Sterling Integrator®

Connect:Direct Interoperability

Version 5.0

Sterling Commerce
An IBM Company

Contents

Chapter 4 Configuring Sterling Integrator and Connect:Direct for Interoperability 36

Chapter 5 Node Communication for Connect:Direct Interoperability   46

Chapter 6 Tracking Activities in Connect:Direct Interoperability   54

Chapter 7 Troubleshooting Connect:Direct Interoperability   60

Chapter 1

Overview of Connect:Direct Interoperability

Interoperability between Sterling Integrator and Connect:Direct brings the strengths of both products together. Connect:Direct enables large scale, multi-platform reliable and secure data exchange. Sterling Integrator enables business process modeling and content-based routing using traditional and emerging industry standards. Interoperability enables a Connect:Direct network to efficiently access the advanced integration capabilities of Sterling Integrator.

Connect:Direct customers can use Sterling Integrator to extend internal and external processes to the vast array of EAI and B2B adapters available with Sterling Integrator business process flows.

This section covers the following topics:

✦ About Sterling Integrator and Interoperability with Connect:Direct

✦ About Connect:Direct and Interoperability with Sterling Integrator

✦ Terminology with Connect:Direct Interoperability

✦ Capabilities with Sterling Integrator and Connect:Direct Interoperability

✦ System Requirements for Connect:Direct Interoperability

✦ Licensing Requirements for Connect:Direct Interoperability

About Sterling Integrator and Interoperability with Connect:Direct

Sterling Integrator is a business process-centric transaction engine for modeling and managing business processes. It supports high volume electronic message exchange, complex routing, translation and flexible integration, and real-time interaction with multiple internal systems and external business partners.

Sterling Integrator processing is based on industry standards:

✦ Business processes are created and run based on the Business Process Modeling Language (BPML), a metalanguage for the modeling of business processes.

✦ Internet communications protocols (HTTP, FTP, e-mail) meet industry standards.

✦ B2B management, packaging, and communications protocol standards are supported (ebXML, AS1, AS2, EDIFACT, ANSI X12).

✦ Security standards are supported (X.509 certificates, SSL, PGP, LDAP, Single Sign On, digital signatures, data encryption).

Using Sterling Integrator for modeling and managing business processes, you can automate system-to-system business document exchanges such as purchase orders, invoices, shipment notifications, and many other document types, depending on business needs and required protocol standards.

Sterling Integrator Services and Adapters

Activities carried out in Sterling Integrator are performed by services and adapters. An adapter is a type of service that communicates with systems outside of Sterling Integrator. There are many types of adapters, each type intended for use with a specific external system, for example, the Connect:Direct Requester adapter. When you configure an adapter, you create a unique instance of that type of adapter. Because adapters move data into and out of Sterling Integrator, you may need to have multiple instances (configurations) of one type of adapter.

Example: The Connect:Direct Requester adapter implements the protocol that enables Sterling Integrator to send instructions to a remote Connect:Direct node. You may need to have multiple instances of this adapter to accommodate multiple remote nodes or high volumes of communications.

A service is a component that carries out an activity within a business process. Like adapters, when you configure a service, you are creating a unique copy of the service (a service configuration) for which you have defined specific parameters. One type of service can have many service configurations. Each service configuration must have a unique name. Multiple business processes can use one service configuration simultaneously.

Example: The Connect:Direct Requester Submit Process service tells the Requester adapter to submit a Process on a remote Connect:Direct node. Configuration parameters for this service include the PNODE, the SNODE, and Priority.

Two adapters in Sterling Integrator enable interoperability with Connect:Direct. The Connect:Direct Server adapter and the Connect:Direct Requester adapter provide a suite of services specifically for use in business processes that perform operations with Connect:Direct nodes.

Sterling Integrator Concepts and Components

The following table defines components that are important for interoperability:

Concepts and Components	Description
Business Process	A *business process* is a sequence of steps that businesses carry out to achieve a goal.
	For example, an online bookseller has a business process: *process customer book order.* This involves a number of steps, or activities, such as checking the inventory system for stock, informing the warehouse to package a book, arranging for shipping, and so forth.

Concepts and Components	Description
Business Process Modeling Language	Business Process Modeling Language (BPML) is an XML-based language for describing and executing business processes. BPML is sufficiently powerful to express most EAI, B2B integration, and associated user interface interaction. Services and adapters are rendered in BPML.
Correlation Records	*Correlation records* enable tracking business processes and documents based on related identifiers such as: document ID, business process ID, Mailbox ID. This functionality is similar but not identical to Connect:Direct Select Statistics and Select Process.
Sterling Integrator Mailbox	The Sterling Integrator Mailbox is a business document repository that enables you to organize, store, and manage trading partner documents and transactions. This functionality is useful when data is produced by internal systems when trading partner systems are unavailable or requests are received from trading partners outside of processing windows.

About Connect:Direct and Interoperability with Sterling Integrator

Connect:Direct is a peer-to-peer file-based integration system optimized for assured delivery, high volume and secure data delivery within and between enterprises. It is optimized for high performance and moves files containing any type of data (text, EDI, binary, image) across multiple platforms, disparate file systems and disparate media (tape, disk).

Connect:Direct automates and secures file transfer between applications within the enterprise and with external business partners. Predefined file transfers can be scheduled for one-time or recurring execution, and can be easily integrated with your existing automated operations or scheduling systems. Extensive recovery features help to assure reliable data delivery in support of 24x7 business operations. Extensive statistics logs provide a complete audit trail and diagnostic information.

Connect:Direct is installed on a wide range of platforms such as mainframe, UNIX, or Windows server, as well as the desktop, providing seamless data delivery across platforms, to communicate with other Connect:Direct sites in the business network.

Connect:Direct Concepts and Components

The following table defines components that are important for interoperability:

Concepts and Components	Description
Connect:Direct Process	A *Process* is a collective unit of work. Steps in each work unit are defined using a scripting language unique to Connect:Direct.
	A Connect:Direct Process is composed of statements and is stored in a file with the extension .cdp (Windows). A Process is initiated with a *Submit Process* command.
	Note: The Sterling Integrator business process is a .bp file. A business process can initiate a session with a Connect:Direct server to submit a Process, or a Process can initiate a session with Sterling Integrator and initiate a business process.
Connect:Direct Process Language	The Connect:Direct Process language consists of *statements* and *parameters* that provide instructions for initiating activities such as:
	◆ Copying files between systems (nodes)
	◆ Running jobs, programs, and commands
	◆ Handling error situations through conditional logic
	◆ Starting another Process
Connect:Direct Commands	In Connect:Direct, you use *commands* to submit, monitor, and control the execution of Processes. The most commonly used commands in Connect:Direct are:
	◆ Select Process - displays or prints information about a Process.
	◆ Select Statistics - displays or prints statistics from a statistics log.
	◆ Submit - starts a Process on a remote Connect:Direct node.
Nodes	A node is a Connect:Direct server. Two Connect:Direct servers (local and remote) function together to perform data transfers. Either node can initiate the work by submitting a Process.
	During the transfer of data, the Connect:Direct server where the Process is initiated is the primary node (PNODE) and the secondary node (SNODE) is the partner node.
	When a session is established, the node that initiates the session is the PNODE regardless of the direction of information flow. The other is the SNODE. The Process can specify work destined for either the PNODE or SNODE.
	Note: Sterling Integrator can be a Connect:Direct local or remote node and can function as a PNODE or an SNODE.
Network Map	Connect:Direct identifies the remote nodes that the local node can communicate with through the use of a *network map* file, sometimes called a *netmap*.
	The network map includes the names of all the remote nodes that the Connect:Direct local node can communicate with, the paths to contact those remote nodes, and characteristics of the sessions for communication.
	Note: When Sterling Integrator is a Connect:Direct node it must have a network map to identify the remote nodes it can communicate with. You add nodes to a network map when you configure the Connect:Direct Server adapter in Sterling Integrator.
	Note: The term *map* is used in Sterling Integrator for files that describe how to map one data type to another data type. These are also called *translation maps* and should not be confused with network maps.

Terminology with Connect:Direct Interoperability

In Connect:Direct, you refer to the data transferred between systems as *files*. However, when files are copied to and stored in a Sterling Integrator Mailbox, you refer to the files as *messages*. Messages are assigned to a mailbox with a name and timestamp. Business processes use services and adapters to add, extract, query, and delete messages. When files are copied to or from a business process, they are referred to as documents in Sterling Integrator.

When you perform activities on a message in a Sterling Integrator Mailbox and use the data in a business process, you refer to the message body as a *business document*.

Within a business process, while data is being operated on (for example, moved, copied, translated, altered), the data is called the *primary document*. All the shared data within a business process while it runs is called *process data*. The primary document is a subset of the process data and may change during the business process, depending upon the actions of the business process.

Capabilities with Sterling Integrator and Connect:Direct Interoperability

Sterling Integrator and Connect:Direct work together to enable your company to easily communicate between applications internally and externally with remote business partners.

You can use Sterling Integrator and Connect:Direct to securely copy large files and exchange data between the two applications in a near seamless environment, and create automated business processes to interact on the data sent to Sterling Integrator.

Sterling Integrator acts as an entry point that allows you to tie into the tightly integrated Sterling Integrator environment, which includes:

✦ Bulk data transfer with advanced platform capabilities to move data more efficiently than simple file handoffs

✦ Connect:Direct transport protocol in the Connect:Direct Server adapter

✦ Data transformation

✦ Graphical Process Modeling

✦ Bi-directional monitoring visibility

✦ Bi-directional process initiation

✦ Extended file tracking through shared process identifiers

✦ Access to a broader set of business level protocols such as ebXML, SOAP, and Rosettanet

✦ Routing decisions based on content

✦ Automated business processes triggered by file movement

System Requirements for Connect:Direct Interoperability

The Sterling Integrator Connect:Direct Server adapter is compatible with the following versions of Connect:Direct:

✦ Connect:Direct Windows 4.1 (with patch 26) or later

✦ Connect:Direct UNIX 3.5 (with patch dated 28Aug03) or later

✦ Connect:Direct OS/390 4.4 or later

✦ Connect:Direct OS/400 3.5 or later

✦ Connect:Direct Select 1.0 or later

✦ Connect:Direct HP Non-Stop 3.4 or later

Connect:Direct Server adapter is supported on all platforms that support Sterling Integrator. Third party jar file CDJava.jar, which is included with Sterling Integrator, is required.

Licensing Requirements for Connect:Direct Interoperability

You must have appropriate adapter licensing to use one or more instances of the Connect:Direct Server adapter and the Connect:Direct Requester adapter.

Activate your Sterling Integrator license file, if required, from the Sterling Commerce Self-Service Licensing Web site at www.productupdates.stercomm.com.

The Sterling Integrator Mailbox option enables you to copy and store files in personal mailboxes in Sterling Integrator for later retrieval or to initiate Sterling Integrator business processes. To use the Sterling Integrator Mailbox option, you must have appropriate mailbox licensing.

How Connect:Direct Interoperability Works

Sterling Integrator uses two adapters to communicate with Connect:Direct: The Connect:Direct Server adapter and the Connect:Direct Requester adapter. The Server adapter functions as both PNODE and SNODE in the Connect:Direct network, initiating and responding to Connect:Direct transfer requests. The Requester adapter functions as a client that sends requests to Connect:Direct nodes.

Interoperability extends the functionality of Connect:Direct by allowing any Connect:Direct node to make use of the power of business processes by sending files to and receiving data from Sterling Integrator.

This section covers the following topics:

✦ System Diagram for Connect:Direct Interoperability

✦ Connect:Direct Server Adapter

✦ Connect:Direct Requester Adapter

✦ Perimeter Servers for Connect:Direct Interoperability

System Diagram for Connect:Direct Interoperability

Within Sterling Integrator, the Connect:Direct Server adapter and the Connect:Direct Requester adapter provide specific services for use in business processes. Connect:Direct Server adapters can communicate through a perimeter server, which manages communication with the Connect:Direct Server, enabling business interaction between Enterprise A and Enterprise B.

The following figure shows a high-level view of how the Sterling Integrator application located at Enterprise B and Connect:Direct at Enterprise A work together to exchange information between enterprises:
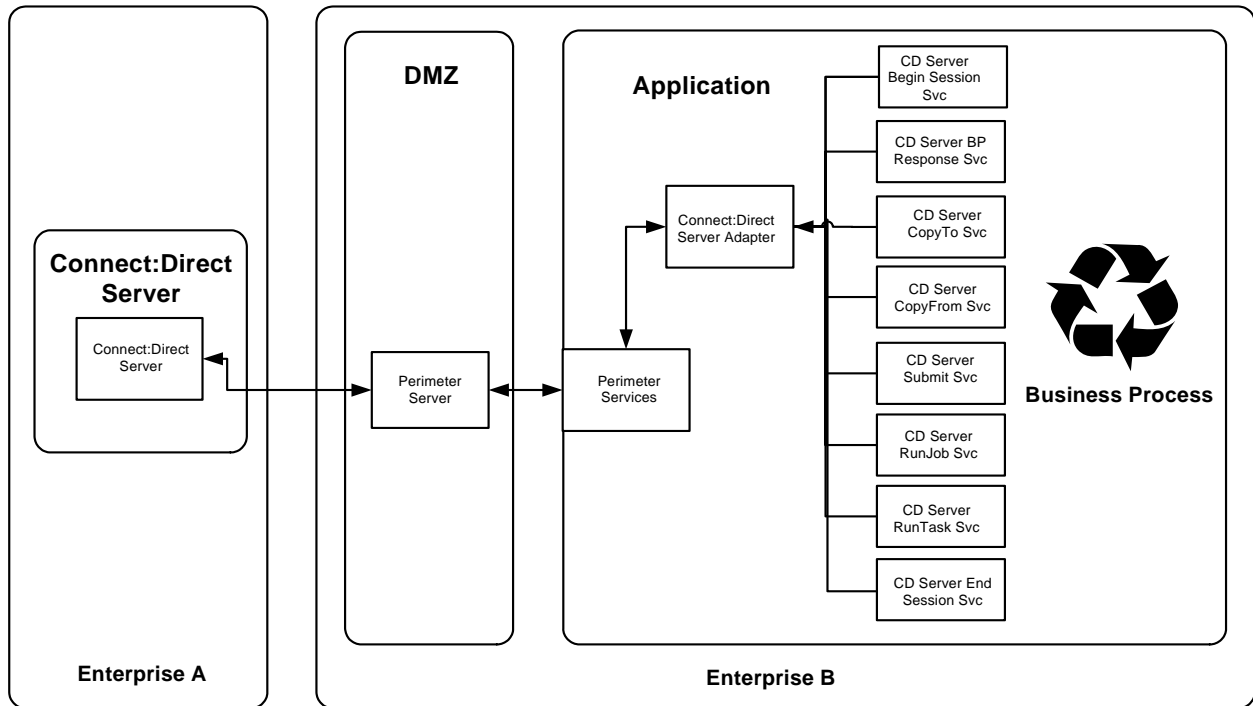
Inter-Enterprise

Connect:Direct Server adapters and Connect:Direct Requester adapters can also be used to exchange transactions with Connect:Direct servers within an enterprise.

The following figure shows how Connect:Direct and the Sterling Integrator application can be used within an enterprise:
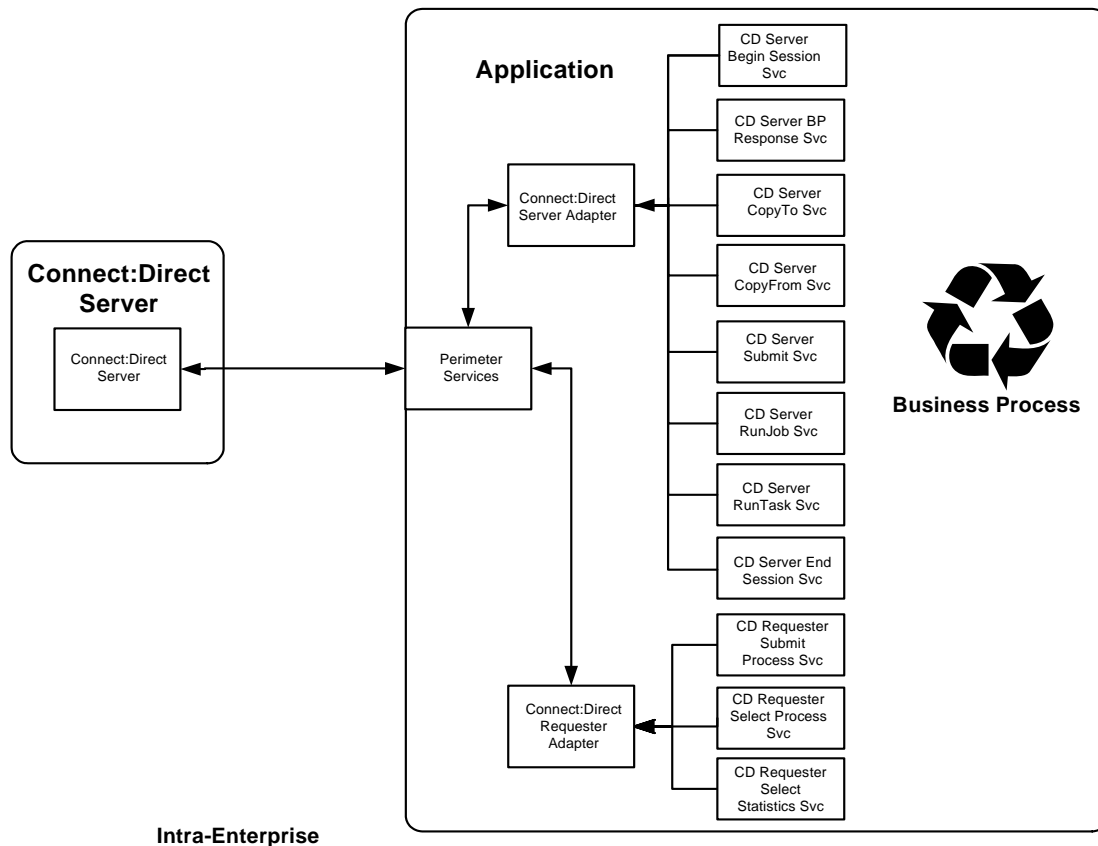
Connect:Direct Server Adapter

The Sterling Integrator Connect:Direct Server adapter (Server adapter) is an implementation of the proprietary Connect:Direct communications protocol. The adapter appears as a Connect:Direct node within a Connect:Direct network. The adapter supports both PNODE and SNODE processing functions of a Connect:Direct server. The communication is bi-directional. An external Connect:Direct node can make requests to this adapter and the adapter can make Connect:Direct server level requests to external Connect:Direct nodes. The Server adapter cannot accept requests from a Requester adapter.

The functions that you can perform between Connect:Direct nodes include copying files, submitting other Processes, running jobs, or running tasks.

Secure Point Of Entry (SPOE) support as a PNODE

Connect:Direct has an optional security configuration called Secure Point of Entry (SPOE). To increase security when communicating with known and expected nodes, a Connect:Direct server acting as an SNODE is configured to accept an inbound connection from a designated NodeName. Connections are made with PNODE userid's that are known to the SNODE and authenticated by the PNODE. SPOE uses the process PNodeId to map to a local operating system userid for any necessary authorizations. Sterling Integrator supports SPOE as a PNODE and automatically supplies the Sterling Integrator user executing the business process as the PNodeId.

Sterling Integrator also supports Connect:Direct User Proxies as a PNODE whereby the business process can designate a RemoteUserId and not provide a RemotePassword.

Secure Point Of Entry (SPOE) support as an SNODE

The Connect:Direct Server adapter can be the SNODE and accept inbound requests from remote Connect:Direct PNODES with SPOE. SPOE maintains the privacy of sensitive user account information by associating a pseudo account with an authentic one. Remote Connect:Direct trading partners establish sessions using pseudo accounts rather than authentic ones. SPOE is disabled by default.

Enable SPOE Authentication from Remote Connect:Direct PNODEs

SPOE policy can be modified while Sterling Integrator is running. To enable SPOE authentication:

1. Modify the cdinterop-spoe-policy.properties file. This file is located in the following directory:

   install_dir/properties

2. Uncomment the spoe.policy=yes property.

3. Modify other settings in the cdinterop-spoe-policy.properties file necessary for your situation.

See *Using Property Files*.

Upload and Download Parameters in User and Proxy Repositories

Upload and download parameters can be used to designate where to store incoming files and retrieve outgoing files, whether sent by a remote node or requested by a local node. These can be configured for local users or (if SPOE authentication is implemented) for proxy accounts in the cdinterop-user-records.properties and cdinterop-proxy-records.properties files, respectively.

The following examples show how the parameters are used in four situations:

✦ Sterling Integrator as PNODE initiates a transfer TO a remote Connect:Direct server as SNODE

✦ Sterling Integrator as PNODE initiates a transfer FROM a remote Connect:Direct server as SNODE

✦ Connect:Direct server as PNODE initiates a transfer TO Sterling Integrator as SNODE

✦ Connect:Direct server as PNODE initiates a transfer FROM Sterling Integrator as SNODE

Sterling Integrator Initiates Transfer to Connect:Direct

```
cdinterop-user-records.properties
cduser1 [CDSA.DALLAS] upload=/mailbox/out
cduser1 [CDSA.DALLAS] download=/mailbox/in
admin [CDSA.DALLAS] download=/mailbox/download
admin [CDSA.DALLAS] upload=/mailbox/upload
```

```
CopyTo BP
<operation name="CD Server CopyTo Service">
  <participant name="CDServerCopyTo"/>
  <output message="CDServerCopyToServiceTypeInputMessage">
    <assign to="RemoteFileName">payload.txt</assign>
    <assign to="." from="*"></assign>
  </output>
  <input message="inmsg">
    <assign to="." from="*"></assign>
  </input>
</operation>
```

Application
PNODE
CDSA.DALLAS
User: admin

CopyTo
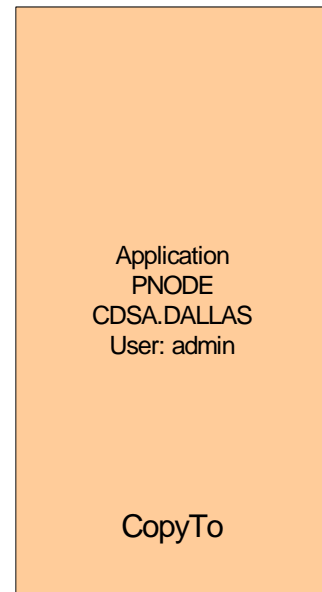
NOTE: The application obtains the source file via the document ID (no directory parameter processing is involved)

Connect:Direct computes the destination filename by appending the local filename `payload.txt` to user `cduser1`'s download parameter value:
Result: `C:\Connect Direct\data\download\payload.txt`

Edit User **cduser1** for CD.CHICAGO

Main | Directories | Admin | Overrides

Directory Restrictions

Upload: `C:\Connect Direct\data\upload` ...

Download: `C:\Connect Direct\data\download` ...

Process: ...

Program: ...

OK | Cancel | Help

Connect:Direct
SNODE
CD.CHICAGO
User: cduser1

Sterling Integrator Initiates Transfer from Connect:Direct

```
cdinterop-user-records.properties
cduser1 [CDSA.DALLAS] upload=/mailbox/out
cduser1 [CDSA.DALLAS] download=/mailbox/in
admin [CDSA.DALLAS] download=/mailbox/download
admin [CDSA.DALLAS] upload=/mailbox/upload
```

```
CopyFrom BP
<operation name="CD Server CopyFrom Service">
  <participant name="CDServerCopyFrom"/>
  <output message="CDServerCopyFromServiceTypeInputMessage">
    <assign to="RemoteFileName">payload.txt</assign>
    <assign to="LocalDocumentName">po-12558-a202</assign>
    <assign to="." from="*"></assign>
  </output>
  <input message="inmsg">
    <assign to="." from="*"></assign>
  </input>
</operation>
```

Application
PNODE
CDSA.DALLAS
User: admin

CopyFrom
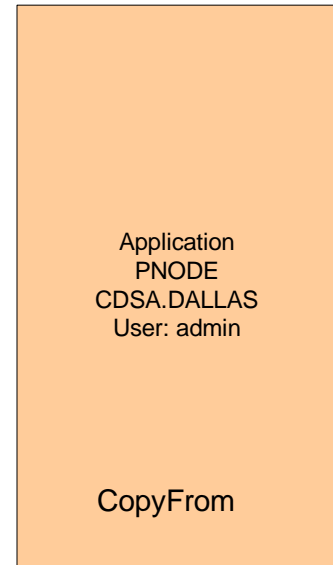
The application computes the destination filename by appending the local filename `po-12558-a202` to the `admin[CD.DALLAS]download` parameter value:
Result: `/mailbox/download/po-12558-a202`

Connect:Direct computes the source filename by appending the remote filename to user `cduser1`'s upload parameter value:
Result: `C:\Connect Direct\data\upload\payload.txt`
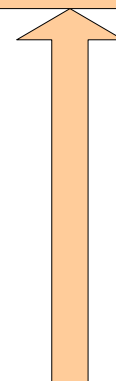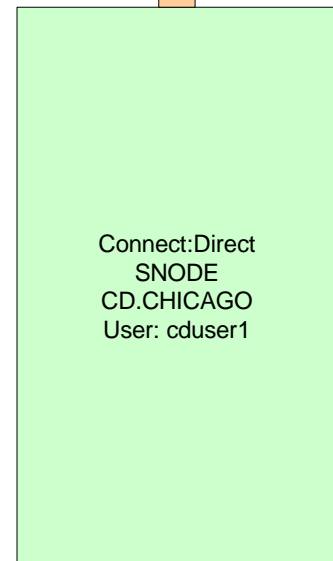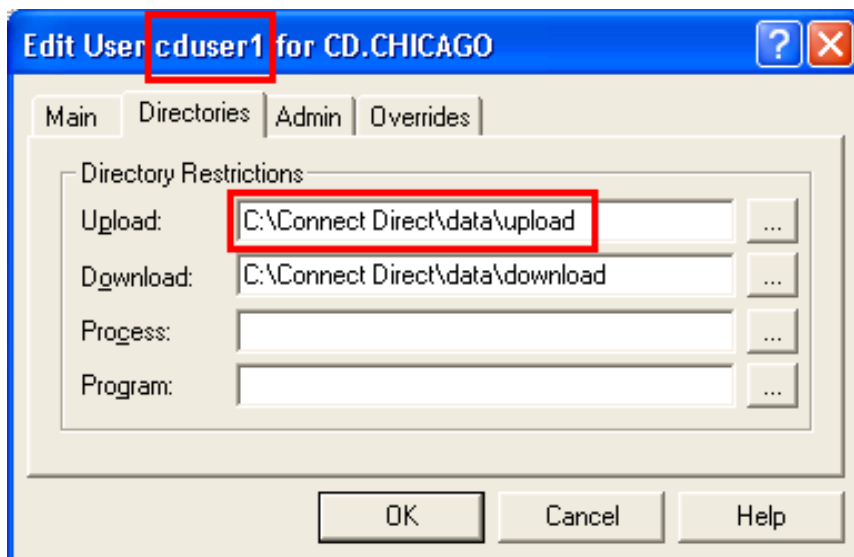
Edit User cduser1 for CD.CHICAGO

Main | Directories | Admin | Overrides

Directory Restrictions

Upload: `C:\Connect Direct\data\upload` ...

Download: `C:\Connect Direct\data\download` ...

Process: ___ ...

Program: ___ ...

OK | Cancel | Help

Connect:Direct
SNODE
CD.CHICAGO
User: cduser1

Connect:Direct Initiates Transfer to Sterling Integrator

```
cdinterop-user-records.properties
cduser1 [CDSA.DALLAS] upload=/mailbox/out
cduser1 [CDSA.DALLAS] download=/mailbox/in
admin [CDSA.DALLAS] download=/mailbox/download
admin [CDSA.DALLAS] upload=/mailbox/upload
```

Application
SNODE
CDSA.DALLAS
User: cduser1

The application computes the desitnation filename by appending the local filename `po-12558-a202` to the `cduser1[CDSA.DALLAS]download` parameter value:
Result: `/mailbox/in/po-12558-a202`

Connect:Direct computes the source filename by appending the local filename `payload.txt` to user `cduser1`'s upload parameter value:
Result: `C:\Connect Direct\data\upload\payload.txt`

```
TOGIS PROCESS
        SNODE=CDSA.DALLAS
        SNODEID=(cduser1,cduser1)

STEP1 COPY
        FROM (
                FILE="payload.txt"
        )
        TO (
                FILE="po-12558-a202"
                DISP=RPL
        )
PEND
```

Connect:Direct
PNODE
CD.CHICAGO
User: cduser1

Edit User **cduser1** for CD.CHICAGO

Main | Directories | Admin | Overrides

Directory Restrictions

Upload: `C:\Connect Direct\data\upload` ...

Download: `C:\Connect Direct\data\download` ...

Process: ...

Program: ...

OK | Cancel | Help

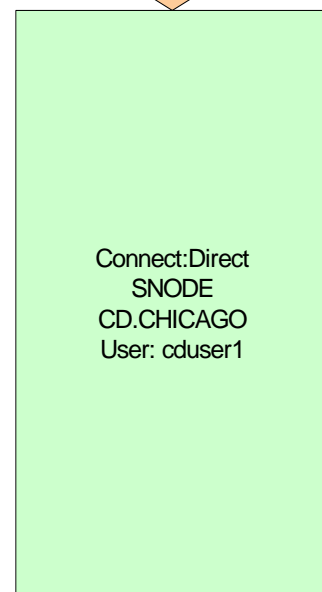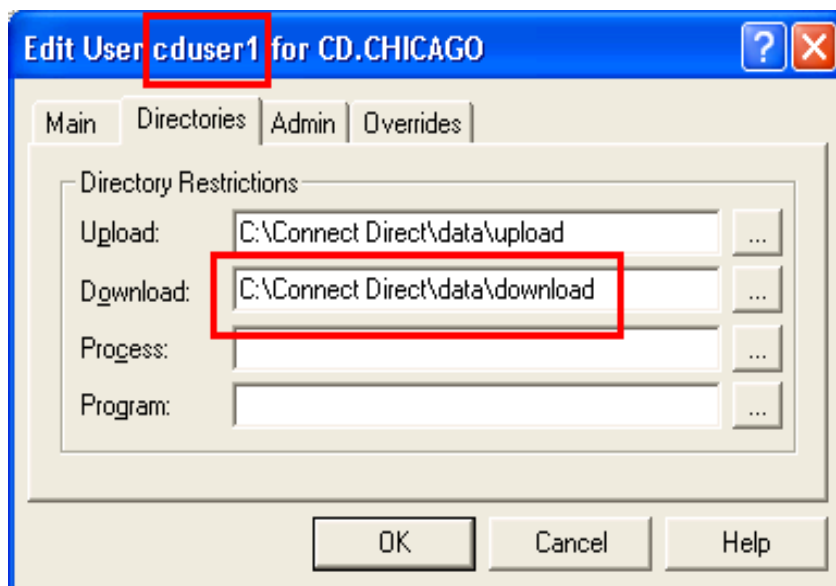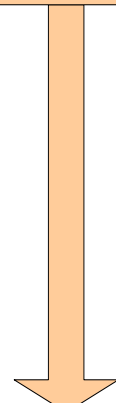## Connect:Direct Initiates Transfer from Sterling Integrator

```
cdinterop-user-records.properties
cduser1 [CDSA.DALLAS] upload=/mailbox/out
cduser1 [CDSA.DALLAS] download=/mailbox/in
admin [CDSA.DALLAS] download=/mailbox/download
admin [CDSA.DALLAS] upload=/mailbox/upload
```

Application
SNODE
CDSA.DALLAS
User: cduser1

The application computes the source filename by appending the local filename sample.txt
to the cduser1[CDSA.DALLAS]upload parameter value:
Result: /mailbox/out/sample.txt

Connect:Direct computes the source filename by appending the local filename payload.txt
to user cduser1's upload parameter value:
Result: C:\Connect Direct\data\download\payload.txt

```
FRMGIS PROCESS
        SNODE=CDSA.DALLAS
        SNODEID=(cduser1,cduser1)

STEP1 COPY
        FROM ( FILE=sample.txt
               SNODE
        )
        TO (    FILE=payload.txt
               PNODE
               DISP=RPL
        )
PEND
```
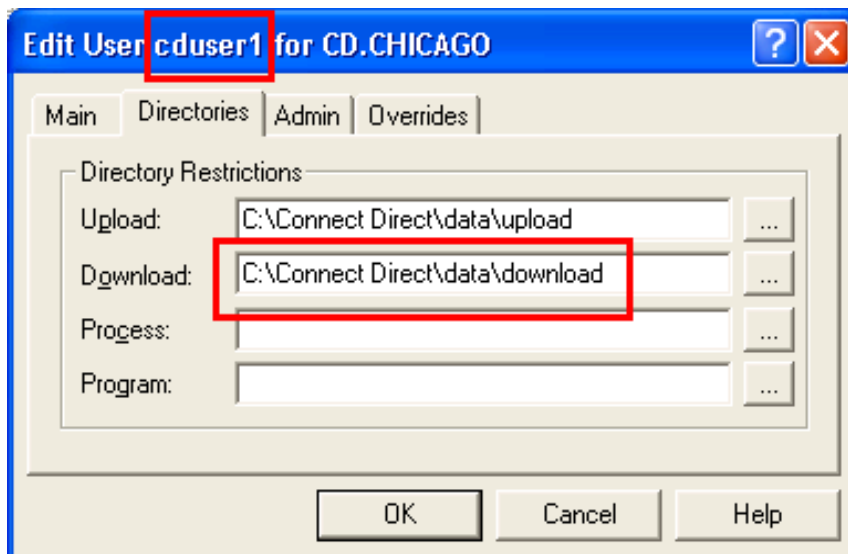
Connect:Direct
PNODE
CD.CHICAGO
User: cduser1

Edit User cduser1 for CD.CHICAGO

Main | Directories | Admin | Overrides

Directory Restrictions

Upload: C:\Connect Direct\data\upload ...

Download: C:\Connect Direct\data\download ...

Process: ...

Program: ...

OK   Cancel   Help
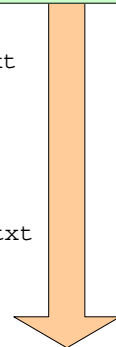
For configuration details and a table summarizing the search order for determining upload and download parameter values, see the *Connect:Direct Server Adapter*.

Connect:Direct Requester Adapter

The Sterling Integrator Connect:Direct Requester adapter (Requester adapter) is a client that submits Processes to a remote Connect:Direct node and monitors Processes and statistics of the remote node.

The Requester adapter can issue SUBMIT PROCESS, SELECT PROCESS, and SELECT STATISTICS commands from within a Sterling Integrator business process model. The results are returned in an XML structure which can be parsed using XML Path language (XPATH) or translated using the Sterling Integrator translator.

Note: The Connect:Direct Requester adapter with related services has replaced the Connect:Direct adapter, which has entered the retirement process.

Perimeter Servers for Connect:Direct Interoperability

A *perimeter server* is communications management software that is installed in a demilitarized zone (DMZ) of a company network. A perimeter server and its client manage communication flow between the perimeter network and the Sterling Integrator TCP-based transport adapters.

Note: Perimeter servers can be used without a DMZ.

The purpose of the perimeter server and perimeter services are:

✦ To minimize DMZ issues

✦ To enhance security and scalability for high-volume environments

✦ To enhance the handling of large files

✦ To improve performance and help reduce network congestion

Managing Perimeter Servers

A perimeter server and all adapters that use the perimeter server must be configured within a single installation of Sterling Integrator. If Sterling Integrator is deployed in a cluster, then the perimeter server and adapters must be configured in the same Sterling Integrator cluster node.

A single Sterling Integrator installation can have multiple configured perimeter servers associated with it. All adapters installed on a specific Sterling Integrator cluster node can use any perimeter server deployed on the cluster node.

Basic Operation

At Sterling Integrator system startup, a persistent connection is established from perimeter services out to a designated perimeter server in the DMZ. Adapters communicate with a perimeter server through designated perimeter services; adapters interface to perimeter services through an application programming interface (API). This arrangement has an additional security advantage in that the use of perimeter servers is restricted to Sterling Integrator adapters built for that purpose.

Note: Perimeter servers cannot be used with a third party Internet web server.

An adapter, through the perimeter services API, accesses the perimeter server through an inside firewall into the DMZ. The perimeter server, in turn, has connections through the outer firewall to external Internet connections.

Perimeter Services

Perimeter services is a security solution that enables you to deploy in a secure DMZ. You can use perimeter services in two modes, remote and local.

If you establish an outbound connection to a remote Connect:Direct node, and you want the remote proxy in the DMZ to handle connections for your adapter, then use perimeter services in remote mode. Otherwise, use the local mode.

When Sterling Integrator initiates an outbound connection, it requests that perimeter services provide the outbound connection to the IP address for the remote Connect:Direct node.

If the remote Connect:Direct node checks network maps, then it checks the Sterling Integrator authentication credentials, and either allows or rejects access accordingly.

When you use a remote perimeter services connection, the Connect:Direct node must have the perimeter services IP address in its network map to establish a connection.

Local Mode Operation

Local mode means that the adapter is operating without a DMZ. This is relevant for:

✦ An adapter configuration that is not communicating over the Internet (but is instead used for communications within an internal network).

✦ Where a DMZ is not needed for a particular application, such as a test environment.

✦ When you want to deploy perimeter network resident authentication for a Sterling Integrator system.

A local perimeter server is installed automatically with Sterling Integrator.

Remote Mode Operation

Remote mode refers to when you deploy the perimeter server in the DMZ. This is useful in the following cases:

✦ You require high volume, secure connections.

✦ You want the remote proxy in the DMZ to handle inbound and outbound connections for your Connect:Direct Server adapter.

If the remote Connect:Direct node is configured to check network maps, then it checks the Sterling Integrator authentication credentials, and allows or rejects access accordingly.When you use a remote perimeter services connection, the Connect:Direct node must have the perimeter services IP address in its network map to establish the connection.

To implement a perimeter server to manage communications with Connect:Direct in remote mode:

1. Install a perimeter server in a DMZ.

2. Add, configure and enable the perimeter server in Sterling Integrator through **Operations > Perimeter Servers**.

3. Confirm the perimeter server by selecting **Operations** > **System > Troubleshooter**. The System Troubleshooting page is displayed.

4. Scroll to the bottom of the page to the Perimeter Servers section. Verify that the perimeter server is installed and enabled.

Understanding Business Processes and Connect:Direct Services

This section provides information about Sterling Integrator business processes and the Connect:Direct services provided in the Connect:Direct Server adapter and the Connect:Direct Requester adapter.

This section covers the following topics:

✦ Business Processes and Connect:Direct Interoperability

✦ Graphical Process Modeler and Connect:Direct Stencils

✦ Using the Mailbox Option and Connect:Direct Interoperability

✦ Using Connect:Direct Services in a Business Process

✦ Sample Business Process Scenario for Connect:Direct Interoperability

Business Processes and Connect:Direct Interoperability

Connect:Direct and Sterling Integrator each have their own version of a *process*. Connect:Direct uses a Process statement to initiate a session with another Connect:Direct node and then uses specific statements to perform tasks and make requests on that node.

Sterling Integrator uses business process services to initiate a session with another Connect:Direct node to perform tasks and make requests on that node. However, you can also use Sterling Integrator automated business processes to handle complex processes such as order fulfillment, invoicing, inventory, and other processes that require data exchange and business integration.

These automated business processes enable you to transfer your files, or business documents, to internal processing activities and to trading partners, exchanges, and customers.

Graphical Process Modeler and Connect:Direct Stencils

The Graphical Process Modeler is a tool that enables you to create business processes in Sterling Integrator using drag-and-drop functionality. You can drag element icons onto the workspace to create your business process model. When you save the business process model, the Graphical Process Modeler converts the graphical representation of business processes to well-formed Business Process Modeling Language (BPML).

Download and Install the Graphical Process Modeler

To download and install Java Web Start and the Graphical Process Modeler, you must log in to Sterling Integrator using a login ID that has permission to create and manage business processes.

To download Java Web Start and install the Graphical Process Modeler:

1. From the Sterling Integrator Admin Console, in the Tools section, next to Java Web start, click the **Download** link.

2. In the **File Download** dialog box, select the **Open** option and click **OK**.

3. After reading the license agreement, click **Accept**.

4. In the installation Directory dialog box, accept all of the defaults and click **Next**.

5. If you receive a message that setup did not detect a usable Java 2 Runtime Environment, either accept the default installation directory or click **Browse** to select another installation directory, and then click **OK**.

   The **Installing Files** dialog box opens and displays the in-progress installation. When the installation is complete, the setup program prompts you to read the Readme file. Click **Cancel.**

6. Start the Graphical Process Modeler. Click **Go!**

Connect:Direct Stencils

The Graphical Process Modeler uses stencils to group related services which makes them easier to find and helps you understand which services and adapters to use, based on your business need. These stencils provide access to the service and adapter elements available in the Graphical Process Modeler that you use to create business processes.

Sterling Integrator offers a customized Connect:Direct stencil to use when you create business processes that include interaction with Connect:Direct nodes. The stencil includes elements for the services related to the Connect:Direct Server adapter and the Connect:Direct Requester adapter. Even though the Connect:Direct services are used in conjunction with the Connect:Direct adapters, the adapters themselves are not shown in the stencil because they cannot be included as operations in a business process.

To access the Connect:Direct stencils in the Graphical Process Modeler:

1. From the **View** menu, select **Stencil > Applications > Sterling Commerce > Connect:Direct**.

2. From the **File** menu, select **New** to start a business process.

3. In the left pane, click on **Connect:Direct**. A menu of element icons is displayed.

4. Drag the icons you want to use to the center pane.

5. Double-click the element icon to open the configuration pane.

Using the Mailbox Option and Connect:Direct Interoperability

You can copy files to a Sterling Integrator Connect:Direct node directly to a business process or to a mailbox.The optional mailbox enables you to organize, store and manage trading partner documents.

Although staging and scheduling of data transmission is present to varying degrees in numerous applications and infrastructure components, it is beneficial to centralize the definition, operation, management, and control of this staging and scheduling. In Sterling Integrator, these capabilities are centralized in the Mailbox.

You can set up mailboxes within Sterling Integrator so that files copied over to Sterling Integrator are stored and retrieved later. When the files are stored in a mailbox, they are referred to as messages. You can also use mailbox routing rules to initiate business processes in Sterling Integrator based on messages that are stored in a mailbox.

Sterling Integrator requires users to have permission to access a mailbox or start a business process.

Creating the Mailbox

To create a mailbox in Sterling Integrator:

1. If not previously done, assign a virtual root for the mailbox. See *Creating a Virtual Root* in the Mailbox guide.

2. In the Admin console, select **Deployment** > **Mailboxes** > **Configuration**.

3. In the Create section, click **Go!**

4. Complete the Name page as described in the following table, then click **Next**.

In this field	Type or select	Description
Parent Mailbox	/	The root mailbox is denoted by a slash (/). If other mailboxes exist, select the parent mailbox that you want to create the new mailbox under. You can type a partial name in the **Filter by Name** field and click the filter button for a filtered list. Required.
Name	*mailbox_name*	This name identifies the mailbox in Sterling Integrator. Required.
Description	Repository for Connect: Direct	Use this field to describe the mailbox. This field is not used by any other resource in the system. Required.

5. Groups in Sterling Integrator maintain permissions for several users from a single place. All groups in the Selected Groups list have permission to access this mailbox. Alternatively, you can add groups from the Accounts menu. Groups are optional. Click **Next** in the Assign Groups page.

6. All users in the Selected Users list have permission to access this mailbox. Alternatively, you can add user permissions for this mailbox from the Accounts menu. Associating users with a mailbox is optional. Click **Next** in the Assign Users page.

7. In the Confirm page, review the information and click **Finish**.

8. Click **Return**.

Establish Ownership for a Mailbox

This limits a user to a set of mailboxes, which ensures that access is limited when routing to mailboxes.

1. Create a user account with mailbox user permissions.

2. Create the mailbox that will be the root mailbox for this user.

3. Create any submailboxes for that root mailbox.

4. Assign the user account as virtual root to the root mailbox that you created.

Using Connect:Direct Services in a Business Process

The Connect:Direct Server adapter and the Connect:Direct Requester adapter provide a suite of B2B services to establish communication between Sterling Integrator and Connect:Direct.

Using these services, you can create automated business processes to perform the same tasks performed with Connect:Direct Processes and with Connect:Direct commands.

The Connect:Direct Server services correspond to the Connect:Direct Process Language. These services work with the Connect:Direct Server adapter. These services are used when the Server adapter is the PNODE.

The Connect:Direct Requester services correspond to the Connect:Direct Requester API and work with the Connect:Direct Requester adapter.

The services created specifically for use with Connect:Direct are described in the following sections, along with a scenario of how each service is used within a business process.

Server Adapter Services

The Connect:Direct Server adapter supports the following services:

✦ Connect:Direct Server Begin Session Service

✦ Connect:Direct Server BP Response Service

✦ Connect:Direct Server CopyFrom Service

✦ Connect:Direct Server CopyTo Service

✦ Connect:Direct Server End Session Service

✦ Connect:Direct Server Run Job Service

✦ Connect:Direct Server Run Task Service

✦ Connect:Direct Server Submit Service

Connect:Direct Server Begin Session Service

The Begin Session service begins a session with a remote Connect:Direct Node.The service then uses the Connect:Direct Server adapter as the communications mechanism for outbound requests to the remote node.

For example, a Sterling Integrator business process includes a file as primary document to copy to a remote Connect:Direct node. Before the copy operation can begin, a session must be established with the remote Connect:Direct node using the Server Begin Session service.

This service must be configured with the Connect:Direct node name that exists in the netmap of a Connect:Direct Server adapter. You must obtain a valid user ID and password from the remote Connect:Direct node that you want to connect with. You must then specify this user ID and password during configuration of the Begin Session service.

The Begin Session service automatically retries failed session connection attempts. You can specify the maximum number of retries and the time interval between retry attempts using parameters in either the Server adapter or the Begin Session service configuration. When specified in the Begin Session service, the value overrides the values set in the Server adapter configuration and enables a business process to define the Begin Session service retry policy directly.

The remote Connect:Direct node may provide you with a Connect:Direct proxy. The proxy enables you to have a special user ID that maps to a stored user ID and password. If you receive a proxy, use the proxy name in place of the RemoteUserId.

Connect:Direct Server BP Response Service

The BP Response service is used as the last operation in a business process started from a Connect:Direct Server adapter in response to a request from a remote Connect:Direct Server to copy (a file) from a business process. The service performs a callback on the Connect Direct Server adapter that started the business process to convey the primary document used as the response to send to the remote Connect:Direct Server. (This is similar to the HTTP Respond service, which performs a callback on the HTTP Server adapter). This service uses session information placed in the process data by the Connect:Direct Server adapter that started the business process. Therefore the service can only be used in business processes started by a Connect:Direct Server adapter.

A remote Connect:Direct Server initiates a session with a Connect:Direct Server adapter in Sterling Integrator and requests to *copy* (retrieve) the final primary document resulting from a business process started by the Connect:Direct Server adapter. The name of the business process is provided in the request from the remote Connect:Direct node. The last operation in the business process must be the BP Response service, so the service can call back the adapter to respond to the request from the remote Connect:Direct node.

Connect:Direct Server CopyFrom Service

The CopyFrom service copies a file from a remote Connect:Direct node.

To ensure the checkpointed copy performed by this service is restarted if interrupted by a failure of the Sterling Integrator server, the business process must have the recovery level set to **Auto Resume**. If so marked, the business process and the copy resumes automatically when Sterling Integrator restarts, if the

remote Connect:Direct node is still active. When resumed, the copy restarts from the checkpoint. The checkpoint interval must be a value greater than zero. At least three checkpoint intervals must have been passed before the failure or the data transfer restarts at the beginning.

If the CopyFrom service is interrupted by a failure of the remote Connect:Direct node the business process enters a waiting state. When the remote Connect:Direct node is available, run the Schedule_BPExpirator business process in Sterling Integrator to resume the copy. At least three checkpoint intervals must have been passed before the failure or the data transfer restarts at the beginning.

Note: The BPExpirator business process runs automatically every 15 minutes (default). To resume the copy in a shorter time frame, run the Schedule_BPExpirator business process manually.

Connect:Direct Server CopyTo Service

The CopyTo service copies a file to a remote Connect:Direct node. For example, a trading partner copies a business document to a remote Connect:Direct outside the organization.

To ensure the checkpointed copy performed by the CopyTo service is restarted if interrupted by a failure of the Sterling Integrator server, the business process must have the Recovery Level set to **Auto Resume**. If so marked, the business process and copy resumes automatically when Sterling Integrator restarts, if the remote Connect:Direct node is still active.

When resumed, the copy restarts as follows, depending upon the configuration of the Connect:Direct Server adapter:

Document Storage Set To	Restarts From
Database	Beginning
File System or Mailbox	Checkpoint **Note:** The checkpoint interval must be a value greater than zero. At least three checkpoint intervals must have been passed before the failure or the data transfer restarts at the beginning.

Note: Sterling Integrator stores checkpoint information for 30 days, after which it is automatically purged. If your database is corrupted, you must purge this checkpoint information by performing a cold start.

If the CopyTo service is interrupted by a failure of the remote Connect:Direct node the business process enters a waiting state. When the remote Connect:Direct node is available, run Schedule_BPExpirator in Sterling Integrator to resume the copy. At least three checkpoint intervals must have been passed before the failure or the data transfer restarts at the beginning.

Note: The BPExpirator business process runs automatically every 15 minutes (default). To resume the copy in a shorter time frame, run the Schedule_BPExpirator business process manually.

Connect:Direct Server End Session Service

The End Session service ends a session established between two Connect:Direct nodes.Whenever Begin Session service is used in a business process, End Session service must also be used.The service uses the Server adapter as the communication mechanism for the outbound request to end the session.

For example, a Sterling Integrator business process has initiated a session with a remote Connect:Direct node using the Begin Session service. During the course of the session, some business activity occurs, for example a file is copied from the remote Connect:Direct node. After the operation is complete, the business process uses the End Session service to terminate the session.

Connect:Direct Server Run Job Service

The Run Job service submits work to the remote Connect:Direct node that executes asynchronously (relative to the remaining steps in the business process). Do not use the Run Job service to submit to a Connect:Direct Server adapter in Sterling Integrator.

For example, write a business process that uses the Run Job service to execute a script on a remote Connect:Direct node. You can use this service to execute a script that compresses and archives log files asynchronously on a remote Connect:Direct node.

Connect:Direct Server Run Task Service

The Run Task service submits work to the remote Connect:Direct node that executes synchronously relative to the remaining steps in the business process. Do not use the Run Task service to submit to a Connect:Direct Server adapter in Sterling Integrator.

For example, write a business process that uses the Run Task service to execute a script on a remote Connect:Direct node. You can use this service to execute a script that compresses and archives log files synchronously on a remote Connect:Direct node.

Connect:Direct Server Submit Service

The Submit service submits a Connect:Direct Process to another Connect:Direct node. The Process submitted must be saved in a file on the Connect:Direct node where the Submit Process statement executes.

Note: Connect:Direct Server adapter supports the Submit Process statement. It does not support the Submit Process command in Connect:Direct.

Use this service to initiate work on a remote Connect:Direct node. During execution of a Connect:Direct Process, the submit statement causes a different Connect:Direct Process to be submitted to either the PNODE or the SNODE. The sysopts parameters specified in the Submit Process statement are passed to the business process. Any values specified through the Submit service override values in the process file.

Submit Process Name can also be formatted for submitting to a Sterling Integrator Connect:Direct Server adapter. Use a process name such as the following:

/businessprocess/serverbpname/somedocname

For example, a file on a remote Connect:Direct node is needed on another node. Create a business process to submit a Connect:Direct Process to the remote Connect:Direct node to transfer the file.

Requester Adapter Services

The Requester adapter provides the following services:

✦ Connect:Direct Requester Select Process Service
✦ Connect:Direct Requester Select Statistics Service

✦   Connect:Direct Requester Submit Service

Connect:Direct Requester Select Process Service

The Select Process service retrieves information about a Process that is in progress on a remote Connect:Direct Server. Information can be retrieved based on query criteria such as Process name and number, SNODE, queue, status, or submitter node and user ID.

Use Select Process to get status information about a Process submitted to a remote Connect:Direct node. This service uses the Requester adapter as the communication mechanism for the request. For example, a business process submits a Connect:Direct Process to a remote Connect:Direct node, then uses the Select Process service to check the status of the Process.

Connect:Direct Requester Select Statistics Service

The Select Statistics service retrieves statistics from a remote Connect:Direct node based on various criteria, such as Process name, start and stop date, start and stop time, and so on. This service examines records in the Statistics Log for a remote Connect:Direct node.

Use Select Statistics to get status information about a Process submitted to a remote Connect:Direct node. This service uses the Requester adapter as the communication mechanism for the request. For example, a business process submits a Connect:Direct Process to a remote Connect:Direct node, then uses the Select Statistics service to check the completion status of the Process.

Connect:Direct Requester Submit Service

The Submit service submits a Connect:Direct Process to a remote Connect:Direct node.

Use the Submit service to initiate work on a remote Connect:Direct node. The service uses the Requester adapter as the communication mechanism for the request.

For example, a file on a remote Connect:Direct node is needed on another node. Create a business process to submit a Connect:Direct Process to the remote Connect:Direct Server to transfer the file from one node to the other.

Sample Business Process Scenario for Connect:Direct Interoperability

This business process scenario consists of two fictitious companies, MaxxMart and Contempo Bank, in which Contempo Bank, an online bank, provides loans for high-ticket items (such as high-end electronics) to customers of MaxxMart, a large retailer.

As part of the agreement, MaxxMart has setup several PCs in its store with a web-based interface through which customers can complete online applications for financing MaxxMart's high-ticket items. The agreement between MaxxMart and Contempo requires quick approval with no more than a 30-minute turnaround on loan applications.

Contempo, who has the role of main trading partner, has Connect:Direct installed. MaxxMart, who has the role of external trading partner, has Sterling Integrator installed and uses the Connect:Direct Server adapter and Web Extensions.

MaxxMart has configured an instance of the Connect:Direct Server adapter with a node defined for Contempo. MaxxMart uses a customized Web Extensions interface for the online application. Contempo has added an entry for the MaxxMart Connect:Direct Server adapter node to its network map.

When MaxxMart receives the loan request, it forwards the application to Contempo, where a back end system either approves or denies the request. Contempo returns the approval (or denial) to MaxxMart. For approved loans, MaxxMart also initiates a Connect:Direct Process that causes Contempo to transfer funds for the approved loan to the MaxxMart bank account as an ACH transaction. The MaxxMart bank requires that ACH transactions be handled through AS2.

The CDInterop_AppProcess business process, Connect:Direct Server adapter, HTTP Server adapter, and the following services are used in this scenario:

✦ Connect:Direct Server Begin Session service

✦ Connect:Direct Server CopyTo service

✦ Connect:Direct Server Run Task service

✦ SMTP Send adapter

✦ Connect:Direct Server Submit service

✦ EDIINT Message service

✦ Connect:Direct Server End Session service

The following steps outline the business process scenario being addressed by Sterling Integrator and Connect:Direct Interoperability:

1. A MaxxMart customer completes an online loan application using the Web Extensions custom interface and submits the application.

2. The MaxxMart Sterling Integrator system initiates the CDInterop_AppProcess business process, which establishes a connection with the Contempo Connect:Direct server using the Connect:Direct Server Begin Session service. The Begin Session service is configured to use a specific Connect:Direct Server adapter for the connection.

3. The Connect:Direct Server adapter specified in the Begin Session service retrieves node information for the Contempo node from its configuration.

4. The adapter then passes its identification information to the Contempo node through a perimeter server in the DMZ, and the Contempo node returns its identification information to MaxxMart's node.

5. The MaxxMart node sends a user ID and password to the Contempo node, and the Contempo node verifies the user ID and password. After this verification, the Contempo node authorizes the session.

6. At this point, the MaxxMart node copies the customer loan application to a specified location at Contempo using the Connect:Direct Server CopyTo service. This loan application is included as the primary document in the CDInterop_AppProcess business process, which initiated when the customer submitted the application. The location where the loan application is copied is the starting point for all loan applications at Contempo. A process already exists in the Contempo business environment that takes loan applications from this location and processes them using a back-office system.

7. The next activity in the business process uses the Connect:Direct Server Run Task service and executes the back-office system at Contempo that processes (approves/denies) loan applications. The business process waits for a synchronous response from the back-office system as a result of the Run Task activity.

8. The Contempo back-office system processes the loan application using the copied file and approves the loan. The back office system returns an approval response to the CDInterop_AppProcess business process, specifying the name and location of the approval document.

9. The approval response is forwarded to a MaxxMart e-mail address using the SMTP Send adapter and a MaxxMart associate receives the approval notification.

10. After receiving the approval response, the CDInterop_AppProcess uses the Connect:Direct Server Submit service to start a Connect:Direct Process that exists on the Contempo node. The Connect:Direct Process causes an ACH transfer to deposit the loan funds into MaxxMart's account.

11. The Connect:Direct Process is initiated and the ACH file is generated through an internal ACH application at Contempo. The generated ACH file is then transferred (copied) to the CDInterop_AppProcess business process.

12. When the business process receives the ACH file, it uses the EDIINT Message service to transform the file into an EDIINT message, which it then transfers to MaxxMart's bank account through the HTTP Server adapter.

13. The business process receives the synchronous MDN response from the bank acknowledging receipt of the ACH transfer.

14. The final activity in the CDInterop_AppProcess ends the session with Contempo node using the Connect:Direct Server End Session service. The End Session service uses the session token available in the business process data and closes the connection with the Contempo node.

15. If the business process fails, the failure is recorded at the close of the session.

In the Graphical Process Modeler, the business process is displayed as in the following figure:

The BPML associated with this business process is as follows.

Note that the value for the Program parameter in the CD Server Run Task Service operation section is specific to CD Windows.

```
<process name="default">
  <sequence>
    <operation name="CD Server Begin Session Service">
```

```
    <participant name="CDServerBeginSession"/>
    <output message="CDServerBeginSessionServiceTypeInputMessage">
      <assign to="LocalCDNodeName">CDSA1</assign>
      <assign to="RemoteCDNodeName">UNIXCD1</assign>
      <assign to="RemotePasswd">abcdefg</assign>
      <assign to="RemoteUserId">auser</assign>
      <assign to="." from="*"></assign>
    </output>
    <input message="inmsg">
      <assign to="." from="*"></assign>
    </input>
</operation>

<operation name="CD Server CopyTo Service">
    <participant name="CDServerCopyTo"/>
    <output message="CDServerCopyToServiceTypeInputMessage">
      <assign to="LocalDocumentId">loanapp</assign>
      <assign to="RemoteFileName">approval</assign>
      <assign to="SessionToken">token</assign>
      <assign to="." from="*"></assign>
    </output>
    <input message="inmsg">
      <assign to="." from="*"></assign>
    </input>
</operation>

<operation name="CD Server Run Task Service">
    <participant name="CDServerRunTask"/>
    <output message="CDServerRunTaskServiceTypeInputMessage">
       <assign to="Program">pgm(\Progra~1\JavaSoft\JRE\bin\java)</assign>
       <assign to="SystemOpts">args(-cp c:\tmp RunTask arg1 arg2)</assign>
      <assign to="SessionToken">token2</assign>
      <assign to="." from="*"></assign>
    </output>
    <input message="inmsg">
      <assign to="." from="*"></assign>
    </input>
</operation>

<operation name="SMTP Send Adapter">
    <participant name="SMTP_SEND_ADAPTER"/>
    <output message="SMTP_SEND_ADAPTERInputMessage">
      <assign to="." from="*"></assign>
    </output>
    <input message="inmsg">
      <assign to="." from="*"></assign>
    </input>
</operation>

<operation name="CD Server Submit Service">
    <participant name="CDServerSubmit"/>
    <output message="CDServerSubmitServiceTypeInputMessage">
      <assign to="RemoteProcessFile">denial</assign>
      <assign to="SessionToken">token3</assign>
      <assign to="." from="*"></assign>
    </output>
```

```
    <input message="inmsg">
      <assign to="." from="*"></assign>
    </input>
  </operation>

  <operation name="EDIINT Message Service">
    <participant name="TestEDIINTParse"/>
    <output message="EDIINTMessageServiceInputMessage">
      <assign to="." from="*"></assign>
    </output>
    <input message="inmsg">
      <assign to="." from="*"></assign>
    </input>
  </operation>

  <operation name="CD Server End Session Service">
    <participant name="CDServerEndSession"/>
    <output message="CDServerEndSessionServiceTypeInputMessage">
      <assign to="SessionToken">token4</assign>
      <assign to="." from="*"></assign>
    </output>
    <input message="inmsg">
      <assign to="OnFaultHandler" from="*"></assign>
    </input>
  </operation>

  <onFault>
    <sequence name="OnFault">
      <operation name="CONNECT:Direct Server BP Response Service">
        <participant name="CDServerTestBPResponse1"/>
        <output message="BPResponseParams">
          <assign to="." from="*"></assign>
        </output>
        <input message="inmsg">
          <assign to="BPResponseResults" from="*"></assign>
        </input>
      </operation>

      <operation name="Connect:Direct Server End Session Service">
        <participant name="CDServerEndSession"/>
        <output message="EndSession">
          <assign to="." from="*"></assign>
          <assign to="SessionToken"
from="//BeginSessionResults/SessionToken/node()"></assign>
        </output>
        <input message="inmsg">
          <assign to="EndSessionResults" from="*"></assign>
        </input>
      </operation>

    </sequence>
  </onFault>
 </sequence>
</process>
```

Configuring Sterling Integrator and Connect:Direct for Interoperability

To exchange data between Sterling Integrator and Connect:Direct, you must complete configuration tasks in both the Connect:Direct and Sterling Integrator applications.

This section covers the following topics:

✦ Configuring Connect:Direct for Interoperability with Sterling Integrator

✦ Configuring Sterling Integrator for Connect:Direct Interoperability

✦ Security Considerations for Connect:Direct Interoperability

Configuring Connect:Direct for Interoperability with Sterling Integrator

To transfer data and submit business processes to a remote Sterling Integrator node, you must add information about the node to the network map on the Connect:Direct server that initiates the communication session.

The network map includes the names of all the remote nodes that the Connect:Direct local node can communicate with, the paths to contact those remote nodes, and characteristics of the sessions for communication.

You must obtain certain information ahead of time from the Sterling Integrator administrator to configure the netmap entry for the Sterling Integrator remote node. See *Configuring a Netmap Entry* for additional information.

You must configure the Connect:Direct browser hyperlink properties file to use the Connect:Direct browser to monitor activity and perform queries for Sterling Integrator processes initiated by a Connect:Direct node. To monitor activity and perform queries on Sterling Integrator processes initiated by a Connect:Direct node, you must configure the Connect:Direct browser properties file to display a hyperlink to Sterling Integrator.

Configuring a Netmap Entry

You can configure a netmap entry in Sterling integration from the Administration menu by selecting **Deployment > Adapter utilities > C:D Netmaps**.

From this menu, you can configure:

✦ C:D Nodes

✦ C:D Netmaps

✦ C:D Netmap cross-references (X-REF)

C:D Nodes

From the C:D Netmaps menu, select C:D Nodes. The C:D Nodes page appears. From this page you can:

✦ Create a new node

✦ Search existing nodes, by name

✦ List existing nodes in either an alphabetical or by a specific C:D Netmap

To create a new node, in Create, click **Go!**. The Create Node page appears.

Field	Description
Connect:Direct Server Node Name	Name that will be used to identify this Connect:Direct Server adapter. Type the node name for the Connect:Direct server. Required.
Connect:Direct Server Host	Type the host name for the Connect:Direct server. Required.
Connect:Direct Port	TCP/IP port number that Connect:Direct monitors for requests from remote nodes. Type the port for the Connect:Direct server. Required.
Max locally initiated (pnode) sessions allowed	Maximum number of sessions the Connect:Direct Server adapter may have active at any point of time. Required. May be overridden at the node level. If a node-level value is configured, the effective session limit is the smaller of two values: the limit for the adapter and the session limit for the remote node. Valid value: Any number up to 9999. Minimum value is 1. Default is 5.
Max remotely initiated (snode) sessions allowed	Maximum number of sessions from remote nodes that may be active at any point of time. Required. May be overridden at the node level. If a node-level value is configured, the effective session limit is the smaller of two values: the limit for the adapter and the session limit for the remote node. Valid value: Any number up to 9999. Minimum value is 1. Default is 5.
Secure+ Option	Valid if Netmap Override=Yes at the CDSA. Indicate if you want to disable or enable security. Required. Valid values are: ◆ Disabled (default) ◆ Enabled

Options if Secure+ is Enabled

The following fields are available only if the Secure+ option is enabled.

CA Certificates	Drop-down menu that contains a list of trusted Certificate Authority public certificates. Valid values are all CA certificates in this installation of your application. Required.
System Certificate	List of private keys and public certificates signed by the trading partner trusted certificate authority. This represents the certificate for the local node (this adapter). Valid values are all system certificates in this installation of your application.
Certificate Common Name	Value to be compared with the Common Name (CN) field from the remote node's certificate during TLS/SSL handshake in order to enhance certificate authentication. May be overridden at the node level. **Note:** To see the actual CNs being compared during the handshake, set the Perimeter Services logging level to ALL.
Cipher Suites	Indicates cipher suites available to support varying encryption levels. Multiple selections allowed. Selections can be rank ordered. Valid values are all available cipher suites in this installation of your application.
SSL or TLS	Indicates the cryptographic protocol used. Valid values are: SSL– Secure Socket Layer (default) TLS – Transport Socket Layer
Require Client Authentication:	Indicates whether the remote node requires clients to authenticate. Required. Valid values are: Yes No

C:D Netmaps

When you have entered the C:D Nodes you want to use, you can create a netmap. From the C:D Netmaps menu, select C:D Netmaps. The C:D Netmaps page appears. From this page you can:

✦ Create a new netmap

✦ Search existing netmaps, by name

✦ List existing netmaps in an alphabetical list

To create a new netmap, in Create, click **Go!**. The Create Netmap page appears.

Field	Description
Netmap Name	Type the C:D netmap name. Required.
Netmap Description	Type the netmap description. Required.

C:D Netmap Cross-Reference

You can reuse nodes for a netmap or several netmaps by setting up a cross reference so you don't have to create a new node for each adapter.

To create or modify a C:D Netmap Cross-Reference, from the C:D Netmaps menu, select C:D Netmap X-REF. The C:D Netmaps Cross Reference page appears. From this page you can:

✦ Create or modify a new netmap cross-reference

✦ Search existing netmap cross-references, by name

✦ List existing netmaps cross-references in an alphabetical list

To create a new netmap cross-reference, in Create, click **Go!**. The Create Netmap page appears.

Field	Description
C:D Netmap Name	Select the C:D Netmap name. Required.

The next screen shows a list of nodes related to this netmap. You cannot modify any of the components of the relationship. Allowed operations are:

✦ Add cross-references

✦ Delete cross-references

Field	Description
Add Node	Click the plus sign to add a Node Name to the cross-reference. A new window appears, allowing you to select the C:D Node Name(s)
Delete	Delete the cross-reference.

To delete a netmap cross-reference:

1. Search or list for the netmap cross-reference you want to delete and select it.

2. Click delete.

Note: You are not deleting nodes or netmaps but rather the relationship between them (the cross-reference).

Converting Nodes to a Netmap

It is recommended that you convert your existing nodes to a netmap for each adapter. When a certificate expires for a node that is used by many adapters, you will only have to update it once, instead of having to update all the adapters you use on that node.

To convert nodes to a netmap:

1. From the Administration menu, select Deployment > Services > Configuration.

2. Search or list the Connect:Direct Server Adapter and select it. The Services Configuration page appears.

3. Select the edit link for the adapter you want to convert.

4. Click **Next** to go to the Netmap page or click the **Netmap** link (just after the **Encryption** link) on the side links.
   The Netmap page appears with the current configured nodes for the adapter.

5. Click **Next** to go to the Convert Nodes pages.

6. Select the checkbox for **Convert current Connect:Direct Server Nodes to a Netmap** and click **Next t**o confirm**.**

7. Click **Finish** to save a new version of the adapter with the nodes converted to a netmap. The netmap name matches the C:D server adapter name by default. It cannot be changed.

When displaying adapter details, two new entries will appear right before the node information:

✦ Connect:Direct Server Netmap – Adapter name

✦ Number of Nodes in Netmap – Number of nodes in netmap

Switching Netmaps

You can update your adapter to switch netmaps. To switch a netmap:

1. From the Administration menu, select **Deployment > Services > Configuration**.

2. Search or list the Connect:Direct Server Adapter and select it. The Services Configuration page appears.

3. Select the edit link for the adapter you want to edit.

4. Click **Next** to go to the Netmap page or click the **Netmap** link (just after the **Encryption** link) on the side links. The Netmap page appears.

5. In the C:D Netmap Name list, select the netmap you want to use.

6. Click **Next** to the Confirm page and then click **Finish**.

Adding a Remote Sterling Integrator Node to a Network Map

Several tools are available to add a node to a Connect:Direct network map based on the appropriate Connect:Direct node platform you use (UNIX, Windows, OS/390, OS/400).

To learn how to add nodes to network maps, see the Connect:Direct documentation available online from the Sterling Commerce Documentation Library.

You must obtain the following information before you can add a remote Sterling Integrator node to a Connect:Direct network map:

Parameter	Description
Node Name	Specifies the 1–16 character node name parameter that defines the name of the remote node. Required. Sterling Integrator must provide the node name.
	Note: The node name does not have to be previously defined in Sterling Integrator because the Connect:Direct network map does not perform an immediate check. Ensure the node name is the same node name used when you set up the Sterling Integrator adapter.

Parameter	Description
Port	Specifies the Connect:Direct communications port portion of the comm.info parameter. The format is a port name or *nnnnn,* where *nnnnn* is a 1–5 digit number. The default is 1364. Sterling Integrator must provide the port value. Required.
IP Address	The value is one of the following: ◆ The host name of the Connect:Direct host computer. ◆ The IP address of the remote node in *nnn.nnn.nnn.nnn* format. Required.
Buffer Size	Specifies the comm.bufsize parameter, which is the buffer size for transmitting data to and from a remote node. The value for TCP/IP is unlimited. The default is 4096 bytes. **Note:** The Sterling Integrator adapter deploys with a default buffer size. The two nodes negotiate buffer size and the lower size is selected. For a larger buffer size from the start, negotiate with the administrator for the remote node before configuring.

Obtaining User Authorization

To perform certain tasks on a remote Sterling Integrator node (such as access a mailbox or initiate business processes), you must obtain a valid Sterling Integrator user name and password, and include them when you write your Process statements. Get this information when you contact the Sterling Integrator administrator to obtain network map parameters.

Configuring Connect:Direct Browser Hyperlink Properties

The Connect:Direct Browser User Interface enables you to monitor activity and perform queries for Sterling Integrator business processes initiated by a Connect:Direct node from an Internet browser. The Select Process or Select Statistics commands are hyperlinked to Sterling Integrator search pages where you can retrieve detailed information about Sterling Integrator business processes associated with a Connect:Direct Process, assuming you have the valid security privileges.

Note: To use the hyperlink capability, do not specify a value for ProcessName in the Connect:Direct Server Begin Session service. The hyperlink is active only with the system-generated ProcessName.

To use the hyperlink capability, you must configure two Link Properties in the Connect:Direct Browser User Interface.

To configure a hyperlink properties file in the Connect:Direct Browser User Interface:

1. On the User Function page, click **Admin Functions**.
2. Click **Configuration**.
3. Type the administrator ID and password and click **Sign On**.
4. The Configure Node Properties page is displayed. Click **Administrator Links**.

5. The Configure Link Properties page is displayed. Type the parameter values for the first Link Property and click **Add**. The following table describes the parameters to configure the Link Properties:

Parameter	Description
LInk Name	Link1
Node Name	Sterling Integrator Connect:Direct Node Name
Record IDs	Leave the default record IDs
Advanced	Leave this field blank
URL	`http://<host:port>/ws/ExtLogin?userid=&USERID;&password=&PASSWORD;&bpid=&BPID;` **Note:** Type this URL exactly as is, except replace *<host:port>* with the host and port for your Sterling Integrator browser interface.
User ID	Sterling Integrator user ID
Password	Sterling Integrator password

This links to the Business Process Details page for the Sterling Integrator business process.

6. Type the parameter values for the second Link Property and click **Add**.

The following table describes the parameters to configure the Link Properties:

Parameter	Description
Link Name	Link2
Node Name	Sterling Integrator Connect:Direct Node Name
Record IDs	Leave the default record IDs
Advanced	Leave this field blank
URL	`<http://<host:port>/ws/ExtCorr?userid=&USERID;&password=&PASSWORD;&where=live&CD ProcessName=&PNAM;&CD ProcessNum=&PNUM;&CD SnodeName=&SNOD;&CD PnodeName=&PNOD;&CD LocalFileName=&SFIL;&CD RemoteFileName=&DFIL>;` **Note:** Type this URL exactly as is, except replace *<host:port>* with the host and port for your Sterling Integrator browser interface.
User ID	Sterling Integrator user ID
Password	Sterling Integrator password

This links to the Correlation Search Results page and enables you to select the appropriate Sterling Integrator business process.

Note: Because the process records are hyperlinked with the first matching link, the links for Sterling Integrator must be named alphabetically so that the first link matches first. For example, if the first link is named Link1, the second link could be named Link2.

Configuring Sterling Integrator for Connect:Direct Interoperability

The Connect:Direct Server adapter and Connect:Direct Requester adapter in Sterling Integrator establish connectivity to Connect:Direct.

This section describes what information you must have to configure the Connect:Direct Server adapter and Connect:Direct Requester adapter and provides instructions on how to configure them.

Configuring the Connect:Direct Server Adapter

The Connect:Direct Server adapter sends, receives, and processes requests from remote Connect:Direct nodes. Use this adapter to initiate business processes that perform some work (for example, copy files to or from Sterling Integrator or to or from a Sterling Integrator mailbox).

Each configuration of the Connect:Direct Server adapter corresponds to a complete installation of a Connect:Direct server. For example, if you deploy five configurations of the Connect:Direct Server adapter, you have deployed five Connect:Direct servers because other Connect:Direct nodes recognize each adapter as a separate Connect:Direct server.

The following information is needed before you can create and enable a configuration of the Connect:Direct Server adapter:

Remote Server Information	Description
Connect:Direct Port	TCP/IP port number that the Connect:Direct Server adapter monitors for requests from remote nodes. Required.
Connect:Direct Node Name	Name that identifies this Connect:Direct Server adapter. This is the name you give to the remote Connect: Direct node to create a netmap entry for the Connect:Direct Server adapter. Maximum 16 characters. Required.

Configure the Connect:Direct Server adapter using the adapter documentation.

Configure services and create business processes that use the services to send, receive, and process requests from remote Connect:Direct nodes that include your Server adapter in their network map.

Note: The new instance of the Connect:Direct Server adapter must be enabled to communicate with Connect:Direct.

Configuring the Connect:Direct Requester Adapter

Use the Connect:Direct Requester adapter to act as a Connect:Direct client and perform queries on work that is in progress or has completed on a Connect:Direct node. You can also use the Requester adapter to submit a Process that initiates a sequence of steps on a remote Connect:Direct server. In other words, you can request that a Process run on another server.

Caution: Because of our continuing efforts to improve services and adapters to align with new technology and capabilities, the Connect:Direct adapter has entered the retirement process in Sterling Integrator and is replaced with the Connect:Direct Requester adapter with related services.

Prerequisites

The following information is needed before you can create and enable a configuration of the Connect:Direct Requester adapter:

Remote Server Information	Description
Remote Connect:Direct Server Address	Host name or IP address of the remote Connect:Direct server to connect to.
Remote Connect:Direct Server Port	Port number that the remote Connect:Direct server is monitoring for API connections.
Connect:Direct User ID	User ID required to access the Connect:Direct server.
Connect:Direct Password	Password required to access the Connect:Direct server.

Create a configuration of the Connect:Direct Requester adapter using the adapter documentation.

Configure services and create business processes that use the services to send, receive, and process requests from remote Connect:Direct nodes that include your Requester adapter in their network map.

Note: The new instance of the Connect:Direct Requester adapter must be enabled to communicate with Connect:Direct.

Security Considerations for Connect:Direct Interoperability

Connect:Direct and Sterling Integrator work together to provide a secure method of exchanging data through a combination of the Connect:Direct Secure+ Option combined with Sterling Integrator perimeter services.

Connect:Direct Secure+ Option

Connect:Direct Secure+ Option with Sterling Integrator enables you to select either Transport Layer Security (TLS) or Secure Sockets Layer protocol (SSL) security protocols to use to secure data during electronic transmission.

The TLS and SSL protocols provide three types of security:

✦ Server Authentication, in which the PNODE requests a certificate from the SNODE during the initial communication. The SNODE returns its certificate information and the PNODE then compares the

certificate information to a list of trusted sources. If the certificate is signed by a trusted source, a connection is established.

✦ Client authentication, which requires the PNODE to send its own certificate. If enabled, the SNODE requests certificate information from the PNODE, after it returns its certificate information to the PNODE. If the client certificate is signed by a trusted source, the connection is established.

✦ Client authentication with common name checking, which requires a certificate common name in the PNODE certificate. The SNODE searches the certificate file it receives from the PNODE and looks for a certificate common name. If the SNODE finds the certificate common name, communication is established.

Note: Sterling Integrator does not support Station-to-Station protocol (STS) security.

The Connect:Direct Server adapter uses the TLS and SSL protocol certificates to exchange a session key between the PNODE and SNODE.

The Connect:Direct server certificates and cipher suites are listed in the configuration of the Connect:Direct Requester adapter for authentication by the Connect:Direct server. The Requester adapter does not have a certificate or private key. The TLS and SSL protocols use certificates to exchange a session key between the Connect:Direct Requester adapter and the Connect:Direct server.

Node Communication for Connect:Direct Interoperability

This section is in the context of a Connect:Direct PNODE in communication with a Sterling Integrator Connect:Direct Server adapter functioning as the SNODE.

Connect:Direct uses Processes to perform tasks on other Connect:Direct nodes, including a Sterling Integrator Server adapter operating as a Connect:Direct node. Processes are constructed and submitted for execution in several ways, depending on the user interfaces available on your operating environment.

A Connect:Direct Process is composed of a required process statement, followed by one or more additional statements, such as copy or submit.

This section covers the following topics:

✦ Process Statements for Connect:Direct Interoperability

✦ Copy Statements

✦ Submit Statements

✦ Authentication Issues Requiring Process Updates

✦ Forwarding of Run Job and Run Task in Connect:Direct Interoperability

✦ Sample Business Process For Run Job Forwarding in Connect:Direct Interoperability

✦ Sample Connect:Direct Script for Connect:Direct Interoperability

✦ Sample Process with Session Token for Connect:Direct Interoperability

Process Statements for Connect:Direct Interoperability

The Connect:Direct Process statement defines the beginning of a series of one or more statements that specify functions to be performed. Every Connect:Direct Process contains a process statement. The process statement defines the attributes of the Process, including:

✦ Name of the secondary node (SNODE) involved in the Process

✦ Process execution priority

✦ When to start the Process if not immediately (Scheduling)

✦ Whom to notify upon completion of each step

✦ Whether to store a copy of the Process to execute at future specified intervals (Set Retain = Yes)

The following table lists process statements and their functions:

Process Statement	Function
process	Defines general Process characteristics.
copy	Copies files from one node to another.
run task	Enables you to specify commands in a Process. The Process waits for the task to finish before executing the next step in the Process.
run job	Enables you to specify commands in a Process. The Process does not wait for the job to finish to execute the next step in the Process.
submit	Starts another process to either the local or remote node during execution of a Process.
conditional	Alters the sequence of Process execution based on the completion code of previous steps with the if, then, else, eif (end if), goto, and exit statements.
pend	Marks the end of a Connect:Direct Process.

To start a business process on Sterling Integrator from a remote Connect:Direct:

1. In Sterling Integrator, create a permission for the business process.

2. In Sterling Integrator, assign the SNODE userid access to the business process.

3. From Connect:Direct, send a request to Sterling Integrator. Requests could include:

   ◆ Copy To business process

   ◆ Copy From business process

   ◆ Submit to Sterling Integrator

Note: Sterling Integrator does not accept run task and run job process statements from a Connect:Direct node, except for forwarding the task or process to a Connect:Direct node (not a Sterling Integrator Server adapter).

Copy Statements

Copy statements must have a Sterling Integrator Mailbox or business process as the destination or source file. Specific syntax is required in the copy statement.

The copy statement is composed of a from clause that includes the source file name and a to clause that includes the destination file name. Additional parameters can be specified to further customize the file transfer operation.

Following is an example of a Process for Connect:Direct Windows that includes a copy statement for a file named C:\files\bigfile10m and a Sterling Integrator Mailbox named test1:

```
/*BEGIN_REQUESTER_COMMENTS
    $PNODE$="ROGER-VM-2K" $PNODE_OS$="Windows"
    $SNODE$="vcdps3" $SNODE_OS$="UNIX"
```

```
    $OPTIONS$="WDOS"
    END_REQUESTER_COMMENTS*/
SAMPLE PROCESS
    SNODE=vcdps3
        SNODEID=(lucita, lucitazPwd)
STEP1 COPY
    FROM (
    FILE=C:\files\bigfile10m
    SYSOPTS="DATATYPE(BINARY) XLATE(NO) "
    TO (
    FILE=/mailbox/test1/copiedDoc_10m
    SYSOPTS=":datatype=binary::xlate=no:"
    CKPT=No
PEND
```

The destination document is named copiedDoc_10m.

Syntax for Copy Statements when Sterling Integrator is SNODE

To retrieve a document (copyfrom) from Sterling Integrator or to send a document to (copyto) Sterling Integrator, you must use the valid syntax with the copy statement. File names and mailbox names are case-independent.

✦ Use this to send a file to or from a business process with a copy statement:

>   /businessprocess/*yourbpname*/*nameofdoc*

✦ Use this to get a document directly to or from a Sterling Integrator mailbox with a copy statement:

>   /mailbox/*yourmailboxname*/*yourmessagename*

Caution: Some Connect:Direct installations do not accept empty records. To avoid a rejection of the copy request, a blank space is added to replace an empty line.

Submit Statements

During execution of a Connect:Direct Process, the submit statement triggers another Connect:Direct Process to be submitted to either the PNODE, which is the node with Process control, or the SNODE, which is the secondary node that participates in the Process.

Syntax for Submit Statements when Sterling Integrator is SNODE

To submit a business process, you must use the valid syntax with the submit statement. Submitted processes must be business processes.

Use this to send a business process with a Submit statement:

>   /businessprocess/*yourbpname*

Authentication Issues Requiring Process Updates

For OS/390, you must add SNODEID=(NODENAME, NODENAME) to the Connect:Direct Process because OS/390 does not require a user name and password for authentication. OS/390 authenticates with peers using user name, node, and IP address. Sterling Integrator requires a user name and password.

Forwarding of Run Job and Run Task in Connect:Direct Interoperability

Sterling Integrator can serve as a proxy between any Connect:Direct node and a Connect:Direct OS/390 nodes. You would do this when you want to move data between nodes with the security features of Sterling Integrator Perimeter Services.

In this scenario, the following steps occur:

1. Sterling Integrator Connect:Direct Server adapter receives a request from a Connect:Direct PNODE to initiate a run job or run task on a Connect:Direct SNODE.

2. The Connect:Direct Server adapter verifies that the user may perform this action.

3. The PNODE provides information about the run job or run task to the Connect:Direct Server adapter.

4. The Connect:Direct Server adapter initiates a business process with access control (permission assigned) for the user specified by the SNODE.

   The Connect:Direct Server adapter must be configured with the business process specified in the Run Task Business Process Name or Run Job Business Process Name field.

5. The business process forwards the run job or run task request through the Connect:Direct Server adapter to a Connect:Direct SNODE.

6. The Connect:Direct Server adapter provides status information to the business process that initiated the run job or run task.

7. The Connect:Direct Server adapter provides status information to the PNODE.

Sterling Integrator is capable of forwarding run job and run task to Connect:Direct OS/390 nodes only.

Sample Business Process For Run Job Forwarding in Connect:Direct Interoperability

A sample business process to do Run Job Forwarding follows:

```
<process name="RunJobServiceExample">
  <sequence name=>
      <operation name="CONNECT:Direct Server Begin Session Service">
        <participant name="CDServerBeginSession"/>
        <output message="BeginSession">
          <assign to="." from="*"></assign>
          <assign to="LocalCDNodeName">CDSERVER_ADAPTER_TEST1</assign>
```

```
              <assign to="RemoteCDNodeName">CDUNIX_NODE1</assign>
              <assign to="RemoteUserId">SNUSERID</assign>
              <assign to="RemotePasswd">SNPASSWORD</assign>
            </output>
            <input message="inmsg">
              <assign to="BeginSessionResults" from="*"></assign>
            </input>
         </operation>
         <operation name="CONNECT:Direct Server Run Job Service">
            <participant name="CDServerRunJob"/>
            <output message="RunJob">
              <assign to="." from="*"></assign>
              <assign to="SessionToken" from =
"//BeginSessionResults/SessionToken/text()"></assign>
              <assign to="Sysopts" from =
"CDServerNodeData/Forwarding/ProcessInfo/text()"></assign>
            </output>
            <input message="inmsg">
              <assign to="RunJob_Results" from="*"></assign>
            </input>
         </operation>
         <operation name="CONNECT:Direct Server End Session Service">
            <participant name="CDServerEndSession"/>
            <output message="EndSession">
              <assign to="." from="*"></assign>
              <assign to="SessionToken"
from="//BeginSessionResults/SessionToken/text()"></assign>
            </output>
            <input message="inmsg">
              <assign to="EndSessionResults" from="*"></assign>
            </input>
         </operation>
     </sequence>
</process>
```

Sample Business Process for Run Task Forwarding in Connect:Direct Interoperability

This is a sample business process to do Run Task Forwarding:

```
<process name="RunTaskServiceExample">
  < sequence name="CDServerRunTask">
        <operation name="CONNECT:Direct Server Begin Session Service">
           <participant name="CDServerBeginSession"/>
           <output message="BeginSession">
             <assign to="." from="*"></assign>
             <assign to="LocalCDNodeName">CDSERVER_ADAPTER_TEST1</assign>
             <assign to="RemoteCDNodeName">CDUNIX_NODE1</assign>
             <assign to="RemoteUserId">testUser</assign>
             <assign to="RemotePasswd">whatisthis</assign>
           </output>
           <input message="inmsg">
```

```
            <assign to="BeginSessionResults" from="*"></assign>
          </input>
        </operation>
        <operation name="CONNECT:Direct Server Run Task Service">
          <participant name="CDServerRunTask"/>
          <output message="RunTask">
            <assign to="." from="*"></assign>
    <assign to="SessionToken"
                from="//BeginSessionResults/SessionToken/text()"></assign>
   <assign to="Program" from=
   "  CDServerNodeData/Forwarding/ProcessInfo/text()"></assign>
   <assign to="Sysopts" from =
   "CDServerNodeData/Forwarding/Sysopts/text()"></assign>
   </output>
          <input message="inmsg">
            <assign to="RunTask_Results" from="*"></assign>
          </input>
        </operation>
        <operation name="CONNECT:Direct Server End Session Service">
          <participant name="CDServerEndSession"/>
          <output message="EndSession">
            <assign to="." from="*"></assign>
            <assign to="SessionToken"
from="//BeginSessionResults/SessionToken/text()"></assign>
          </output>
          <input message="inmsg">
            <assign to="EndSessionResults" from="*"></assign>
          </input>
        </operation>
  </sequence>
```

Sample Connect:Direct Script for Connect:Direct Interoperability

The following sample Process uses Connect:Direct OS/390 Process statements to illustrate product functionality:

```
/*
COPY01 PROCESS -- copies PDS members beginning with INV*
to the Chicago node
if successful, runs USERJOB on the
Chicago node to modify data
copies modified FILEA back from Chicago
if not successful, sends NOTIFY to inform about
STEP01 failure
Modification History:
04.Jul.1998 CSG Initial Implementation
*/
COPY01 PROCESS SNODE=CD.CHICAGO
STEP01 COPY FROM (DSN=MASTER.PDS - /* send PDS member INVxxxx */
SELECT=INV*) - /* to Chicago and place in */
TO (DSN=MUNGE.ME) /* file "MUNGE.ME" (only 1 */
```

```
/* member matches criteria) */
IF (STEP01 < 8) THEN /* if copy successful */
STEP02 RUN JOB (DSN="xxNT") SNODE - /* run "data modify" job */
SYSOPTS=\"PGM(fix.bat)\ || -
\ARGS (PO_num)"\
STEP03 COPY FROM (DSN=MUNGE.ME SNODE) - /* and bring file back */
TO (DSN=MODIFIED || %SUBDATE)
ELSE
/* or if step 1 failed */
STEP04 RUN TASK (PGM=DMNOTIFY, PARM=('FAIL', FILEA || %SUBDATE)) PNODE
```

A description of the Process follows:

COPY01 is a PROCESS statement that identifies the secondary node (SNODE) as CD.CHICAGO. The SNODE is the Connect:Direct node that interacts with the primary node (PNODE) during Process execution. The SNODE can also be referred to as the participating, target, or remote node. A remote node must be specified in every Process.

The PNODE is the Connect:Direct node on which the Process is submitted. The PNODE may also be referred to as the local node. PNODE is used for documentation only.

STEP01 is a COPY statement that copies a file on the PNODE to a file on the SNODE.

STEP02 and STEP03 use Conditional statements. If STEP01 completes successfully (that is, the return code [RC] is less than 8), the THEN path is taken and STEP02 and STEP03 execute. If STEP01 fails, the ELSE path is taken and STEP04 executes.

STEP04 is a RUN TASK statement. The DMNOTIFY program executes within the Connect:Direct environment.

Sample Process with Session Token for Connect:Direct Interoperability

The following BPML assigns the process token to track the open session and handles the session end if any step fails in the On-Fault service:

```
<process name = "CD_Server_Submit_test">
<sequence>
<operation name="CD Server Begin Session Service">
<participant name="CDServerBeginSession"/>
<output message="CDServerBeginSessionServiceTypeInputMessage">
<assign to="LocalCDNodeName">giscdservice</assign>
<assign to="RemoteCDNodeName">remotenode</assign>
<assign to="RemotePasswd">password</assign>
<assign to="RemoteUserId">user</assign>
<assign to="." from="*"></assign>
</output>
<input message="inmsg">
<assign to="." from="*"></assign>
</input>
</operation>
<operation name="CD Server Submit Service">
```

```
<participant name="CDServerSubmit"/>
<output message="CDServerSubmitServiceTypeInputMessage">
<assign to="RemoteProcessFile">'c:\program files\connect direct
v4.1.00\server\process\sample.cdp'</assign>
<assign to="SessionToken">SessionToken/SessionId/text()</assign>
<assign to="." from="*"></assign>
</output>
<input message="inmsg">
<assign to="." from="*"></assign>
</input>
</operation>
<operation name="CD Server End Session Service">
<participant name="CDServerEndSession"/>
<output message="CDServerEndSessionServiceTypeInputMessage">
<assign to="SessionToken">SessionToken/SessionId/text()</assign>
<assign to="." from="*"></assign>
</output>
<input message="inmsg">
<assign to="." from="*"></assign>
</input>
</operation>
<onFault>
<operation name="CD Server End Session Service">
<participant name="CDServerEndSession"/>
<output message="CDServerEndSessionServiceTypeInputMessage">
<assign to="SessionToken">SessionToken/SessionId/text()</assign>
<assign to="." from="*"></assign>
</output>
<input message="inmsg">
<assign to="." from="*"></assign>
</input>
</operation>
</onFault>
</sequence>
</process>
```

Tracking Activities in Connect:Direct Interoperability

You track business process activities performed between Sterling Integrator and Connect:Direct within the existing reporting infrastructure of each product. From Connect:Direct you can locate activities generated from Sterling Integrator, or you can use hyperlinks in the Connect:Direct browser to view the Business Process Details page in Sterling Integrator.

To further enhance tracking between Sterling Integrator and Connect:Direct, correlation records are automatically created so that you can search for Processes or documents using any one of several name/value pairs.

This section covers the following topics:

✦ Overview of Tracking Processes in Connect:Direct Interoperability

✦ Tracking Process Activity in Connect:Direct Interoperability

✦ Monitoring Business Processes for Connect:Direct Interoperability

✦ Business Document Tracking Scenario for Connect:Direct Interoperability

Overview of Tracking Processes in Connect:Direct Interoperability

Processes can be tracked on local and remote nodes to see that they were successfully executed or if there were errors. Tracking is enabled during the execution and for specified time after completion.

Tracking Processes on the Local Node

Select Process and Select Statistics are the two Connect:Direct functions that allow you to track activity on a *local* Connect:Direct server. The local server may be the PNODE or the SNODE of the activity you are tracking. You can run these functions from any of the Connect:Direct client installations, including:

✦ Connect:Direct Requester

✦ Interactive User Interface

✦ Connect:Direct Browser User Interface

To track activity that occurred with Sterling Integrator as the *local* node, do not use these Connect:Direct functions. Use the **Business Processes** menu features or the Sterling Integrator logging files.

Tracking Processes on the Remote Node

You can use the Sterling Integrator Connect:Direct Requester adapter to issue Select Process and Select Statistics commands to track activity on a *remote* Connect:Direct server. Do this by using the following Connect:Direct Requester services in a business process:

✦ Connect:Direct Requester Select Process service

✦ Connect:Direct Requester Select Statistics service

When using a non-Sterling Integrator Connect:Direct server, you can view details of process activity on a remote node with the Connect:Direct browser user interface.

When you issue a Select Process or Select Statistics command from the Connect:Direct browser user interface for a Process, and the activity is on a Sterling Integrator Connect:Direct node, a hyperlink is displayed to enable you to jump to Sterling Integrator. The hyperlink gives you access to the Correlation and Monitor feature so you can view details of the related business process.

Note: If you specify a ProcessName in the Connect:Direct Server Begin Session service, the hyperlink is not active.

Tracking Process Activity in Connect:Direct Interoperability

The Connect:Direct Browser User Interface enables you to monitor Connect:Direct Processes on a Connect:Direct node and in Sterling Integrator from an Internet browser, such as Microsoft Internet Explorer or Netscape Navigator. Use the Connect:Direct browser user interface to connect to a non-Sterling Integrator node to track activity.

You can perform a Select Process command to view detailed records of all current, ongoing Processes that are running on the server. You can also perform a Select Statistics command to view statistical Process record information on completed Processes. Each Connect:Direct Process references a unique Process number as its primary Process identifier.

Select Process

Use Select Process to view detailed records of all current, ongoing Processes as they progress through a local Connect:Direct node. The local node may be functioning as the PNODE or the SNODE in the Process you are tracking.

You can choose the Processes to display according to selection criteria such as Process name and number, SNODE, queue, status, or submitter node and user ID. You can track Processes that are running on the local server as either PNODE or SNODE.

After you make your selections and click **Select Process**, summary Process information is displayed. You can then choose to display detailed information about a particular Process. For non-Sterling Integrator nodes, you can also change, delete, or suspend a Process from this browser interface.

Select Statistics

Connect:Direct maintains statistics on all Connect:Direct activity, including completion records for each step of a Process. On non-Sterling Integrator nodes, you use the Select Statistics page to view statistical Process record information on completed Processes.

You can retrieve statistics based on various criteria, such as Process name, start and stop date, start and stop time, and so forth.

After you make your selections and click **Select Statistics**, summary statistics are displayed. You can then get detailed statistics about a particular Process.

Connect:Direct Browser Hyperlink

When you use the Select Process or Select Statistics pages in the Connect:Direct browser user interface, you can track Connect:Direct Processes on a Connect:Direct node and in Sterling Integrator. For those Processes associated with a Sterling Integrator Connect:Direct node, hyperlinks take you to Sterling Integrator Monitor pages to retrieve detailed information.

Note: The Link Properties must be configured before use. To configure hyperlink properties, see *Configuring Connect:Direct Browser Hyperlink Properties*.

For example, if a remote Connect:Direct node initiates a Process to copy files to Sterling Integrator, the Connect:Direct browser enables you to view information about this process. When Process information is displayed, a hyperlink is available that takes you to the Correlation Search Results page in Sterling Integrator to view information associated with that Connect:Direct Process. You can expand your search to determine where else the document (file) transferred, such as to a mailbox. With the document ID, you can track all activity associated with the document.

Note: If you specify a ProcessName in the Connect:Direct Server Begin Session service, the hyperlink is not active.

Monitoring Business Processes for Connect:Direct Interoperability

The Sterling Integrator Admin Console enables you to view information about business processes that interact with remote Connect:Direct nodes. Correlation records are automatically maintained so that you can search for specific information (such as, business process IDs, document IDs, workflow IDs, and mailbox IDs). Each business process references a unique business process ID as its primary process identifier.

The tracking and search functions available to track Sterling Integrator business processes, Connect:Direct Processes, and Connect:Direct adapter activity are described in the following table:

Tracking Option	Description
Central Search	Use to search for live (active) business process instances that do not appear in the Current Processes. Search by Name, Status, or Date.
Current Processes	Lists the status of the ten most recent business process instances.
Current Activities	Search for Connect:Direct Server adapter activity by adapter configuration name or by when the activity registered within Sterling Integrator.
Advanced Search	
Business Processes	Search for active, archived or stored business processes. Search by business process instance ID, business process Name, State, or Date.
Documents	Search for active, archived or stored documents handled by a business process. Search by Time, Document ID, Sender or Receiver ID, Type, Status or Correlations.
Correlation	Search for active, archived or stored business processes by name-value pairs. This is a key tracking method in interoperability because you can search by values such as PNODE, SNODE, Connect:Direct Process Name and so forth.

When you find the business process you are interested in on any of these Monitor pages, you can obtain additional details by selecting the number in the ID column to open the Business Process Details page.

Business Process Detail

The Business Process Detail page is accessed from any page that contains the business process ID. This page provides a progress report about a specific business process instance. In addition, you can stop or restart the business process from this page.

Following is a partial list of the information you can obtain from this page:

✦ The business process definition (the BPML file)

✦ The current state of each step in a business process

✦ The date and time a business process started and ended

✦ The contents of the process data and the primary document at each step of the business process

Current Processes Monitor

Selecting **Business Processes** > **Current Processes** opens the Monitor page with a list of the processes currently running in Sterling Integrator. A Green status indicates no errors or warnings occurred during processing. A Red status indicates errors or warnings encountered during processing. Use this page to:

✦ Review detailed processing information by clicking on the ID of the process.

✦ View the business process definition by clicking on the Name of the process.

✦ View the current state of a business process.

✦ View the date and time a business process Started and Ended.

Current Activities Monitor

Selecting **Business Processes** > **Current Activities** opens the Service Activity search page. The Service Activity page enables you to monitor activity of several adapters, including the Connect:Direct Server adapter. When you select an adapter to monitor, activity detail occurring on the adapter is displayed.

If the Connect:Direct Server adapter is used by a business process that has stopped running, you can use this feature to determine whether the adapter is preventing the business process from running.

The results of an activities search includes the following information:

✦ Session identifier
✦ Node name
✦ When the activity started and when it last updated

Correlation Search

Correlation searches are a key to relating a Connect:Direct Process with a Sterling Integrator business process. Whereas Connect:Direct identifies a Process with a *Process Number* and a *Process Name*, Sterling Integrator identifies its business processes with an *Instance ID*.

Note: A Process/business process that involves two Connect:Direct nodes does not create a unique identifier. Correlations are created to identify related Sterling Integrator and Connect:Direct Processes.

The Connect:Direct Server adapter and related services automatically write Sterling Integrator correlation records to enable searches for business processes and documents containing certain correlation identifiers.

The Correlation Search page enables you to search for business process activity according to six Connect:Direct specific name-value pairs, including:

✦ CD_LocalFileName
✦ CD_RemoteFileName
✦ CD_ProcessName
✦ CD_ProcessNum
✦ CD_PnodeName
✦ CD_SnodeName

Note: Do not perform a correlation search by Process Number only. A Process Number is unique to a single Connect:Direct server, therefore you may see the same Process Number used for different Processes – each associated with a different node.

Business Document Tracking Scenario for Connect:Direct Interoperability

The following scenario shows how reporting and search capabilities in Connect:Direct and Sterling Integrator work together. MaxxMart, the fictitious retailer discussed in *Sample Business Process Scenario for Connect:Direct Interoperability*, has not received the disbursement of loan funds from Contempo for a customer who purchased a high ticket item.

Contempo, who has the role of Main trading partner, has Connect:Direct installed. MaxxMart has Sterling Integrator installed and has configured the Connect:Direct Server adapter to establish interoperability between the two applications. Contempo defined a remote node in its Connect:Direct network map for the MaxxMart adapter.

MaxxMart contacts Contempo to find out why they did not receive their funds. The following steps show how Contempo can use interoperability between Connect:Direct and Sterling Integrator to figure out what happened to the MaxxMart payment.

1. Contempo accesses the Connect:Direct browser interface and executes a Select Process to view all Processes that involved MaxxMart as a PNODE that ran on the date in question. The two companies have an established business process where MaxxMart submits a Process on the Contempo Connect:Direct server that transfers approved loan funds to the MaxxMart bank account.

2. The Select Process results page displays matching Processes. Contempo notices a business process name that is a "B" followed by a number (such as B12345). This indicates that the number is a Sterling Integrator business process ID. The process number is hyperlinked to Sterling Integrator and provides detailed business process information. Contempo clicks the appropriate hyperlink to track the business process activity.

3. When Contempo tracks the business process detail, it sees that the HTTP Server adapter, which is required to execute an ACH transfer over AS2, was down at the time the dispersal was processed. Although the business process logged the error, this information was not returned to the Contempo Connect:Direct server.

4. Contempo realizes it must notify MaxxMart that it must modify the business process to capture any downstream failures that prevent a transfer and return this status information to the Contempo node so the Process can be resubmitted at a later time.

Chapter 7

Troubleshooting Connect:Direct Interoperability

Sterling Integrator and Connect:Direct are designed to work together, in a seamless and tightly integrated environment. However, as is the case with any application, occasions may occur when you need to troubleshoot certain components or functions.

This section provides general troubleshooting guidelines when configuring and using Sterling Integrator with Connect:Direct.

Note: To troubleshoot general Connect:Direct functions, see the Connect:Direct documentation set for general troubleshooting information and instructions.

Note: You may need to work with your Trading Partners or system administrators to troubleshoot the systems you are communicating with.

Verifying Connectivity for Connect:Direct Interoperability

To verify connectivity between Connect:Direct and Sterling Integrator:

1. Check configurations on Connect:Direct and Sterling Integrator for compliance. In particular, look at the network maps on both systems.

2. Verify that the Connect:Direct nodes in question are active when a *begin session* is invoked. Search for the Sterling Integrator adapter configuration in the Browser User Interface and verify that the adapter is enabled.

3. Verify that perimeter services client connects to perimeter services server. If the client cannot connect, it causes the perimeter services-enabled Connect:Direct Server adapter to fail.

   Perimeter servers do not automatically reboot after a failure.

   To determine the status of the perimeter services client in Sterling Integrator:

   a. From the Sterling Integrator **Operations** menu, select **Troubleshooter**.

   b. Look for the **Perimeter Servers** area. It is usually at the bottom of the Troubleshooting page. This shows the state of the perimeter server clients which are defined in Sterling Integrator and whether they are on.

      Disconnected is displayed if no perimeter server is installed.

   c. Make certain the client is enabled.

Exchanging Process IDs in Connect:Direct Interoperability

If either Connect:Direct or Sterling Integrator cannot exchange process identifiers, the process correlation in the various monitor user interfaces does not work for the particular instance of a process. When this occurs, correct the identifiers and restart the process.

Business Process Permissions

If you receive permissions-related error messages, make sure that adequate permissions have been assigned.

When a external request is received by Sterling Integrator to execute a business process, the user/proxy user must have business process permissions for the specific business process that is to be executed. That is, the business process itself must have permissions enabled when it is created. In addition, the Sterling user account must have:

✦ General business process execution permission. This is acquired by assigned the Business Processes group to the user account.

✦ Permission for the specific business process to be executed.

   The business process will display in the drop down with the maiboxes in the user account configuration windows.

Using the Graphical Process Modeler for Connect:Direct Interoperability

The following restrictions apply to using the Graphical Process Modeler:

✦ Do not attempt simultaneous **COPY** operations for the same node.

✦ Issue a **Close Session** for each open session when session is finished.

Restarting Copy Interruptions in Connect:Direct Interoperability

Automatic Retry for Interrupted or Failed Copy Transactions

The Wait service is used automatically by Sterling Integrator in the event of a failure of the remote Connect:Direct node that interrupts a business process, such as one that is performing a Connect:Direct copy operation.

A business process suspended by the Wait service needs to be resumed by the scheduled system process Schedule_BPExpirator. By default, the BPExpirator is scheduled to run every 15 minutes. The BPExpirator schedule can influence checkpoint restart for the adapter.

If Sterling Integrator stops responding during a copy transaction, and the recovery level is set to Auto-Resume, the business process resumes automatically at next Sterling Integrator start up.

Checkpoint Restart

The Connect:Direct Server adapter includes parameters to govern checkpoint and restart behavior if either Sterling Integrator or the remote node fails. If the remote Connect:Direct server or the network fails during a copy operation, the Connect:Direct Server adapter goes into a retry mode using the values specified at configuration. The adapter waits for the configured amount of time and then resumes the copy.

Two values impact the amount of time the Connect:Direct Server adapter actually waits to resume copy. The first value is the *Interval between Retry attempts (minutes)* as specified in the Connect:Direct Server adapter configuration. The second value is the frequency defined by the scheduled system process *Schedule_BPExpirator*. The larger value governs the checkpoint restart.

For example, if the Interval between Retry attempts is set to 10 minutes, and the Schedule_BPExpirator is scheduled to run every 15 minutes, the retry occurs at the next scheduled 15 minute interval. Set Schedule_BPExpirator to a much lower number, such as one minute, to achieve the fastest restart.

Checkpoint restart is enabled even when SNODE compression is on.

Checkpoint restart is only enabled for file system or mailbox based documents.

Purging Checkpoint Data

Sterling Integrator stores checkpoint information for 30 days, after which it is automatically purged. If your database is corrupted, you must purge this checkpoint information by performing a cold restart.

To purge checkpoint data:

1. From the Business Processes menu, search for the adapter configuration.

2. Edit the configuration to set **Server Start Option** to **Cold**.

3. Save the changes and click Finish.

4. The Sterling Integrator adapter restarts. The checkpoint data is purged during startup.

5. Edit the configuration again to set Server Start Option to Warm to continue using Checkpoint Restart without a loss of information between multiple sessions.

Logging Files for Connect:Direct Interoperability

More information, including audit messages and error messages, can be found in Sterling Integrator log files. Log files are available through the **Operations** > **System** > **Logs** menu.

The *cdinterop.log* files record details for all adapter activity and business processes that involve the Connect:Direct Server and Requester adapters and the related Connect:Direct services.

Note: A new log is created each time the Sterling Integrator server is stopped. If it is not stopped during a given day, the log grows with each Connect:Direct transaction.

By default, the cdinterop.log file captures audit level messages, even when logging is not enabled. When the log is enabled, all transactions are recorded, including:

✦ Error messages

✦ Adapter startup and shutdown

✦ Adapter changes

✦ Security checks

Turning on Logging

If the error is not in the logs, turn on the Sterling Integrator cdinterop.log to capture activity of the Connect:Direct Server adapter and the services:

1. Browse to **Operation > System > Logs**.
2. Scroll to the Environment section of the page.
3. Click the edit icon to the left of Connect:Direct **Server and Requester Adapter and Services**.
4. In the Environment window, select **On** next to Logging Level and click **Save**.
5. Attempt to recreate the problem.
6. View the log for more informative entries.

Error Messages in Connect:Direct Interoperability

The following table lists error messages from Sterling Integrator that you may encounter and describe the system action and appropriate response to clear the problem.

Error Number	Error Message	System Action	Response
JGIS001E	Mailbox doesn't exist	Could not access mailbox in Sterling Integrator.	Check the mailbox path in Sterling Integrator.
JGIS002E	No sufficient permission on mailbox	Could not access mailbox in Sterling Integrator.	Check user permission on mailbox in Sterling Integrator.
JGIS003E	File is not extractable from mailbox	Could not read file from mailbox in Sterling Integrator.	Check the file extractability.
JGIS004E	Error when completing file writing	Could not complete file writing in Sterling Integrator.	Collect the Sterling Integrator Connect:Direct Server log files and contact Sterling Commerce Customer Support.
JGIS005E	Document after copy is null	Could not get a valid document after copy.	Collect the Sterling Integrator Connect:Direct Server log files and contact Sterling Commerce Customer Support.
JGIS006E	Error launching a business process	Could not start a business process in Sterling Integrator.	Check the business process in Sterling Integrator.
JGIS007E JGIS008E	Error adding a message to mailbox	Could not add a message to mailbox in Sterling Integrator.	Check the mailbox path or the user permission on the mailbox in Sterling Integrator.
JGIS009E	User token is null	Could not check user token in Sterling Integrator.	Check the user token in Sterling Integrator.
JGIS010E	Mailbox path is null	Could not check mailbox path in Sterling Integrator.	Check the mailbox path in Sterling Integrator.
JGIS011E	Error querying message	Could not query message from mailbox in Sterling Integrator.	Check file name and verify message with the file name existed in mailbox.
JGIS012E	File can not be found	Could not find the file.	Check the file name and ensure the file exists
JGIS013E	Document ID is null	Could not check the document ID.	Check the document ID used in Sterling Integrator.
JGIS014E	Error extracting a message from mailbox	Could not extract a message from mailbox.	Check the message in Sterling Integrator mailbox and ensure it is extractable.
JGIS015E	Error when completing a message extract from mailbox	Could not complete a message extract from a mailbox.	Check the message in Sterling Integrator mailbox and ensure it is extractable.

Error Number	Error Message	System Action	Response
JGIS016E	Error when getting a file pointer	Could not get a file pointer.	Collect the Sterling Integrator Connect:Direct server log files and contact Sterling Commerce Customer Support.
JGIS017E	Error when getting file length	Could not get file length.	Collect the Sterling Integrator Connect:Direct server log files and contact Sterling Commerce Customer Support.
JGIS018E	Error when reading file	Could not read from a file.	Collect the Sterling Integrator Connect:Direct server log files and contact Sterling Commerce Customer Support.
JGIS019E	Error when writing file	Could not write to a file.	Collect the Sterling Integrator Connect:Direct server log files and contact Sterling Commerce Customer Support.
JGIS020E	Error when seeking in a file	Could not seek in a file.	Collect the Sterling Integrator Connect:Direct server log files and contact Sterling Commerce Customer Support.
JGIS021I	Invalid UserId	Could not find user in Sterling Integrator.	Check the User ID specified.
JGIS022I	Invalid Password	Could not authenticate the user in Sterling Integrator.	Check the User ID and Password specified.
JGIS023I	UserId or Password Error	Could not authenticate the user in Sterling Integrator.	User ID or Password is not specified.
JGIS024I	Invalid Business Process	Could not access the business process in Sterling Integrator.	Check the business process in Sterling Integrator.
JGIS025I	Business Process Permission Error	Could not access the business process in Sterling Integrator.	Check the User Permissions associated with the business process in Sterling Integrator.
JGIS026I	Generic Error	Could not initiate the business process in Sterling Integrator.	Check the logs and business process in Sterling Integrator.
JGIS027I	Document Timeout Error	Timed out waiting to get document from a business process in Sterling Integrator.	Check the logs and business process in Sterling Integrator.
JGIS028I	Document Retrieval Error	Could not get the document from the business process in Sterling Integrator.	Check the logs and business process in Sterling Integrator.
JGIS029I	Illegal State Error on Connect:Direct Server During Call-Back	Could not initiate business process in Sterling Integrator.	Check the logs and business process in Sterling Integrator.

Error Number	Error Message	System Action	Response
JGIS030I	Session Error	Could not find the session.	Check the logs and business process in Sterling Integrator.
JGIS031I	Invalid File URL Error	Could not validate file URL specified in copy.	Check the file URL specified in copy statement.
JGIS032I	Mailbox Error	Mailbox Error while searching/retrieving Mailbox in Sterling Integrator.	Check the logs and business process in Sterling Integrator.
JGIS033I	Invalid Local Connect:Direct Server Error	Could not find local Connect:Direct Server on Sterling Integrator	Check the logs and business process in Sterling Integrator.
JGIS034I	Connection Timed Out Error	Could not establish connection before timeout.	Check the logs and business process in Sterling Integrator.
JGIS035I	Forwarding RunJob BP Error	Could not initiate the business process in Sterling Integrator.	Check the business process for proper RunJob configuration.
JGIS036I	Forwarding RunTask BP Error	Could not initiate the business process in Sterling Integrator.	Check the business process for proper RunTask configuration.
JGIS037I	Generic GIS Service Error	Could not initiate the business process in Sterling Integrator.	Check the logs and business process in Sterling Integrator.
JGIS038I	Generic GIS Error	Could not initiate the business process in Sterling Integrator.	Check the logs and business process in Sterling Integrator.
JGIS039I	NetMap Checking Error	Could not perform netmap checking in Sterling Integrator.	Check netmap for valid remote node.
JGIS040I	Invalid Business Process Permission Error	Could not access the business process in Sterling Integrator.	Check the User Permissions associated with the business process in Sterling Integrator.
JGIS041I	Invalid Parameter Value Error	Could not initiate the business process in Sterling Integrator.	Check the parameter value for the right format.

Index