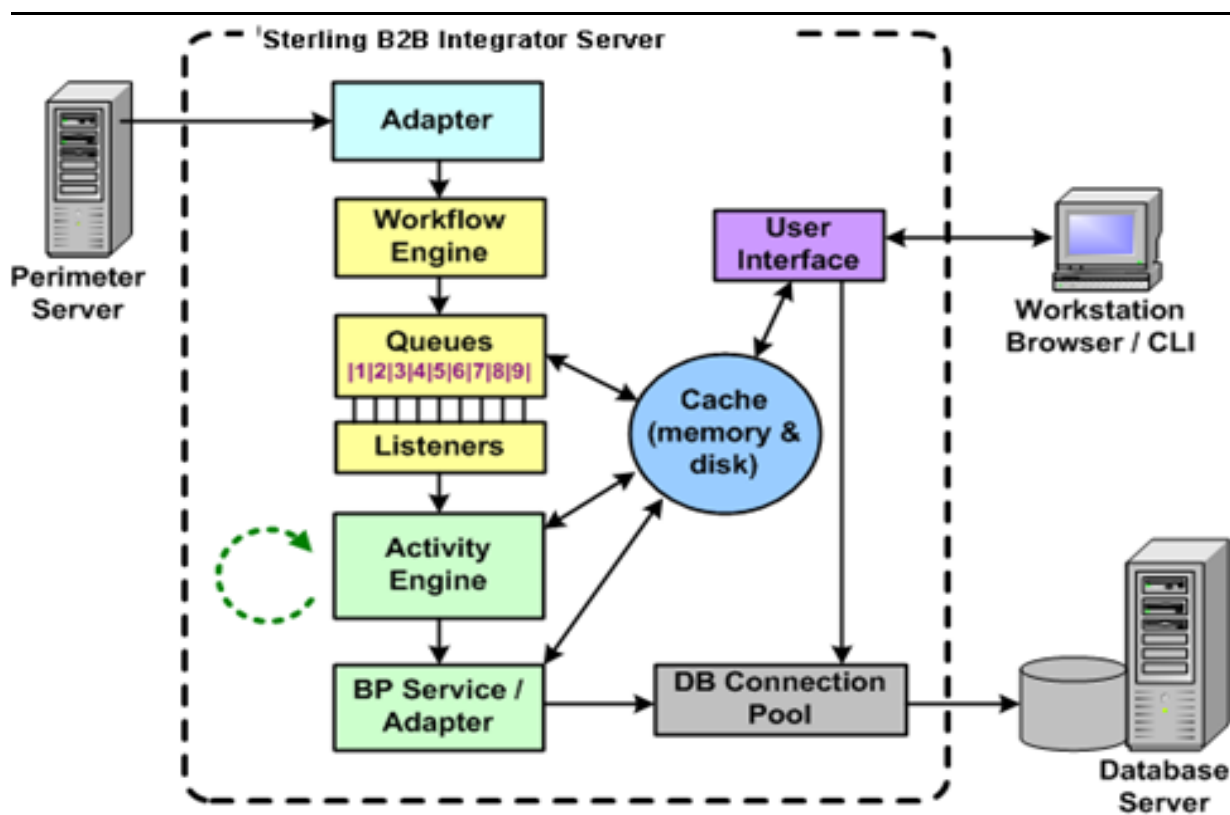- Support both small and large file size requirements.

Provide a lightweight solution, to use inexpensive machine in the DMZ.

Components of Sterling B2B Integrator

Introduction

The following diagram shows the major internal components in Sterling B2B Integrator. These components interact with one another to process incoming and outgoing data.

Components of Sterling B2B Integrator

Component workflow scenario

The following table describes a typical scenario for when data enters Sterling B2B Integrator from a perimeter server through an adapter.

A brief description of the key components and their interaction is explained here.

Component	Interaction
Perimeter Server	The Perimeter Server (PS) receives a file from the trading partner. A PS communications management software that is installed in a DMZ computer that manages communication flows between a perimeter network and the Sterling B2B Integrator TCP-based transport adapters. PS reduces network congestion, provides scalability for high volume environments, and enhances the security.
Adapter	The adapter (such as FTP or HTTP) receives the file and places the data into an initial workflow context. It then starts the Workflow Engine. An adapter is a special type of Sterling B2B Integrator service that communicates with the entities external to Sterling B2B Integrator.
Workflow Engine	The Workflow Engine (WFE) loads the business process definition and determines the first service in the business process. It places the workflow context and business process step in one of the queues.
Perimeter Server	The Perimeter Server (PS) receives a file from the trading partner. A PS communications management software that is installed in a DMZ computer that manages communication flows between a perimeter network and the Sterling B2B Integrator TCP-based transport adapters. PS reduces network congestion, provides scalability for high volume environments, and enhances the security.
Queue	One of the nine Queues receives the data and business process to be run. A business process can be associated with a particular Queue when it is checked in based on the type of processing to be done.

Components of Sterling B2B Integrator

(Continued)

Component workflow scenario

| Component	Interaction
Listener	The listener that is attached to the Queue runs the Activity Engine (AE) with the workflow context from the Queue. One or more threads are assigned to the queue.
Activity Engine	The AE calls the service and receives the results from the service. It then requests a database connection from the pool, persists changes to the database and cache and immediately starts the next cycle. AE runs the next step or puts the next step context in the queue so the listener can run it.
Service/Adapter	Each service is called by the AE as it is needed. Each step in the business process can run a service, such as EDI De-envelope, or an adapter such as SAP.
Database connection pool	The AE requests a database connection from the pool and persist changes to the database as specified globally or in the business process. A limited pool of pre-established database connections is shared among processes that must read from or write (persist data or business process steps) to the database.
Database	The AE persists (writes) data, metadata, and business process steps to the database. The database is the repository for Sterling B2B Integrator defined assets (business processes, maps), and most data. An option is provided to store large documents in the disk file system instead of the database.

Network Interconnections

Wide Area Network (WAN) connections can exist between trading partners and the Perimeter Server. The communication between the Perimeter Server, the Sterling B2B Integrator Server, and the database server are typically through high-speed Ethernet LAN.

Potential performance impact area

Introduction

The following diagram identifies some of the more common potential performance problem areas with Sterling B2B Integrator components and interfaces. Although listed last, the sizing of the Sterling B2B Integrator, database, and Perimeter servers are critical. The problem areas are listed in order of likelihood (as described by the review team) and assume that the servers are sized properly.
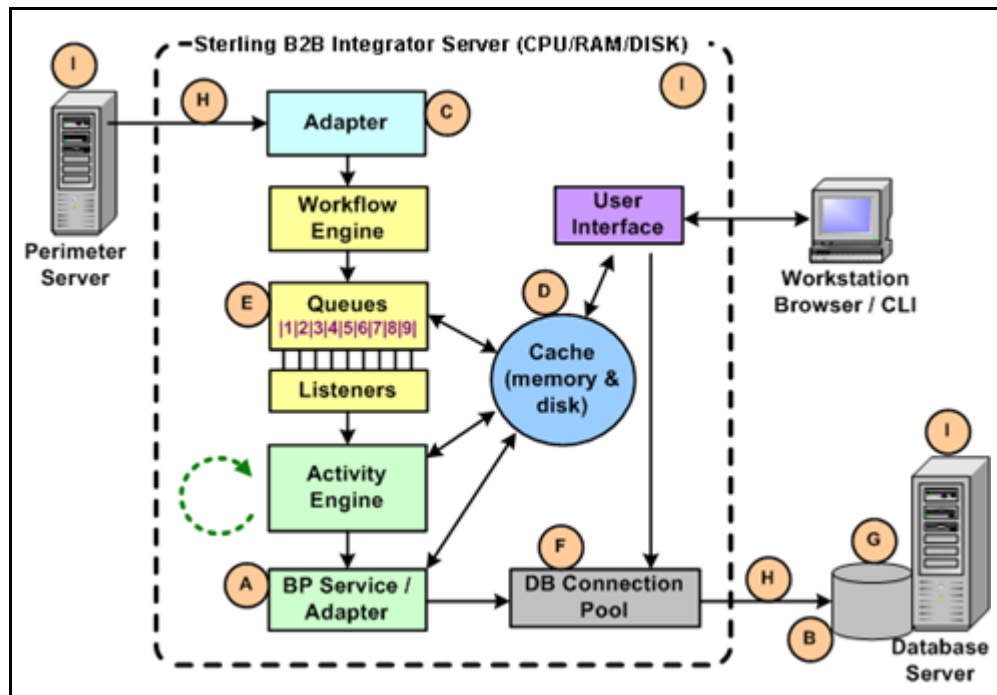
The points lists the functions of the Sterling B2B Integrator performance areas:

a. Business process design efficiency - many/long steps, async/sync/in-line

b. Excessive database persistence - business process steps and / or data

c. Adapter selection/version - outdated or less than optimal

d. Inadequate memory assigned Sterling B2B Integrator - working memory and cache allocation

e. Queues overloaded - not enough resources (threads)

f. Database connection unavailable - pool connections

g. Database full - retention period, indexing/archive/purge services not running

h. Network links slow - bandwidth, settings, routers

i. Sterling B2B Integrator, database, and PS processing capability

Lesson review

What you have been able to do

After completing this lesson, you should have been able to:

- Describe the Sterling B2B Integrator system hierarchy and components.
- Describe high-level Sterling B2B Integrator architecture and identify potential problem areas.
- Identify potential performance impact areas in the Sterling B2B Integrator architecture.

LESSON 1.3: Installation and Configuration

What this lesson is about

This lesson provides detailed procedure to install Sterling B2B Integrator on Windows Environment. The complete installation process from maintaining an installation checklist, installing the software, validating the installation, and post installation configuration.

What you should be able to do

After completing this lesson, you should be able to:

- Maintain installation checklist.
- Install Sterling B2B Integrator on your workstation.
- Validate the installation.
- Configure the installation for a Windows environment.
- Describe the methods to set up, monitor, and start and stop the adapter containers.

How you will check your progress

- The progress of the lesson is analyzed based on the successful application of the topics in the scenario.

References

Documentation

- Installing the software with the installation manager in GUI method:

  https://www.ibm.com/support/knowledgecenter/SS3JSW_5.2.0/com.ibm.help.sb2bi_install_upgrade_526.doc/install_win_non_clus/SI_Install_GUI_Window_NC.html

- Downloading Sterling B2B Integrator V5.2.6

  http://www-01.ibm.com/support/docview.wss?uid=swg24040961

Installation checklist

Introduction

To install the Sterling B2B Integrator on your workstation, you need to complete certain prerequisite tasks that are mentioned in the installation checklist.

The Installation checklist contains the following items:

- Brief description of tasks.
- Information to be gathered for a successful installation.

This information needs to be collected for each node in the cluster.

Tasks	Node1
Review the license Information in IBM contract so that you can select the right components/ features to install.	
Decide the Installation method to use: IBM Installation Manager Silent Installation	
Decide on the security certificates that you want to use: Default self-signed SSL (Secure Sockets Layer) certificate that is automatically installed A Certificate Authority-related certificate is installed.	
If using an Microsoft SQL Server or DB2 database, decide whether you manually or automatically apply Database Definition Language (DDL) Statements (schema) to the database.	
Determine whether the database password needs to be encrypted.	
Note the host name on which you plan to install the software.	

Installation checklist

Introduction

Tasks	Node1
Note the Directory Name where you plan to install the software.	
Note the Login to the host system.	
Note the Password to the host system.	
Note the path to the JDBC drivers.	
Note the path to the installation wizard and file name.	
Note the path to JDK.	
Note the path to JCE file.	
Note the Host IP address.	
Note the Initial Port Number.	
Note the System passphrase.	
Note the Database vendor name.	
Note the Database user name.	
Note the Database password.	
Note the Database (catalog) name.	
Note the Database host name.	
For Oracle and Microsoft SQL Server, note the path and file name for the JDBC Driver.	
For DB2, note the absolute paths and file names for two JDBC drivers.	
Determine whether your Windows environment is: Windows 2003 or earlier Windows Server 2008	
Ensure that you have read and write privileges on the parent installation directory.	

Installation checklist

(Continued)

Multicast ports Node to Node communication

Cluster nodes are configured to communicate with each other using JGroups, an open source toolkit that provides flexibility for protocol configuration. JGroups provides rich open management features, along with multiple protocol support. JGroups supports multicast (UDP) and TCP-based communication protocols.

When JGroups is configured to use multicast (UDP), all cluster nodes communicate with each other on a specific IP address and port. The multicast ports are configured based on the installation base port.

All clusters that are on the same subnet that is configured on the same base port send multicasting messages on the same multicast IP address and port. Each cluster on the same subnet needs to be configured on different base ports. Install the clusters on different port ranges or on different network segments with multicast forwarding restricted, so that they do not interfere with each other.

All nodes that are participating in the same cluster must be installed on the same multicast base port (the multicastBasePort property in the noapp.properties_platform_ifcresources_ext.in file). This is computed from the system base (non-multicast) port, but can be configured separately in the

noapp.properties_platform_ifcresources_ext.in file, to allow different nodes in a cluster to be installed at different (non-multicast) port ranges. Also, all the nodes in the cluster to be installed in the same subnet. For node to node communications, the properties are defined in jgroups_cluster.properties. The attributes that are used to define communications are:

- property_string - default value is UDP.

- distribution_property_string - default value is TCP. Never set this attribute to UDP

Installation checklist

Multicast ports Node to Node communication

To change the communication for cluster multicast from the UDP protocol to TCP, the value the property_string property in the jgroups_cluster.properties.in file (after file back up), needs to be changed, and then the setup files command need to be run. These changes can be made right after the installation or after the cluster starts running. If the file is changed the cluster, stops all node of the cluster, change on each node, and then restart the cluster.

To change the communication for cluster multicast from the UDP protocol to TCP, use the following value for the property_string property in the jgroups_cluster.properties.in file:

```
property_string=TCP(start_port=any_available_port_number):
TCPPING (initial_hosts=this_instance_host_ip[start_port_number],
theothernode_instance_host_ip[theothernode_start_port_number];port_range
=2;
timeout=5000;num_initial_members=3;up_thread=true;down_thread=true):VERI
FY_SUSPECT(timeout=1500):
pbcast.NAKACK(down_thread=true;up_thread=true;gc_lag=100;retransmit_time
out=3000):
pbcast.GMS(join_timeout=5000;join_retry_timeout=2000;shun=false;print_lo
cal_addr=true;down_thread=true;up_thread=true)
```

Port numbers in windows environment

During installation or upgrade, specify the initial port number for Sterling B2B Integrator.To specify an initial port number, use the following guidelines:

Sterling B2B Integrator requires a range of 200 consecutive open ports 1025 - 65535. The port range starts with the initial port number and ends with the number that equals the initial port number plus 200. For example, if you specify 10100, then you need to make sure that 10100 through 10299 are not used by any other applications on your system.

Note

The initial port number represents the beginning port number in the range.
Make sure that port numbers in the port range are not used by any other applications on your system.

During the upgrade, about 50 default ports are pre-assigned for different services.

Installation checklist

Security certificates

Before starting the installation, decide which of the following security certificates you want to use:

■ The default self-signed SSL (Secure Sockets Layer) certificate that is automatically generated by the installation.

■ A Certificate Authority-related certificate is generated before installing the software.

If you install with the default SSL certificate, but you later want to switch to a CA-related certificate, you can change the sslCert property file in the noapp.properties_platform_ifcresources_ext.in file.

Upgrade Information

This section provides general information for installing or upgrading the IBM Sterling B2B Integrator on a Windows Cluster Environment.

📝 Note ──

Sterling B2B Integration must be installed behind a company firewall for security purposes. For more information about secure deployment options, see "Perimeter Server and Security" topics in the Sterling B2B Integration documentation.

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Installation Methods

The following methods can be used to install the Sterling B2B Integrator:

■ IBM Installation Manager (graphical user interface)

■ IBM Installation Manager (Text Based)

📝 Note ──

IBM Installation Manager must be used by all users run Windows and UNIX operating systems. You must also use IBM Installation Manager for upgrading by installing Version 5.2.6 as a patch.

───

Installation checklist

<u>Guidelines</u>

The guidelines for installing the Sterling B2B Integrator are:

- Do not create the installation directory manually before the start of the installation. If you create the installation directory before you begin, the installation fails.

- The server on which you are installing must have adequate free disk space. The installation directory must have adequate free disk space.

- The name of the directory cannot include spaces and must be fewer than 30 characters long excluding separators. Using a directory name of more than 30 characters might create an installation that is impossible to delete. An example of an installation directory is C:\SI_52\install_dir\install.

- All nodes must use the same database.

- All nodes must use the same passphrase.

- All nodes must use the same operating system.

- When nodes are installed on different systems, the initial port numbers must be the same. Installing nodes are different systems that help you take advantage of cluster features such as, reliability, availability, scalability, and fail over.

- When nodes are installed on the same system, you must install Node 2 and higher in different directories. Each initial port must be at least 200 higher or lower than the initial port for the other nodes.

- If you need to install more than one instance of Sterling B2B Integrator on the same Windows server, you must install the second instance in a different directory.

- If you are installing Sterling B2B Integrator on VMware, provide the IP address of the virtual machine, not the IP address of the VMware host. For example, if 192.168.40.100 is the IP address of the VMware host and 192.168.40.100 is the IP address of the Windows 2003 server it is hosting, you use 192.168.40.100 as the correct IP address to install Sterling B2B Integrator.

- Sterling B2B Integrator does not support IPv6 installation on Windows. To apply an IPv6 address, see the *IPv6 Capabilities* section in the System Requirements.

- The installation creates subsequent ports based on the initial port number. For all of the port assignments, see the install_dir/install/properties/sandbox.cfg file.

Installation checklist

Installation Manager

IBM Installation Manager Software Delivery Platform is an installation management tool that installs and maintains Installation-Manager-based software packages. Installation Manager enable you to modify feature sets and search for updates of installed software. The Installation Manager ensures that only compatible fixes are applied to a software installation.

- The on-screen options to manage licenses, Roll back, Modify, and Update are not functional as part of the Sterling B2B Integrator release 5.2.3.
- The uninstall Software option removes only the Sterling B2B Integrator from the Installation Manager. The uninstall procedure as described in uninstall Sterling B2B Integrator from a Windows Non-Cluster Environment must be performed to uninstall Sterling B2B Integrator.
- The Installation Manager must be installed on each computer on which Sterling B2B Integrator is being installed.
- If an existing version of Installation Manager that is installed on your computer for use with other IBM applications, then it can be used with Sterling B2B Integrator.

If you do not have the Installation Manager that is installed, it is provided as part of the installation media and can be installed as part of the Sterling B2B Integrator installation.

User Interface

The Installation Manager User Interface feature includes:

- The choice of either entering the paths or selecting the paths and files (Select File).

Internal navigational button on every screen in the Installation Manager. You need to click **Next** to move to the next step. The click **Next** step is not represented in each step in the procedure.

📝 Note

The **Next** button is not enabled until you enter data on a screen. For fields that require validation, you must click out of the field somewhere on the screen to trigger the validation and after validation completes, the button activates.

- For every screen in the Text-Based installation wizard, you need to press **Enter** to move to the next step. The **Press Enter** step is not represented in each step in the procedure.
- Numbered options for each step in the Installation Manager's text mode, you need to press **Enter** to move to the next step.
- The ability to go to the different installation configuration pages out of sequence.

Installing the software

Introduction

This section, helps to learn how to install the Sterling B2B Integrator on your workstation by using the IBM Installation Manager.

Procedures

Complete the following procedure to install the Sterling B2B Integrator

1. Close all open Windows programs and command prompt windows.
2. From the Installation media, copy the installation package to a location on your desktop.
3. Uncompress the installation package.
4. Browse and go to the installation package folder.
5. Start the installation as given in the following steps,
   - For Windows Server 2003 or earlier
     – From a command prompt (or from the **run** dialog box), type **install.exe**.
   - For Windows Server 2008
     – Click **Start**.
     – Right-click at **Command Prompt** and select **Run as administrator**.
     – The **Administrator Command Prompt** dialog box is shown.
     – Type **install.exe.**
     – The **Installation Manager** opens.
6. Click **Next** to start the installation.
7. Review the license agreement and select the option that I accept the terms in the license agreements to continue. If you do not accept the agreement, the installation process is canceled.
8. Select a location for the shared resources directory and a location for Installation Manager:
   a. Specify a Shared Resources Directory.
   b. Specify an Installation Manager Directory.
9. Choose an installation package group to use.
   a. Select the appropriate option for this installation:
     – Use the existing package group
     – Create a new package group
   b. Specify the path to the Sterling B2B Integrator Installation Directory. Below the installation directory, the installer creates a directory that is named **install**. This directory contains the installation files.

Installing the software

Procedures

10. Select the features to install.

    – Clear the check box of any features you do not want to install.

    – If other products are installed through the Installation Manager, updates for them can be displayed in your listing.

    – If you have not installed the Installation Manager, you need to do so, in order to proceed with the installation process.

11. Enter the full path to the **JDK directory**.

12. Select the **Features** to install. The following list is shown:

    ▪ IBM Sterling B2B Integrator and/or IBM Sterling File Gateway

    ▪ FIPS Module

    ▪ AS2 Edition Module

    ▪ Financial Services Module

    ▪ EBICS Banking Server Module

13. Select only the check boxes for the features that are defined by your IBM contract. If you are unsure which to select, the installation can proceed without making a selection and completes successfully. However, start and operation of the software requires one of the licenses to be selected. See *license Modification* to apply licenses post-install.

14. Enter the full path to your **JCE JAR file**.

15. Enter the path to the **Installation** JAR file (SI_*<build_number>*.jar).

16. Enter your **Installation panel properties** information:

    a. Enter the explicit IP address for the server or use the default value of localhost.

    b. Enter the Initial Port number to use.

17. Enter your System Passphrase information:

    a. Enter a passphrase.

    b. Confirm the passphrase.

18. Enter you **Email Information**:

    a. Enter the email address to which you want system alert messages sent.

    b. Enter the SMTP mail server (IP address or host name) that you want to use for system alert messages and other administrative notices.

19. Specify whether you want to **Enable FIPS** (Federal Information Processing Standards) mode, select the check box. The default is FIPS mode is disabled.

Installing the software

(Continued)

Procedures .....(Continued)

20. Select the database that you want to use (Oracle, Microsoft SQL Server, DB2,or MySQL).

21. From the following choices, select all the options that apply to this node:

Choices	Action
This installation is for a cluster node 2 or higher (Not applicable for MySQL).	For node 1: Do not select the check box. For node 2 or higher: Select the check box.
Apply database schema automatically? (Not applicable for MySQL)	If yes, no action required. The default is to automatically apply the DDL statements. To manually create the database schema, clear the **Apply database schema automatically** check box and continue with the remaining installation steps.

📝 Note

The installation runs for a short time and stops without error. When the installation stops, you must perform additional actions as given in Step 26 of this procedure.

22. Enter the **Database Connection Information**:

- Database user name
- Database password (and confirmation)
- Database catalog name
- Database host name
- Database port
- For Microsoft SQL Server - Absolute path and file name for one JDBC driver file
- For DB2: Absolute paths and file names for two JDBC driver files. Use the Type-4 JDBC driver. This type of driver converts JDBC calls into the network protocol that is used directly by DB2, allowing a direct call from the Sterling B2B Integrator to the DB2 server.

(Continued on next page)

Installing the software

Procedures

23. Click **Add** to browse to the file location for the appropriate JDBC driver.

24. Click **Test** next to the database driver path.

> ✎ Note ───
>
> The Installation Manager must successfully validate the connection to the database before you can continue with the installation.

25. Determine what **Other options** apply to this installation. Select the applicable options:

   a. **Verbose installs**

      This installation is an upgrade from a prior version - Do not select this option

   b. **Number of processor Cores** - Accept default value or enter appropriate value.

   c. **Physical Memory (MB) allocated to Sterling B2B Integrator** - Accept default value or enter appropriate value.

26. Review the installation package summary information.

27. Click **Install** to continue.

Database option

If you do not select the option to apply database schema automatically, the installation stops. You must complete following steps to install with manual DDL statements:

   a. Go to your install directory.

   b. Locate the PreInstallSI.log file and open it with a file editor.

   c. Search the file for these error messages:

      – *<install_dir>*/repository/scripts/EFrame_IndexAdds.sql must be applied to the database.

      – *<install_dir>*//repository/scripts/EFrame_Sequence.sql must be applied to the database.

      – *<install_dir>*//repository/scripts/EFrame_TableChanges.sql must be applied to the database. Exiting installation...

   d. Exit from the database.

   e. Go to the parent directory of *install_dir*.

   f. Delete (or Rename as a backup) the Sterling Integrator installation directory.

   g. Restart the Installation Manager and provide the same installation options that you provided before including clearing the Apply database schema automatically **c**heck box.

Installing the software

Procedures

The Installation Progress screen indicates which component of installation is in process.

The installation completes automatically. When the installation is complete, the system shows a dialog box with the message *The installation completed successfully*.

Installation information is in the InstallSI.log file. A status bar below the Repository Information heading shows the progress of component installation.

When the installation completes, a large green circle with a check mark is shown with the message. The *packages are installed*. A link is provided to view the installation log file.

28. Click **Finish**. The Installation Manager closes and you are returned to your desktop.

29. Check the **InstallSI.log** to verify all the components are installed properly. You need to run the *Configure the Sterling B2B Integrator Desktop Icon for Windows Server 2008* procedure if you use Windows Servers 2008.

> **Note**
>
> If you do not find the error messages in the log file, the installation failed because of another reason. You must resolve that error and attempt the installation again. If you did find these messages, continue with the remaining steps.

30. To install each additional node, go to the Installation Manager folder and start a new installation:

   - For Windows Server 2003 or earlier:
     - From a command prompt (or from the **run** dialog box), enter install.exe.
   - For Windows Server 2008:
     - Click **Start**.
     - Right-click **Command Prompt** and select **Run as administrator**.
     - The Administrator: Command Prompt dialog box is shown.
     - Enter **install.exe**.

The Installation Manager opens with an Installed Packages window. This window contains an informational message that you have an instance of Sterling B2B Integrator already installed. Click Continue to continue with your node 2 and higher installations. For node 2 and higher, follow the same steps as you did for node 1 until you get to Step 20. When prompted, select the This installation is for a cluster node 2 or higher check box.

Installing the software

Procedures

31. If you installed multiple nodes on the same system or used different base ports for node 2 onward, you need to complete the following extra steps:

Step	Action
1	Go to *install_dir*\install\properties for node 1.
2	In the noapp.properties_platform_ifcresources_ext file, record the value for multicastBasePort.
3	In the **jgroup_cluster.properties** file, record the values for the mcast_port parameters of the property_string and lock.protocolStack properties.
4	For each subsequent node, you need to run the remaining steps.
5	Go to *install_dir*\install\properties for each node (node 2 and higher).
6	In the noapp.properies_platform_ifcresources_ext. **in** file, update the value of the multicastBasePort to match the value for node 1. For example, replace the string &MULTICAST_NODE_PORT1; with the port number 45460: (before)multicastBasePort=&MULTICAST_NODE_PORT1; (after) multicastBasePort=45460
7	In the jgroups_cluster.properties.in and jgroups_cluster.properties_fifo_ext.in files, update all occurrences of mcast_port to match the values for node 1.
8	After updation the attributes for all of the nodes, enter: install_dir\install\bin\setupfiles.cmd for node 2 and higher.

Installing the software

Procedures

32. Determine whether you need to apply any maintenance patches to the installation. See the *System Maintenance* to get information about latest patch install.

📝 Note _____

As a component of IBM Sterling B2B Integrator, Global Mailbox enables licensed customers to optionally pay for an add-on component that provides high availability mailbox to exchange files. Global Mailbox is a robust and reliable way to store message data from partners in any geography. The golbal mailbox capability allows to deploy a B2B platform that can sustain continuous operations plus offer disaster recovery capabilities to the market.

_____

For more information on the Sterling B2B Integrator clustered installation in text-based method refer:

https://www.ibm.com/support/knowledgecenter/SS3JSW_5.2.0/com.ibm.help.install_win_clus_523.doc/SI_Install_Text_Windows_Clus.html

Validate the installation

Introduction

In order to check that the software installation was successful, you need to complete the following tasks. Each of these tasks is explained in greater detail in the following pages.

No.	Validate installation task	Completed
1	Configure the Nodes in the Cluster.	
2	Verify the Environment Settings in Property Files.	
3	Start the Cluster (for cluster installation).	
4	Access Sterling B2B Integrator.	
5	Validate the Installation (Sample Business Process).	
6	Verify that the server is running from the User Interface.	
7	Stop a Node (Hard Stop or Soft Stop) or Stop the Cluster.	

Verify the properties files in cluster installation

To verify the cluster environment is correct, you need to check the property settings on node 2.

Complete the following procedure to Verify the Cluster Environment Settings in Property Files

1. Verify that CLUSTER=true is in the sandbox.cfg property file.
2. Verify that CLUSTER=true is in the centralops.properties property file.
3. Verify that CLUSTER=true is in the noapp.properties property file.
4. Verify that cluster_env property=true is in the ui.properties property file.

Validate the installation

Configure the nodes in windows cluster

The first time you configure a cluster, you need to use the startCluster command with true option (startCluster.cmd nodeNumber true). Initial configuration to be the only time that you need to use the startcluster command. However, if you need to use the command again, use the startcluster command with the false option (startCluster.cmd nodeNumber false). The false option prevents any configuration changes from affecting the system, especially after installation of a patch.

Complete the following procedure to Configure the Nodes in Windows Cluster

To configure the nodes in a Windows cluster environment, you need to follow the following task for each node, starting with node 1:

1. Go to *install_dir*\install\bin for the node by using one of the following methods:
   - For Windows Server 2003 or earlier:
     – Open a command prompt window (from the run dialog box).
   - For Windows Server 2008:
     – Click Start.
     – Right-click Command Prompt and select Run as administrator.
     – The Administrator: Command Prompt dialog box is shown.

2. Enter startCluster.cmd <nodeNumber> <true or false>. Where <nodeNumber> is the number of the node. True complete database updates and false prevents database updates.

Example

For node 1, enter ./startCluster.cmd 1 true.

3. Enter startWindowsService.cmd. Perform this step for each node. The final startup processes that are run, concluding with the following message: Open your web browser to http://*host:port*/dashboard where *host:port* is the IP address and port number on your system.

4. Record the URL address so that you can access Sterling B2B Integrator.

Validate the installation

Start the Windows cluster

Complete the following Procedure to start the Windows cluster:

For each node in the cluster, starting with node1:

1. Go to *install_dir*\install\bin using one of the following methods:

    ■ For Windows Server 2003 or earlier:

      – Open a command prompt window (from the run dialog box).

    ■ For Windows Server 2008:

      – Click Start.

      – Right-click Command Prompt and select Run as administrator.

      – The Administrator: Command Prompt dialog box is shown.

2. Enter startWindowsService.cmd.

3. Enter your passphrase.

4. The final startup processes that are run, concluding with the following message: Open your web browser to http://*host:port*/dashboard, where *host:port* is the IP address and port number where Sterling B2B Integrator is on your system. Depending on system load, it takes several minutes for the UI to be ready.

5. Record the URL address so that you can access Sterling B2B Integrator.

If you need to release all the locks in a cluster and both nodes are down, use the restart parameter for Node 1. The restart parameter can be used only on Node 1. It cannot be used on any other nodes.

For example:

For Node 1, enter: startWindowsService.cmd restart

For Nodes 2 and higher, enter: startWindowsService.cmd

Validate the installation

Access the Sterling B2B Integrator

Procedure to Log in to Sterling B2B Integrator

1. Open a browser window and enter the address that is shown at the end of startup. The login page is displayed.
2. Enter the default user ID and password.
3. The default login is at an administrative level.
4. One of your first tasks as an administrator is to change the administrative password and to register other users with other levels of permission.

Validate the sample business process

Procedure to Validate the Installation by Testing a Sample Business Process

1. From the Administration Menu, select Business Process > Manager.
2. In the Process Name field, enter Validation_Sample_BPML and click Go!.
3. Click execution manager.
4. Click Execute.
5. Click Go! The Status: Success message is shown in the upper left side of the page.

Verify the server running in cluster mode

Procedure to Verify that the Cluster is running from the User Interface (UI)

1. From the UI, from the Administration Menu, select Operations > System > Troubleshooter. Ensure you can view the Queue information for each node.
2. From the UI, from the Administration Menu, select Operations > System >Troubleshooter. Ensure you can view the JNDI Tree for each node.
3. From the UI, from the Administration Menu, select Operations > System >Troubleshooter. Ensure you can view the host, state, status, adapters, and memory usage information for each node.
4. From the UI, from the Administration Menu, select Operations > System > Troubleshooter. Ensure you can view the adapter status for each node.

Installation and Configuration

Validate the installation

Stop a server

Procedure to Stop Sterling Integrator in a Windows Environment

1. Go to \install_dir\install\bin by using one of the following methods:
    - For Windows Server 2003 or earlier:
        - Open a command prompt window (from the run dialog box).
    - For Windows Server 2008:
        - Click Start.
        - Right-click Command Prompt and select Run as administrator.
        - The Administrator: Command Prompt dialog box is shown.

Enter StopWindowsService.cmd. The system shows a message that services are stopped. Services include Noapps, Opsserver, WebDAV, and Database-related service.

You can stop a single node Sterling B2B Integrator in a Windows cluster environment.

Procedure to Stop a Node in a Windows Cluster Configuration (Run a hardstop)

1. Go to \install_dir\install\bin by using one of the following methods:
    - For Windows Server 2003 or earlier:
        - Open a command prompt window (from the run dialog box).
    - For Windows Server 2008:
        - Click Start.
        - Right-click Command Prompt and select Run as administrator.
        - The Administrator: Command Prompt dialog box is shown.
2. Enter StopWindowsService.cmd.
3. Enter your passphrase. You can also complete the task by selecting Operations > System > Troubleshooter.
4. Click the shutdown link for the node you want to stop.

Validate the installation

Restart the server

Procedure to restart the Entire Cluster in a Windows Environment

1. Go to \install_dir\install\bin by using one of the following methods:

    ■ For Windows Server 2003 or earlier:

        – Open a command prompt window (from the run dialog box).

    ■ For Windows Server 2008:

        – Click Start.

        – Right-click Command Prompt and select Run as administrator.

        – The Administrator: Command Prompt dialog box is shown.

2. Enter startWindowsService.cmd restart.

If you need to release all the locks in a cluster and both nodes are down, use the restart parameter for Node 1. The restart parameter can be used only on Node 1. It cannot be used on any other nodes.

For example:

For Node 1, enter: startWindowsService.cmd restart

For Nodes 2 and higher, enter: startWindowsService.cmd

Post installation configuration

Introduction

Complete the post installation configuration checklist as stated in the table:

	Checklist	Note
1	For security purposes, change all default user ID passwords immediately after installation is completed. See the Update My Account information task in the documentation library.	
2	Configure ActiveMQ for a cluster environment.	
3	Download Sterling B2B Integrator tools.	
4	Determine whether you need to modify any Property Files.	
5	Configure Shared file system as Document Storage.	
6	Add host[port] from all the nodes to the jgroups_cluster.property.in for each node.	
7	Configure Customer Overrides File with a Firewall between Nodes.	

Download Sterling B2B Integrator tools

Sterling B2B Integrator includes tools that run on a desktop or personal computer.

After you install Sterling B2B Integrator, you can install the following tools:

- Map Editor and associated standards
- Graphical Process Modeler (GPM)
- Web Template Designer
- (If licensed) MESA Developer Studio plug-ins, including, MESA Developer Studio Software Development Kit (SDK) and MESA Developer Studio Skin Editor.
- (If licensed) Reporting Services: This tool requires MESA Developer Studio if you want to use the plug-ins to create fact models and custom reports. Conflicting IP addresses can cause problems when you download a desktop tool.

Post installation configuration

Property file configuration

Property files contain properties that control the operation of Sterling B2B Integrator. For example, the REINT_DB property in the sandbox.cfg file controls whether a database is initialized when you install Sterling B2B Integrator. By modifying the values of these properties, you can customize the Sterling B2B Integrator to suit your business and technical needs. Most property files are in the *install_dir*\\install\\properties directory.

After Sterling B2B Integrator installation, most property files and scripts do not need

any further configuration for basic operation. However, if you want to customize any specific operations, for example, setting a different logging level - you need to edit (or in some cases, create) certain property or .xml files.

Configure shared file system or database

Procedure to Configure the Shared File Systems as Document Storage (Windows Cluster)

1. Go to *install_dir*\\install\\properties by using one of the following methods:
   - For Windows Server 2003 or earlier:
     – Open a command prompt window (from the run dialog box).
   - For Windows Server 2008:
     – Click Start.
     – Right-click Command Prompt and select Run as administrator.
     – The Administrator: Command Prompt dialog box is shown.
2. Open the jdbc.properties.in file.
3. Update the value of the document_dir attribute to point to the shared files system directory where you store documents.
4. Save and close the file.
5. Enter setupfiles.cmd.
6. Restart Sterling B2B Integrator.

Note ───

The default storage for all of the workflows is set to database.

WebSphere MQ File Transfer Edition

Introduction

Sterling B2B Integrator can be configured to integrate with IBM WebSphere MQ File Transfer Edition networks. Sterling B2B Integrator can be configured to transfer files in and out of WebSphere MQ File Transfer Edition Network. It does not require Sterling File Gateway for the integration. Integration is done by configuring the services and adapters that exist in Sterling B2B Integrator. The several tasks that need to be completed to configure Sterling B2B Integrator to transfer files with WebSphere MQ File Transfer Edition. To complete the tasks, you need to work with the WebSphere MQ File Transfer Edition administrator to determine what files are transferred and what tasks are done with the files. This information is used to configure the Sterling B2B Integrator.

The list of tasks that needs to be configured on Sterling B2B Integrator to work with WebSphere MQ File Transfer Edition includes:

1. Create or configure an existing Sterling B2B Integrator Adapter Container.
2. Create or identify existing Sterling B2B Integrator user accounts, mailboxes, virtual roots, and permissions to use in the transfers.
3. Create an FTP Server adapter instance for WebSphere MQ File Transfer Edition integration.
4. Create or modify an existing WMQFTE User Map.
5. Create a WebSphere MQ File Transfer Edition Agent adapter instance.
6. Create a WebSphere MQ File Transfer Edition Create Transfer Service instance. If you are not going to generate transfer requests (inbound or outbound) from business processes, you do not need to do this step.

For more information, refer:

https://www.ibm.com/support/knowledgecenter/SS4TGX_2.2.0/com.ibm.help.wsmq_fte_integration.doc/SI_WorkWithFTEAdminToConfigSI.html
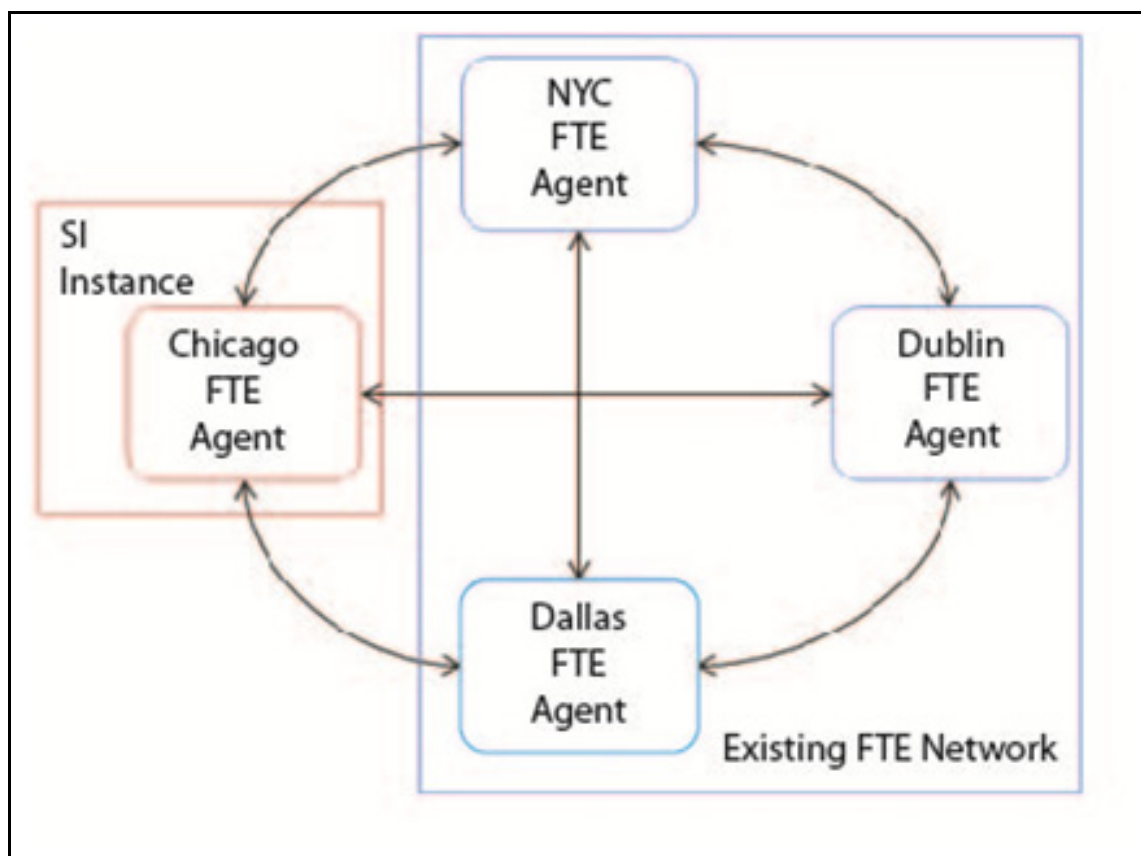
WebSphere MQ File Transfer Edition

Example

The information needs to be exchanged with the WebSphere® MQ File Transfer Edition administrator. Example has a sample, existing WebSphere MQ File Transfer Edition network with which Sterling B2B Integrator integrates. The specific files transfers to different mailboxes in Sterling B2B Integrator and then to different locations in the WebSphere MQ File Transfer Edition network.

The screen capture depicts the Sterling B2B Integrator is integrating with an existing WebSphere MQ File Transfer Edition network that has three agents in three cities: Dallas, Dublin, and New York City. The Sterling B2B Integrator instance in Chicago that must integrate with the network.

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WebSphere MQ File Transfer Edition

Example

The network activity requires three different sets of transfers:

- Invoice files that are generated in New York must be sent to the Sterling B2B Integrator instance in Chicago. Sterling B2B Integrator must be configured to process all invoice files arrive in the /Widgets/Invoices mailbox.

- Ship notifications generated in both Dublin and Dallas must be sent to the B2B Integrator instance in Chicago. Sterling B2B Integrator must be configured to process ship notification files arrive in /Widgets/Shipping/Dublin and /Widgets/Shipping/Dallas mailboxes.

- Payment notifications that are received by the Sterling B2B Integrator instance in Chicago must be sent to New York. Sterling B2B Integrator must be configured to deposit all payment notification files into the mailbox /Widgets/Payments.

- The Sterling B2B Integrator and WebSphere MQ File Transfer Edition to work together, agent and server adapters need to be created on Sterling B2B Integrator. The WebSphere MQ File Transfer Edition Agent Adapter must run in an Adapter Container.

- The Adapter Container must be created before the creation of any adapters because the location node and adapter container details are required for creating these adapters.

Adapter Container

Introduction

Adapter availability is the key to measuring Sterling B2B Integrator stability. Activities that prevent an adapter from being available can affect the ability to do business.

You can choose to run adapters in a separate Java Virtual Machine (JVM), which in turn increases the adapter availability. The adapter is loosely coupled to Sterling B2B Integrator via the database and the Java Message Service (JMS).

By running adapters in a separate JVM, you can:

- Isolate adapters from engine failure.
- Isolate engine from adapter failure.
- Isolate one adapter failure from another adapter.
- Separate lifecycle for adapters.
- Receive data for adapter even if engine application server-independent virtual machine (ASI VM) is down, but the database must be up.

You can run adapters in a separate JVM by creating an adapter container JVM. The adapter container JVM acts like a cluster node, but with limited functions. If you are running Sterling B2B Integrator in a single node environment, the adapter container JVM is listed as a cluster node.

Similarly, if the Sterling B2B Integrator in a cluster environment is executed. It is listed as a node along with other nodes, but you cannot schedule a business process to run in the adapter container JVM.

The following adapters can be run in a separate JVM by creating an adapter container JVM:

- FTP
- FTPS
- SFTP
- HTTP
- HTTPS
- Sterling Connect:Direct

Adapter Container

Set up Adapter Container

The database is up and running to set up an adapter container JVM as database is updated to set up adapter container. The database connection parameters are the same as ASI node. However, you can modify the database connection parameters by overriding them in the customer_overrides.properties file in the container node properties directory. The container node properties can be in the install_dir/ install/properties/node*AC* directory, for example install_dir/install/properties/node1AC1.

Every application server-independent (ASI) node and container node contains customer_overrides.properties file. You must update the customer_overrides.properties file in the respective nodes to apply or override any changes.

You update customer_overrides.properties file based on the order in which you set up the container node:

■ If you create or update the customer_overrides.properties file in the ASI node before the container node is set up, the properties added into the customer_overrides.properties file of the ASI node would be automatically added into the customer_overrides.properties file in the container node.

■ If you create or update the customer_overrides.properties file in the ASI node after the container node is set up, the properties added into the customer_overrides.properties file of the ASI node is manually added into the customer_overrides.properties file in the container node.

📝 Note

When container nodes is configured, ensure that you have sufficient hardware resources. You can increase this value if the container that hosts the adapter is processing a large amount of data. Use the Performance Tuning wizard and change the Maximum Heap Size to at least 1024 MB. If you use the SUN JVM, set the Maximum Permanent Generation Size to at least 256 MB.

Adapter Container

Set up Adapter Container ....(Continued)

Set Up Adapter Container on Windows

To set up an adapter container JVM and install it as a service in Windows:

1. Go to the install_dir\install\bin directory.

2. Perform this step, to set up the adapter container independently later without shutting down the system. If an ASI node is up, run stopWindowService.cmd command to stop it.

   Run startCluster.cmd 1 false command.

   Skip this step and go step 3 if you are:

   a. Running Sterling B2B Integrator in a cluster environment.

   b. Migrate Sterling B2B Integrator to a cluster environment at least one adapter container.

   c. Add more adapter containers after one adapter container is set.

3. Set up the adapter container by running setupContainer.cmd containerNumber command.

The containerNumber is the adapter container node number. For example, if you run setupContainer.cmd 2 on Sterling B2B Integrator node2, then the adapter container name is node2AC2.

(Continued on next page)

Adapter Container

(Continued)

Start Adapter Container in Windows

Start Adapter Container: Windows

To start an adapter container JVM in Windows, run one of the following commands from the install_dir\install\bin directory:

To start the Sterling B2B Integrator and all configured adapter container JVMs, run;

    startWindowsService.cmd

To start all configured adapter container JVMs, run;

    startContainerWindowsService.cmd

To start specified adapter container JVM, run;

    startContainerWindowsService.cmd # (where # refers the container number)

To start noapp node, run;

    startASIWindowsService.cmd

Stop Adapter Container in Windows

Stop Adapter Container: Windows

To stop an adapter container JVM in Windows, run the following command from the install_dir\install\bin directory:

To stop all adapter container nodes, run;

    stopContainerWindowsService.cmd

Note ───

If you run stopWindowsService.cmd command, it stops Sterling B2B Integrator and all configured adapter container JVMs.

───

To stop a specific adapter container node, run

    stopContainerWindowsService.cmd # (where # refers to the container JVM number)

To uninstall and reinstall a specific adapter container JVM as a Windows service, run the following command from the install_dir\install\bin directory:

    UninstallContainerWindowsService.cmd # (where # refers to the container JVM number)

For more information refer:

https://www.ibm.com/support/knowledgecenter/SS3JSW_5.2.0/com.ibm.help.manage_svcs_adpts.doc/SetupAdptCntnr.html

Lesson review

What you have been able to do

After completing this lesson, you should have been able to:

- Maintain installation checklist.
- Install Sterling B2B Integrator on your workstation.
- Validate the installation.
- Configure the installation for a Windows Cluster Environment.
- Describe the methods to set up, monitor, and start and stop the Adapter containers.