

Quest® Coexistence Manager™ for Notes
3.9.1

User Guide



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Legend

 **CAUTION:** A CAUTION icon indicates potential damage to hardware or loss of data if instructions are not followed.

 **IMPORTANT NOTE, NOTE, TIP, MOBILE, or VIDEO:** An information icon indicates supporting information.

CMN User Guide
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About the CMN Documentation Suite

The documentation for Quest Coexistence Manager for Notes (CMN) includes:

- **Release Notes** (printable PDF): Describes the current CMN release—any new and enhanced features, resolved issues, and known issues. Also documents minimum installation requirements, and provides Quest contact information.
- **Quick-Start Guide** (printable PDF): An orientation to the product's basic purposes, features and capabilities, with a case study showing how its primary components are most commonly used within a typical coexistence scenario. Also explains how to download and install the software.
- **CMN User Guide** (printable PDF): Comprehensive documentation of CMN's three primary components: Directory Connector, Mail Connector and Free/Busy Connector. Describes component capabilities, deployment considerations, configuration instructions and tips, and application notes and screen-by-screen field notes for CMN's Management Console software tools.
- **FBC Scenarios Guide** (printable PDF): Provides process instructions and application notes for installing and configuring CMN's Free/Busy Connector (FBC) in a variety of Exchange-side scenarios.
- **CMN Program Parameters Reference** (printable PDF): Listing of all CMN program parameters that are not associated with UI fields in CMN's Management Console, with descriptions and default values and usage/application notes. (Parameters associated with UI fields do appear in the *Configuration.xml* files, but should not be edited manually.)
- **Management Console Online Help** (three compiled Windows Help files, one for each CMN component): Field notes and application notes for the screens and features of CMN's Management Console.

All CMN documentation is intended for network administrators, consultants, analysts, and any other IT professionals who will install or use the product components, or who may help plan for their use in a coexistence scenario. All of these documents, including the online Help, are bundled and installed with the product, and all except the Help files are also available separately at Quest's [Support Portal](#).

Where To Look in the CMN Documentation

This table shows where you can find particular types of information about particular CMN components:

	for Dir Connector & Mail Connector	for Free/Busy Connector
Introduction and orientation:	— — CMN Quick-Start Guide and User Guide — —	
System requirements:	— — CMN Release Notes — —	
Installation instructions:	— — CMN Quick-Start Guide — —	
Configuration instructions:	CMN User Guide	CMN FBC Scenarios Guide
Operating instructions:	— — CMN User Guide — —	
Troubleshooting info:	CMN User Guide	CMN FBC Scenarios Guide

The CMN application Help files contain the same information as the *User Guide*, but make the information available on-screen at a single keystroke (from the CMN Management Console).

All CMN documentation is intended for network administrators, consultants, analysts, and any other IT professionals who will install or use the product components, or who may help plan for their use in a coexistence scenario. All of these documents, including the online Help, are bundled and installed with the product, and all except the Help files are also available separately at Quest's [Support Portal](#).

Introduction

- [Welcome to Quest Coexistence Manager for Notes](#)
- [The CMN Management Console](#)
- [CMN Performance Counters for Windows' System Monitor](#)

Welcome to Quest Coexistence Manager for Notes

Quest Coexistence Manager for Notes (CMN) provides rich directory, email and calendar coexistence features between Lotus Notes and Microsoft Exchange, or a hosted Exchange environment such as Microsoft's Office 365. CMN can be deployed either for a finite transition period, as when migrating from Notes to Exchange, or for indefinite or even permanent coexistence.

Effective coexistence between the Notes and Exchange environments will address these three primary coexistence needs:

- **Directory coexistence:** Most organizations routinely experience staff additions, departures and transfers. These staff changes introduce data inconsistencies between the two environments' directories. A directory update reconciles these differences by updating the contents of one directory to match the contents of another. A bidirectional update ensures that both directories contain *all* of the organization's users, resources and groups.
- **Mail coexistence:** Simple, direct SMTP mail routing is easy to configure, but does not preserve or compensate for substantial cross-platform losses in the fidelity of message contents: attributes, attachments, calendar data, and so forth. Notes and Exchange environments offer similar email and calendar capabilities, but implement many features differently. Outlook therefore does not handle certain message types that originate in Notes, and vice versa. Often the recipient client can display the pertinent information correctly, but cannot perform the calendar updates that would have been automatic if the recipient and sender were using the same email system. Or sometimes the receiving client can perform automatic calendar updates, but introduces errors— incorrect times, missing dates, or extraneous meetings, etc.
- **Free/Busy coexistence:** The Notes and Exchange environments implement calendar free/busy queries differently, making each side blind to the availability status of users on the other systems. The calendar applications on both sides need some mechanism to determine the free/busy status of users within the other environment.

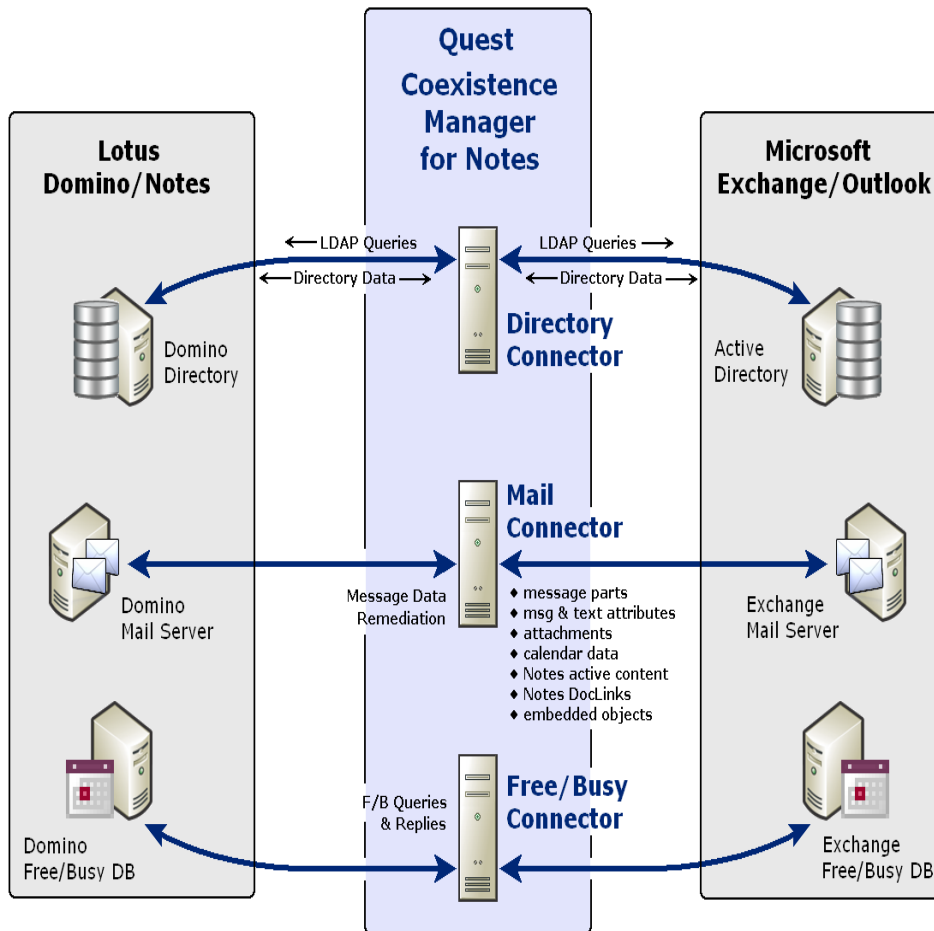
CMN's three primary components

Quest Quest Coexistence Manager for Notes includes three primary components to meet the needs listed above:

- **Directory Connector:** Updates directory data between the Domino Directory and Active Directory, configurable for any number of servers.
- **Mail Connector:** Provides email remediation to permit intact delivery of most message parts, message and text attributes, attachments, Notes DocLinks, and embedded objects, as well as messages carrying calendar and resource-booking data, and Notes "active content" messages.

- **Free/Busy Connector:** Facilitates the exchange of calendar free/busy data between users in the two different environments.

These three CMN components are separate but designed to work together in any combination to suit a broad range of coexistence needs. The components are described separately in greater detail in the next three chapters of this *User Guide*—what they do, how to install and configure them, and what you can do with them once they are up and running.



Deployment considerations

Before installing CMN, it is important to document a deployment plan. The plan should specify the components you will install, where they will be installed, and how many instances of each will be required. Remember to accommodate all system requirements (as documented in the most recent RTM *Release Notes*) when planning component deployments. You can install and configure any number of CMN components, in any order you like, but consider that the Directory Connector provides directory updates that the Free/Busy Connector will need to function.

It is possible to install two or more CMN components on a single server, but production environments with higher volumes of message and free/busy traffic may benefit from installing on separate servers for optimal performance. One common approach installs the three CMN components to three separate computers, one for each component (in addition to the Free/Busy Connector's QCalCon, which must be installed separately on a Domino server).

Environments with very high message volume may also deploy multiple Mail Connectors and/or install the Free/Busy components on different computers. For example:

CMN Server: Directory Connector
CMN Server: Mail Connector 1
CMN Server: Mail Connector 2
CMN Server(s): Mail Connector ... [n]
CMN Server: Free/Busy Connector for Notes-to-Exchg F/B queries
CMN Server: Free/Busy Connector for Exchg-to-Notes F/B queries
Domino Server: QCalCon (required for F/B Connector)

For technical reasons, the QCalCon subcomponent of the Free/Busy Connector *must* be installed on a Domino server. But if the Domino environment contains more than one Domino server, QCalCon is installed on only one server. (Other Domino servers must be configured to find and use the single QCalCon instance on the "bridgehead" server.) The other four Free/Busy Connector subcomponents can be installed on a single computer, although deployment to two separate computers (as illustrated in chapter 4 below) will improve performance in environments with higher volumes of F/B queries and replies.

The relative processing demands and hardware requirements of CMN components vary based on typical activity in different environments. The F/B Connector usually exerts the heaviest demand on computing resources, compared to the other two CMN components. The Mail Connector runs continuously, but in most settings its email and calendar remediation functions are less demanding than the F/B Connector. Meanwhile, Directory Connector activity is typically scheduled and consumes resources only during active processing, so its resource requirements are typically lower than either the Mail Connector or F/B Connector.

Installation instructions for CMN components appear in the *Getting Started* sections of the *Release Notes* and the *CMN Quick-Start Guide*. After installation, CMN components must be configured before they can be used. Deployment and configuration options for the three primary CMN components vary to accommodate local environments and needs. These considerations are more fully explained in chapters 2, 3 and 4 of this *User Guide* and, for the Free/Busy Connector, in the *FBC Scenarios Guide*.

About Quest license keys

Quest Coexistence Manager for Notes will run only after applying a valid license key. Quest Software Inc. sells CMN license keys by numbers of users served within the combined Notes-Exchange environment. A single license key is valid for all three CMN components.

You can obtain license keys by contacting your Quest sales representative. When you obtain a license key, you must install it to enable the product. A license key is an .asc-type file that Quest sends to you with an email. You must save the file to your hard disk, and then install it in the CMN Management Console, on the **Common | Licenses** screen. The installation of a valid license key authorizes and enables the use of all CMN components.

The CMN Management Console

CMN components are configured within CMN's *Management Console* application, where you specify the names and locations of mail servers and directories, locations of web services, comm port numbers, scope of operations, operational preferences, scheduled runs, and so forth. The Management Console is an "umbrella" application used to configure all three CMN components. Different components' settings are managed on different screens.

The CMN Management Console is a friendly interface between you and a set of configuration files that CMN components read every time they are started. Configuration settings for CMN's different components are saved in separate configuration files: a *Configuration.xml* file for each of the Directory Connector and Mail Connector (two files saved in the different CMN component subfolders), and another set of configuration files for the Free/Busy Connector. The Management Console provides GUI screens with labeled fields to simplify entering and editing the configuration settings in those files.

The next few pages describe the basic operating concepts of the CMN Management Console. Later chapters will provide the screen-by-screen field notes for the three components, with component configuration instructions.

To start the CMN Management Console:

- Select the *Management Console* start-up shortcut from your Windows **Start** menu: **Start | Programs | Quest Quest Coexistence Manager for Notes | ...**. The CMN installer copies this shortcut to the submenu of every installed CMN component (use these shortcuts):
 - ... | Directory Connector | Coexistence Manager for Notes Management Console
 - ... | Mail Connector | Coexistence Manager for Notes Management Console
 - ... | Free/Busy Connector | Coexistence Manager for Notes Management Console

When you start the Management Console, the program automatically loads the currently active configuration values for whatever CMN components are installed on the same computer. Once the Console is running, however, component configuration data is saved and opened separately, for one component at a time.

The Management Console runs in a window with a navigation sidebar down the left side, as shown in the sample screen above.

The list of the Console's screens in the sidebar lets you select which screen you want to display. Console screens are grouped by component, and you may view them and work on them in any order. The screens in the **Common** group (bottom of the sidebar list) contain features that pertain to all three components.

Management Console menus

CMN's Management Console screens offer two menus, near the top-left corner of any Console screen:

- [File menu](#)
- [Help menu](#)

File menu

The CMN Management Console **File** menu lets you open, save or activate the *configuration.xml* file for any CMN component(s) that are installed on the computer where you are running the Console application. See the examples at right.

File menu options are:

- **Open Configuration:** Discards any unsaved settings within the Management Console (from the current Console session) for a single CMN component, and reloads the last-saved configuration settings for that component. When you select this **Open** option, a submenu (as shown above) prompts you to specify the component whose configuration file you want to open. (The submenu list varies depending on which CMN components are installed.)

If you select **Directory Connector** or **Mail Connector**, the Console presents a standard Windows **Open** dialog box, with the currently active configuration file selected by default. Click **Open** to open the selected file, or specify some other configuration file and click **Open**.

If you select **Free/Busy Connector**, the Console opens the Free/Busy Connector configuration data into the Console screens. (The F/B Connector configuration files cannot be renamed from their defaults.)

- **Save Configuration:** Saves the current configuration settings as they now appear within the Management Console for a single CMN component. When you select this **Save** option, a submenu prompts you to specify the component whose configuration data you want to save.

If you select **Free/Busy Connector**, the Console saves the F/B Connector configuration data to the F/B Connector configuration files. (The configuration filenames cannot be changed from their defaults.)

If you select **Directory Connector** or **Mail Connector**: This **Save** command presents a standard Windows **Save As...** dialog box. Click **Save** to save the data to the default configuration file, or specify some other filename and click **Save**. For CMN's Directory Connector (DC), the **Save** command also saves the configuration data for any DC connector that has been created or edited by DC's Connector Creation Wizard in the current Console session.



CAUTION: The DC's Connector Creation Wizard does *not* save its data to disk. You must explicitly Save the data from the Management Console to the CMN DC configuration files.

- **Activate Configuration:** Restarts the selected CMN component, and loads the settings currently open in the Console as the active configuration for the component. When you select this **Activate** option, a submenu prompts you to specify the component whose settings you want to activate. (If the currently open settings have not yet been saved to disk, CMN prompts you to **Save** them before it will execute the **Activate** command.) The Console then prompts you to confirm or cancel the **Activate** command, since it requires restarting (interrupting) the selected component. If you choose to *not* restart the service or save the open configuration file now, the current configuration settings will remain in effect until the next component restart.

Help menu

The **Help** menu offers direct access to the on-line Help files for the Management Console—different Help files for the three different CMN components. In addition to the **Help Topics** option, the **Help** menu also offers:

- **Search Support Portal and Knowledgebase:** Opens a browser window to visit the Quest Software Inc. website for CMN's online *Support Portal and Knowledgebase*, where you can browse and search more information about Quest Coexistence Manager for Notes.
- **Visit the Community:** Opens a browser window to visit the Quest Software Inc. website for the *CMN Online Community*, an interactive community dedicated to issues relating to coexistence. The community is designed to foster collaboration between Quest coexistence experts and users. This community is a place where you can:
 - Learn about product releases and betas before anyone else.
 - Get access to Quest product leaders and subject matter experts on coexistence and migration.
 - Participate in discussion forums, share insights and ideas, and get common questions answered.

You can browse the forums and the library, but to take full advantage of the community, post new threads, respond to messages from others, rate our documents and downloads, you must become a registered member. If you already have a Quest account or are a member of another Quest community, simply log in. The *Login* and *Register* features are both available from links in the top-left corner of the page.

- **Check for Updates:** Opens a browser window to visit the Quest Software Inc. website showing all available versions of the CMN product, where you can optionally download a later version.
- **About:** Identifies the specific release of the software, and declares Quest's intellectual property rights for the software. The dialog box also shows information about your Quest Coexistence Manager for Notes installation, including details about your license. You can view and update license information here.

The *Common* group of Console screens

The features on these screens apply to CMN as a whole, rather than to any single CMN component.

- [Management Console screen: Common | Services](#)
- [Management Console screen: Common | Licenses](#)
- [Management Console screen: Common | Health](#)

Management Console screen: Common | Services

This screen lets you start and stop any of the CMN component services: the Directory Connector, Mail Connector, Free/Busy Connector, or Quest Directory Sync Service.



NOTE: The **Start**, **Stop** and **Restart** commands issued from this screen are provided here as a convenience, and are *not* parts of any component configuration file. The command is executed immediately when you click the button, although if you have changed any of the configuration data, CMN will require that you **Save** your changes before it will execute a **Start** command.

The table lists all installed services by **Service Name**, and shows the **Status** of each: *Running* or *Stopped*. To immediately start, stop or restart a service:

- Select the service in the list, and click a button at the bottom of the screen: **Start Service**, **Stop Service**, or **Restart Service**.

Management Console screen: Common | Licenses

This screen lets you install or update a Quest license key to enable the CMN components. You can obtain a license key from your Quest Sales representative. A license key is an .asc-type file that Quest sends to you with an email. You must save the file to your hard disk, and then install it on this **Common | Licenses** screen.

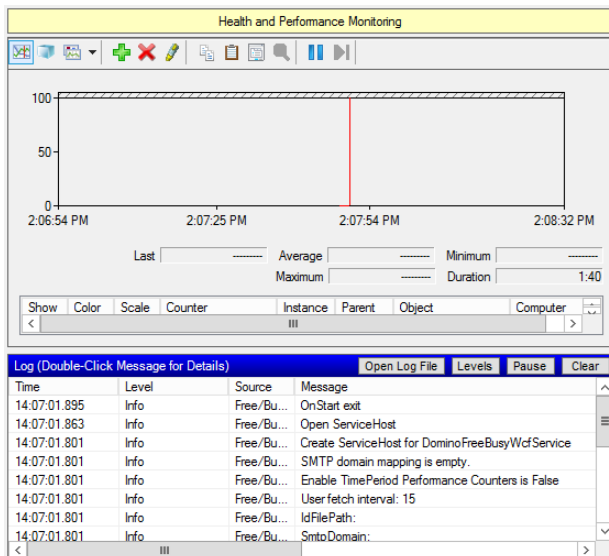
The table in this screen shows your previously installed licenses, the status of each, and the software and maintenance license expiration dates.

To install or update a Quest license key:

- 1 Click the **Update License...** button. The Management Console then presents a standard Windows *Open* dialog box.
- 2 Locate and specify the **License File**. Select the file so its name appears in the **File name** field, and then click **Open**.

Management Console screen: Common | Health

The *Health and Performance Monitoring* screen is divided into separate sections for performance monitoring and logs. The *Performance Monitoring* section shows performance counters in real time for the Mail Connector and Free/Busy components. Performance counters are color coded and can be turned on and off for various modules from this screen. Information about each performance counter is also displayed on the screen.



The *Log* section of this screen displays live log data broadcast via UDP from different modules. The most recent 1000 lines logged are displayed. Users can view specific logs by clicking the **Open Log File** button to view a list of log files that can be opened. In the *File* section of the screen, users can select a log file to open the log in the Quest Log File viewer. See the *Log Viewer* chapter of the *User Guide* for more information.



NOTE: The **Open Log File** button in this screen is enabled only when the *UdpAppender* is defined in the *log42net.config* file of at least one module. During a new installation, the Log Viewer installer installs a file with the required *UdpAppender*. During an upgrade, however, the installer does not overwrite the *log42net.config* file, so the *UdpAppender* is not present, and this makes the **Open Log File** button invisible. To correct this, see *To Add the UdpAppender to an Existing Log File* at the end of the *Configuring CMN Logging Appendix*.

CMN Performance Counters for Windows' System Monitor

CMN generates sets of performance counters for its Mail Connector and Free/Busy Connector that feed live data to Windows' System Monitor feature. To start Windows' System Monitor:

- 1 Click Windows' **Start** button, and then click **Run....**
- 2 In the *Run* dialog box: Type *perfmon* and click **OK**.

If you are unfamiliar with Windows' System Monitor, see your Microsoft documentation and/or visit the System Monitor online Help for more information. These procedures vary a little among different OS versions.

Within Windows' System Monitor, you can:

- Add CMN counters to the System Monitor view.
- Change graph scales, to view each type of CMN performance data at its optimum display scale.
- Configure System Monitor alerts for certain CMN performance criteria.

The available performance counters for CMN's Mail Connector and Free-Busy Connector are listed and defined in the introductory sections of those chapters (chapters 3 and 4) in this *User Guide*.

CMN Directory Connector

- [Directory Connector overview](#)
- [Installation and configuration](#)
- [DC Management Console](#)
- [Connector Creation Wizard](#)
- [Connector Advanced Settings](#)
- [Starting and stopping the Directory Connector service](#)

Directory Connector overview

The CMN Directory Connector (DC) updates directory information between the Domino Directory and Active Directory. Within the Directory Connector component, one or more individual *connectors* are defined, each to copy directory data in only one direction. A bidirectional update is accomplished by defining a pair of connectors to run sequentially in opposite directions.

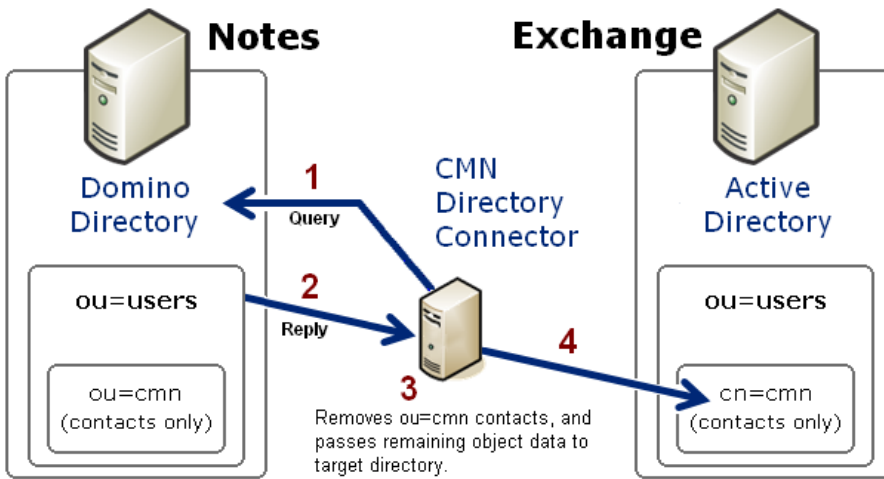


NOTE: CMN's Directory Connector does not support direct coexistence between Notes and a hosted Exchange environment (such as Office 365). You could, however, establish a "two-step" coexistence between Notes and a hosted AD:

- 1 Configure CMN's Directory Connector for bidirectional updates between Notes and a local, proprietary Active Directory, and then
- 2 Configure Microsoft's Online Services Directory Synchronization ("Quest Directory Sync Service") tool to synchronize the local AD with the hosted AD.

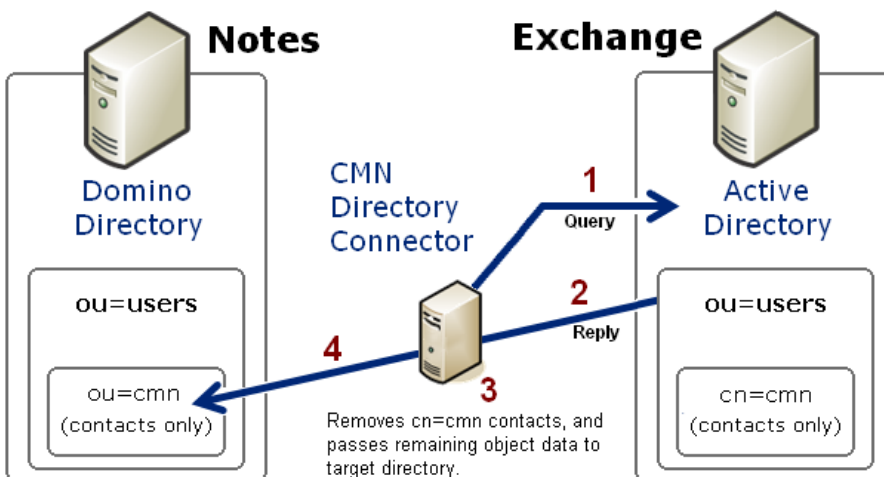
The combination of the two would configure an effective coexistence between Notes and a hosted AD.

Note that while *Directory Connector* is the name of the CMN component as a whole, the term *connector* also refers to the individual processes within the component, each defined to perform a particular directory update in a particular direction. For each defined connector, the CMN Directory Connector sends an LDAP query to the source directory (step 1 in this illustration), which then (2) replies by transmitting all of its object data back to the Directory Connector:



The Directory Connector then (3) filters (removes from the data) the objects that were in the source *ou=cmn* container. (The *ou=cmn* container is a reserved container created by the DC to hold contact objects copied from other connected directories. This filter eliminates the possibility of directory loops between connected systems.) CMN also maps the attributes of the remaining source objects to the corresponding contact attributes in the target.

Finally (4), the Directory Connector passes the data to the reserved *cn=cmn* container within the target directory. If a target container by that name does not already exist in AD, CMN will create it, within a target container that you specify. That is, the *cn=cmn* container will be a subset of the specified target container ("*ou=users*" in the above illustration). When a connector is defined to run from Exchange to Notes, the process works the same way in reverse, although the target CMN container in Domino is designated *ou=cmn* rather than *cn=cmn*:



Each query–reply process as illustrated above is defined within the CMN Directory Connector as one *connector*. Two connectors defined for opposite directions, and run sequentially, together facilitate a bidirectional update. If you have multiple servers within either or both systems, the DC lets you define as many additional connectors as you need to facilitate updates among them.

Individual DC connectors are configured to perform any number and combination of the Directory Connector's three primary operations:

- **Provision:** If no object in the target corresponds to an object in the source, the connector will create the new object in the target.
- **Update:** If an existing object in the target corresponds to an object in the source but the object's attribute data differs, the connector will overwrite target object data with corresponding source object data **—or—** will append source data to target data for some attribute(s) if so configured by the *<AppendAttributes>* parameter for the connector (as described in step 1 of the [Installation and configuration](#) instructions below).

- **Delete:** If the connector sees no object in the source that corresponds to an object in the target, it will delete the object in the target. For example, if User XYZ is copied from source to target, and then is deleted from the source, the next run of the same connector will remove User XYZ from the target.

A *Connector Creation Wizard* walks you through a short series of screens to configure each connector. Each connector is defined by specifying:

- the source and target directories;
- the object container in the source directory containing the objects whose data will be transmitted; and
- a container in the target directory to hold the CMN container, which in turn will hold the contacts copied from the source server.

A connector definition also specifies a schedule for its automatic execution, and lets you specify other DC connectors (previously defined) that must run prior to the execution of *this* connector. These features let you require a particular order of execution when two or more connectors are defined.

CMN's Directory Connector service is started manually, but thereafter it runs continuously. The Directory Connector service is idle most of the time except for periodic checks to determine whether a defined connector is scheduled to run. If so, the service verifies that any prerequisite connectors have already run, and launches the connector. When the connector is complete, the DC service returns to its dormant state, waiting for the next scheduled connector run.

Installation and configuration

The CMN Directory Connector is installed by the same AutoRun installer that installs all components of the Quest Coexistence Manager for Notes product. If you have already installed one or more other components, just run the AutoRun installer again to install the Directory Connector. The AutoRun installer must be run on the computer where you want the CMN component to reside.

Verify that every computer hosting any CMN Directory Connector subcomponent(s) meets the current *System Requirements* as specified in the most recent *RTM Release Notes*.

For complete installation instructions, see the *Getting Started* section of the *CMN Quick-Start Guide*.

Configuring the CMN Directory Connector

Follow these steps to configure the CMN Directory Connector:

- [Step 1: Devise a strategy for your directory updates](#)
- [Step 2: Configure LDAP to permit Domino read and write access for CMN's Directory Connector](#)
- [Step 3: Make the showInAddressBook attribute visible in GC](#)
- [Step 4: Run the DC Management Console and Connector Creation Wizard to create connector\(s\)](#)
- [Step 5 \(conditional\): Change communications port](#)
- [Step 6 \(conditional\): Preempt object collisions in environments with multiple source SMTP domains](#)
- [Step 7 \(recommended\): Configure LDAP to write to a secondary address book](#)
- [Step 8 \(if necessary\): Verify Exchange DL configuration](#)
- [Step 9 \(optional\): Configure CMN logging](#)

Step 1: Devise a strategy for your directory updates

CMN's Directory Connector lets you define as many connectors as you need to facilitate separate directory updates among multiple directory servers on either or both sides, and/or for different administrative entities in your organization, or for different geographic locations, etc. If two or more connectors are defined for the same direction, you must direct them to copy their data to different, separate target containers.

Individual DC connectors can be configured to perform any number and combination of three primary operations:

- **Provision:** If no object in the target corresponds to an object in the source, the connector will create the new object in the target.
- **Update:** If an existing object in the target corresponds to an object in the source but the object's attribute data differs, the connector will overwrite target object data with corresponding source object data **—or—** will append the source data to the target data for some attribute(s) if so configured by the `<AppendAttributes>` parameter for the connector (see [Configuring the <AppendAttributes> parameter](#) below).

Note that a manual change to an entry in a CMN target container will persist through subsequent connector runs if the corresponding source object record has not also been changed. A connector compares the source object data to a copy of the source object record from the preceding connector run, and updates the target object only if the source object has changed.

- **Delete:** If the connector sees no object in the source that corresponds to an object in the target, it will delete the object in the target. For example, if User XYZ is copied from source to target, and then is deleted from the source, the next run of the same connector will remove User XYZ from the target.

Think through your strategic options and decide now, before you define any connectors, how you want your directories to be updated. Decide in advance the number and scope of DC connectors you will need to accommodate your particular environment, circumstances and preferences, and the number and names of Domino target containers and AD target OUs you will need.

Configuring the `<AppendAttributes>` parameter

The `<AppendAttributes>` parameter lets you specify a list of one or more target attributes whose values will be appended to, rather than replaced by, a connector running in *Update* mode. That is, for each object in the directory, the value of each designated attribute in the source will be added to any existing value in the target.

This parameter is optional, and is configured separately for each DC connector in the connector's section of the *DC Configuration.xml* file. To designate the attribute(s) that should function this way in *Update* mode for a particular connector, find (or add) the `<AppendAttributes>` tags for the connector, and enter the names of the target attributes separated by a pipe character ("|") between the tags, like this:

```
<AppendAttributes>cn|mail|proxyaddresses</AppendAttributes>
```

Step 2: Configure LDAP to permit Domino read and write access for CMN's Directory Connector

CMN's Directory Connector requires LDAP read and write access to the Domino server to enable its connectors' queries and data transmissions. The account used to access Domino must have *Add* and *Delete* access to the *names.nsf* database on the Domino server.

To configure LDAP for CMN's Directory Connector:

- 1 In the Domino Administrator, on the *Configuration* tab: In the navigation tree at left, expand **Directory**, then expand **LDAP**, and then select **Settings**.

If you already have an LDAP configuration document, Domino Administrator will open it into the window at right. If you do **not**, Domino will prompt you to create one.

i **NOTE:** The LDAP configuration document you edit or create here will **not** replace your existing Domino configuration document. Domino will simply draw the new/updated LDAP configuration settings into your existing configuration.

- 2 In the LDAP configuration document: Click **Edit LDAP Settings**.
- 3 *If you will configure any Exchange-to-Notes connectors:* In the **LDAP Settings**, set **Allow LDAP users write access** to Yes. (This step is unnecessary if you will configure only Notes-to-Exchange connectors.)
- 4 *If configuring a coexistence with a Domino 6.5.x server (only):* You must also disable constraint checking on LDAP writes.
- 5 **Save & Close** the document, and then restart the Domino server.

LDAP writes to the Domino directory also require that the directory ACL have the **Maximum Internet name and password** set to *Editor*, and have all **Roles** selected (checkboxes marked). These settings act as a global filter that everything must check against.

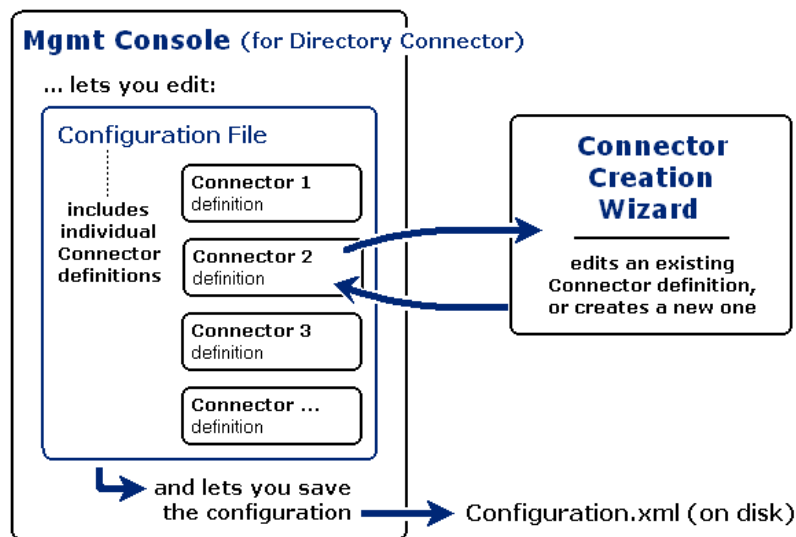
Step 3: Make the *showInAddressBook* attribute visible in GC

CMN requires replication of this attribute to the Global Catalog so that *ou=users* will appear in the source list of OUs in the Connector Creation Wizard (when creating an Exchange-to-Notes connector). The procedure:

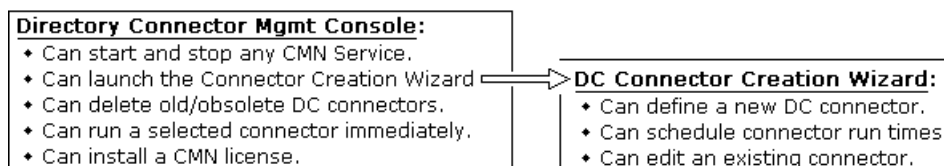
- 1 Open Microsoft's Active Directory Schema snap-in.
- 2 In the console tree, under **Active Directory Schema/Attributes**, click **Attributes**.
- 3 In the details pane: Right-click the *showInAddressBook* attribute, and select **Properties**.
- 4 Select the checkbox for: **Replicate this attribute to the Global Catalog**.

Step 4: Run the DC Management Console and Connector Creation Wizard to create connector(s)

Use CMN's Directory Connector Management Console and its Connector Creation Wizard to define and manage the connectors that will update the directories you want to keep current, and to schedule the connectors to run. The DC Management Console and Connector Creation Wizard perform different but related functions as shown in this illustration, and in the chart following:



The Connector Creation Wizard is run separately for each DC connector you want to create (or edit).



Two later sections of this chapter, [DC Management Console](#) and [Connector Creation Wizard](#), provide the operational details necessary to use these tools.

Note that this step alone does **not** start the Directory Connector service, and that the defined connectors will run only if the Directory Connector service is running. For more information, see [Starting and stopping the Directory Connector service](#) later in this chapter.

Step 5 (conditional): Change communications port

The Directory Connector needs to know which communications port to use for data transmissions between the DC service and the DC Management Console, on the server where these applications reside. The port number for this is set to 9081 by default, and this will be the correct setting in almost all environments.

But if port 9081 is assigned to some other service or function in your environment, you must change the communications port setting in the Directory Connector configuration file. To do this (if necessary):

- 1 Find and open the Directory Connector configuration file, in CMN's *\Directory Connector* folder (named *Configuration.xml* by default).

i **IMPORTANT:** The CMN Management Console must be closed before you open this configuration file. When you select **File|Save** in the Management Console, the Console saves all of its open data to the *Configuration.xml* file, and this will overwrite any manual changes to the file that may have been saved while the Console was open.

- 2 Find the `<ServicePort>####</ServicePort>` parameter, usually at or near the end of the `<DirectoryConnectorSettings>` section.

! **CAUTION:** Be very careful when manually entering or editing values in the *Configuration.xml* file, where incorrect syntax or even a single-character typo could disable a connector or the DC service altogether.

- 3 Change the value of the `<ServicePort>####</ServicePort>` parameter to the port number you want to designate as the CMN Directory Connector communications port.
- 4 Save and close the Directory Connector configuration file.

Step 6 (conditional): Preempt object collisions in environments with multiple source SMTP domains

Many organizations prefer to use alternate or subdomains to enable mail routing between systems during a coexistence period. In environments with multiple source SMTP domains, applying a constant subdomain to all users could result in collisions. The Directory Connector uses organizational units as the selection criteria for each connector's operation. Multiple SMTP domains within a single OU create a possibility of address collisions during the operation. In this case, additional configuration may be required to avoid duplicate addresses.

For many organizations the easiest solution is to create multiple connectors (one for each source SMTP domain) with separate subdomains for each, and then define object filters for the different connectors (see [Advanced Settings tab: object filtering features](#) later in this chapter). Use the object filters to have each connector pull users only from the specified SMTP domain. This will allow a different subdomain to be used for each source SMTP domain and eliminate any chance of address conflicts between domains.

Step 7 (recommended): Configure LDAP to write to a secondary address book

The Directory Connector can write to a secondary address book, if you use Notes Directory Assistance (DA) to direct LDAP writes to a selected address book. Many organizations prefer this approach to isolate the updates and eliminate direct updates to the production NAB. To configure Notes for this:

i **NOTE:** Newer versions of Domino have renamed the **File | Database | ...** menu path to **File | Application | ...**. If you are running one of these newer Domino versions, just substitute "**File | Application | ..**" for "**File | Database | ...**" wherever that menu path appears in this procedure.

- 1 Give the permission needed to create a Domino directory:
 - a Open the database *pubnames.ntf* (**File | Database | Open**) by selecting the server, then manually typing in the filename. (If the database does not already exist, create it: **File | Database | New**.)
 - b Edit the database's ACL: **File | Database | Access Control**.
 - c Select or add the user or group to which you want to give permission (e.g., *Local Domain Admins*).

- d Assign manager access, verify all roles are checked, and click **OK**.
 - e Close the database.
- 2 Create a new Domino directory:
 - a Create the new database: **File | Database | New**.
 - b Select the server in the *Database Name* section.
 - c Enter a name for the new database (e.g., *secondAB.nsf*).
 - d In *Advanced Templates*, check **Show All Templates**.
 - e Select the server in the *Template* section.
 - f Select **Domino Directory** as the template, and click **OK**.
 - g Assign a unique domain name (e.g. *secondAB*), then **Save & Close**.

Note: This domain name will be used in step 6b below.
- 3 Apply permission for the CMN Directory Connector user account and the Notes admin account:
 - a Edit the database's ACL: **File | Database | Access Control**.
 - b Select or add the user or group to which you want to give permission (e.g., *administrator* and *SyncUser*).
 - c Assign manager access, verify all roles are checked, and click **OK**.
- 4 Enable LDAP write access for that directory:
 - a In Domino Administrator, on the *Configuration* tab: In the navigation tree at left, expand **Directory**, then expand **LDAP**, and then select **Settings**.

If you already have an LDAP configuration document, Domino Administrator will open it into the window at right. If you do not already have an LDAP configuration document, it will prompt you to create one.
 - b In the LDAP configuration document: Click **Edit LDAP Settings**.
 - c In the **LDAP Settings**: Set **Allow LDAP users write access** to Yes.
 - d **Save & Close** the document.
 - e Restart the Domino server.
- 5 Create and configure the Directory Assistance database:
 - a Create the new Directory Assistance database: **File | Database | New**.
 - b Select the server in the *Database Name* section.
 - c Enter a name for the new DA database (e.g., *newDAdb.nsf*).
 - d Select the server in the *Template* section.
 - e Check **Advanced Templates** to show all templates.
 - f Select *Directory Assistance* as your template.
 - g Click **OK** and leave the new Directory Assistance database open.
- 6 Assign address books to Directory Assistance:
 - a From the Directory Assistance database, select **Add Directory Assistance**.
 - b In the *Basics* tab, enter the domain of the address book you want to add.

Note: The primary address book domain name must match the domain name of the address book, **and** the domain name of the secondary address book must match the domain name specified in step 2g (e.g., *secondAB*).
 - c Under the *Naming Rules* tab, enter a unique **Organization Name** for this address book, and leave all other fields for that line as "" (e.g., *secondary*).

Note: The **Organization Name** will appear in the Name Rules for the secondary address book *and* will be used in step 9 below to create a CMN Directory Connector connection.

- d Open the address book you want to link to the rule you just created.
- e Switch back to the **Add Directory Assistance** dialog box, and select the *Replicas* tab.
- f Drag and drop the top tab (marking the address book you want to link to this Directory Assistance rule) into the field marked **Database Links**. This should produce a blue book in the field. Then **Save & Close** the rule.

Repeat steps 1–6 to create a unique Directory Assistance document for *each* address book, including the primary address book.

When you have completed steps 1–6 for all address books, you should see one document for each address book in the new Directory Assistance Database (*newDAdb*). This includes the primary address book. For example:

primaryDomain	Notes	companyA	*/**/*/<primary>/*
secondary AB	Notes	companyX	*/**/*/<secondary>/*

... where *<primary>* and *<secondary>* are variables that should be filled with the actual primary and secondary organization names, respectively.

- i** **NOTE:** If you use an organization for the secondary address book, you must have a certifier for that organization or organizational unit. Usually you are asked for a "certificate" when you create it, but you can create it without one by only specifying the name and issuer. To create a certificate:
- 1 In Domino Administrator, on the *People & Groups* tab: Select the secondary address book from the navigation tree at left, and click **Certificates**.
 - 2 Select **Notes Certifiers** (in the pane at right), and click **Add Certifier**.
 - 3 Add two Certifier entries of *O=xxxxxxx* (or *OU=xxxxxxx* if configured at a higher level), where *xxxxxxx* is the string you added to the secondary address book configuration (in place of the *<secondary>* variable in the routing table, as shown above).
 - 4 Click **Save & Close**.

When you have completed steps 1–6 for all address books, continue this procedure with step 7:

- 7 Assign the Directory Assistance Database to the server:
 - a Open the primary address book (*names.nsf*).
 - b In the **Servers** part of the tree, open the document for your server.
 - c Under the **Directory Information**, enter the name of the Directory Assistance Database file from step 5c (*newDAdb.nsf*).
 - d **Save & Close** the primary address book.
- 8 Restart your Notes server:
 - a Close the Notes client.
 - b Type into the Notes console: *quit*
 - c Open the Notes server and login with the client.

- 9 CMN Directory Connector configurations:

If defining an Exchange-to-Notes connector, and you want the Contacts placed in the secondary address book, you must use the target OU string as defined above: *O=xxxxxxx* or *OU=xxxxxxx* (see the pushpin note preceding step 7 above).

Step 8 (if necessary): Verify Exchange DL configuration

Check the *Message Delivery Restrictions* settings for any Exchange group to which you want Notes users to be able to send messages. Any such Exchange group must be of the *universal distribution* type to be mail-enabled. To change the settings, beginning in the Exchange Management Console:

- 1 Select the group under **Recipient Configuration | Distribution Group**, then double-click the group you want to edit.
- 2 Click the *Mail Flow Settings* tab, and highlight **Message Delivery Restrictions**, then click **Properties** above.
- 3 De-select (unmark) the check box for **Require that all senders are authenticated**.
- 4 **Save**, and then restart the MS Exchange transport service.

Step 9 (optional): Configure CMN logging

CMN is installed with the *log4net* utility to generate log files of CMN components' system activity. This information is critical to diagnosing any configuration issues that may arise. Logging is enabled by default for all CMN components.

The default configurations will be suitable for most organizations and circumstances, but you can customize logging features. The *log4net* utility may be configured to work a particular way with each CMN component. Configuration instructions are nearly identical for all components, so we present the instructions separately, in *User Guide* Appendix C.

To synchronize dynamic distribution lists

CMN's Directory Connector lets you synchronize dynamic distribution lists between the source and target directories. This feature is enabled (or not) and configured independently per connector.

The following xml attributes can be used to overwrite the default values for the source or target object type used during synchronization:

SourceUserObject	TargetUserObject
SourceGroupObject	TargetGroupObject
SourceResourceObject	TargetResourceObject
SourceContactObject	TargetContactObject

To use one of the values listed above to change the default source or target object type:

- 1 Create a new connector that will be used to change the source or target object type. Save the new connector.
- 2 Stop the Configuration Console.
- 3 Edit the *Configuration.xml* file located in the Directory Connector directory.

Find the configuration (*<ConnectorSetting>*) section for the connector you intend to modify and add a line for the desired xml attribute as shown in the example below. The new line is shown here in **red italicized type**. In this example, the *SourceGroupObject* is used to modify the default value *Groups* to the value *msExchDynamicDistribList*:

```
<ConnectorSetting>
...
<TargetPort>389</TargetPort>
<TargetUseSsl>>false</TargetUseSsl>
<SourceOu>DC=mustang,DC=wingra,DC=com</SourceOu>
<TargetOu>OU=abcdefg,O=wingra</TargetOu>
<Groups>>true</Groups>
<Users>>false</Users>
<Contacts>>false</Contacts>
<SourceGroupObject>msExchDynamicDistribList</SourceGroupObject>
</ConnectorSetting>
</ConnectorSettingsList>
```

- 4 Restart the Configuration Console.

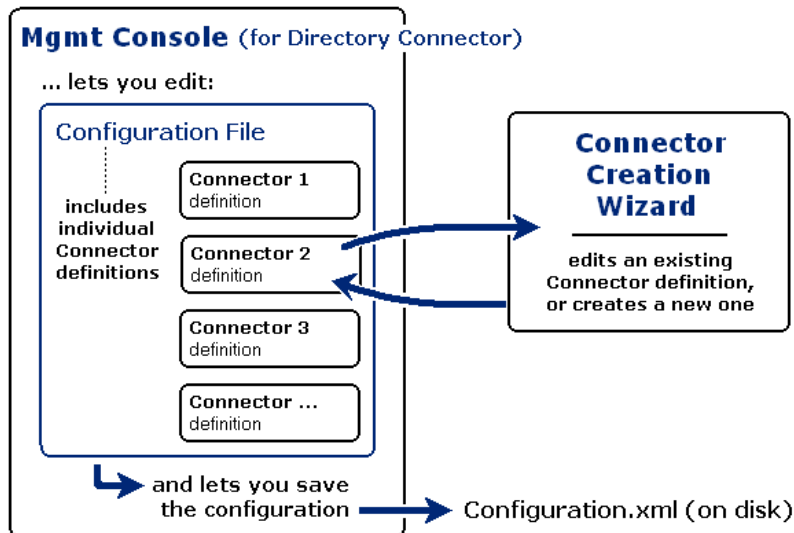
- 5 Save the modified configuration.
- 6 Run synchronization.

DC Management Console

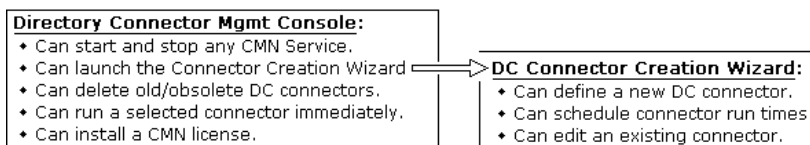
The CMN Directory Connector (DC) includes a configuration tool, called the *Management Console*, that directs the Directory Connector's features and functions according to entries in the Console application: source and target directories, access credentials, update scope, scheduled runs, and so forth. One of the Console's screens also lets you launch a *Connector Creation Wizard*— a separate application to create or modify the configuration details for individual DC *connectors* that will copy directory data from one environment to the other.

The configuration data for both the DC service as a whole and its individually defined connectors is saved in a configuration file named *Configuration.xml* (by default), in CMN's *\Directory Connector* folder. The DC configuration file may be opened, modified and saved as needed, by any XML editor, but CMN's Management Console provides a "friendlier" interface for managing configuration settings. The Console also makes DC configuration safer, since a single typo in the xml file (when hand-editing) can cause unintended consequences or even disable a connector altogether.

Note that the DC configuration file controls only the Directory Connector, *not* CMN's Mail Connector or Free/Busy Connector—which are controlled by their own, separate configuration files.



The relationships among the CMN Directory Connector Management Console, its Connector Creation Wizard, and the *Configuration.xml* file are illustrated in the diagram above and in this chart:



Chapter 1 of the *User Guide* explains the basic operating concepts for the CMN Management Console. This DC chapter provides the field notes for the Console screens that pertain to DC configuration, and for the Connector Creation Wizard.

DC Management Console screens

The Management Console contains this screen for the Directory Connector:

- **Directory Connector | Connector Settings:** Create, change or delete a connector definition, or run it immediately (rather than waiting for its next scheduled execution).

Directory Connector | Connector Settings

The *Connector Settings* screen shows a list of all defined *Connectors* for CMN's Directory Connector component—as defined in the currently open configuration file. (The table appears empty if no configuration file has been opened, or if no connector has yet been defined.)

From this screen you can launch the Connector Creation Wizard to create a new connector or edit an existing one, or open a dialog box of *Advanced Settings* for an existing connector definition.

The *Connectors* table lists connectors by name, and shows the *Direction*, *Source* and *Target* Servers, and the *Last Started* and *Last Completed* times for each.

To create a new connector and add it to the displayed *Connectors* table:

- Click the **Add** button (to start the Connector Creation Wizard), and complete the Wizard. See [Connector Creation Wizard](#) below for screen-by-screen field notes.

To change the definition and/or execution schedule of an existing connector:

- Select the connector you want to change, and click the **Edit** button (to start the Connector Creation Wizard in its *Edit* mode). See [Connector Creation Wizard](#) below for screen-by-screen field notes.

To delete a connector definition (and remove it from the *Connectors* table):

- Select the connector you want to delete, and click **Remove**.

i

NOTE: The Management Console creates a folder for each defined connector (under ...*Directory Connector\Connections*) to hold connector information that the DC service reads when the connector runs. The **Remove** feature does **not** remove this corresponding connector folder, so you may want to delete it manually.

A removed connector no longer appears in the table, and its information has been deleted from the *configuration.xml* file. Over time the ...*Connections* folder may become cluttered if you do not manually delete connector subfolders when their Connectors are removed in the Management Console, but an undeleted folder is otherwise harmless.

To run a connector immediately (rather than waiting for its next scheduled run):

- 1 Select the connector you want to run (in the *Connectors* table).
- 2 If required, select the check boxes for these optional features:
 - **Optional:** Click the **Update all objects** check box to expand the scope of the update to include all objects in the source. The connector always compares detected source objects to their corresponding objects in the target and identifies any target object that does not match the detected source object.
 - If **Update all objects** is unchecked, the connector can only detect source objects with a time stamp that is later than the connector's last running time and update them.
 - If **Update all objects** is checked, the connector detects all of the source objects and updates the target.
This can be called as an incremental synchronization and the delete action is not executed in an incremental synchronization unless the **Update all objects** is enabled.
 - **Optional:** Click the **Do not commit changes** checkbox if you want to run a “dry run” of the connector, in which the potential outcome is documented in the log file, but nothing is committed to the tar-

get. This feature lets you examine a connector's outcome and perhaps fine-tune its configuration before applying it to actual data.

i **NOTE:** The **Update all objects** and **Do not commit changes** check boxes are unchecked by default. You must re-enable these settings every time you reopen the CMN Management Console.

3 Click **Run Connector Now**.

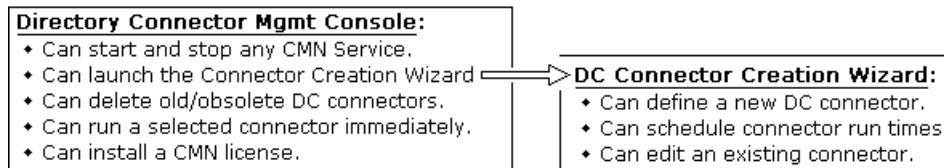
Advanced Settings

The *Connectors* table also provides access to a dialog box of *Advanced Settings* that can be applied to existing connector definitions (one connector at a time). These *Advanced Settings* control several connector functions whose default configurations are suitable in most environments, but may be modified for local circumstances.

See [Connector Advanced Settings](#) later in this chapter to see whether any of the features in the tabbed panels of the *Advanced Settings* dialog box might be necessary or useful in your local environment.

Connector Creation Wizard

The Connector Creation Wizard lets you configure a connector within a series of helpful GUI screens. As noted above, the DC Management Console and Connector Creation Wizard perform different but related functions:



The Connector Creation Wizard is run separately for each DC connector you want to define (or edit).

i **IMPORTANT: Remember** that the Connector Creation Wizard doesn't save connector definitions to disk. Connector definitions are contained within the DC's *Configuration.xml* file, so a connector definition is saved only when you save *Configuration.xml* from the CMN Management Console. You must select **File | Save Configuration File** from the Console if you want to save any new connectors you have defined, or save any changes you have made to existing connectors.

Starting the Connector Creation Wizard

To start the Connector Creation Wizard **to create a new connector** (from within the DC Management Console, on the *Connector Settings* screen):

- Click **Add**.

To start the Connector Creation Wizard **to edit an existing connector**:

- Select the connector you want to edit, and click **Edit**.

The Wizard presents the same screens, in the same order, in both the *Add* and *Edit* modes. The only difference is that the *Edit* mode shows the fields already filled with the previously entered values for the selected connector.

To abort a run of the Connector Creation Wizard, and discard any data you may have already entered or edited:

- Click the **Cancel** button from any screen in the Wizard.

The Connector Creation Wizard presents a short series of screens to collect the information it needs to define and schedule a single connector.

Screens for an Exchange-to-Notes ("E-to-N") connector

This series of screens appears in the Connector Creation Wizard when you select the *Exchange-to-Notes Direction* in the *Connector Information* screen (first screen in the series, as noted below).

E-to-N: Connector Information

This first screen asks you to name the connector and specify the direction:

- **Connector Name:** The name of the connector, as you want it to appear in the table on the *Connector Settings* screen. Note that the connector name cannot include any characters that are disallowed for a Windows file or folder name, such as \ / : * ? " < > |
- **Direction:** Select the *Exchange to Notes* option to designate the direction of this connector's update (as [source] to [target]).

Click **Next** to proceed to the next screen.

E-to-N: Source Server Information

Enter this identifying information and access credentials for the source server:

- **Domain:** Name of the source (Active Directory) domain, in a form sufficiently qualified that it can be identified from the CMN Directory Connector server. For example: *jones.domain1.com*
- **Domain Controller / Domain / Forest** (radio buttons): A set of three radio buttons (to the right of the **Domain** field) to characterize the data source for this connector.
 - **Domain Controller:** CMN DC queries the specified DC for existing users.
 - **Domain:** CMN DC queries one DC in the Domain specified for existing users. Ensure the CMN DC is added into one of the domains within the forest containing the specified domain.
 - **Forest:** CMN DC queries one DC of the root domain specified for existing users throughout the whole Forest. Ensure the CMN DC is added in one of the Domains within the Forest specified. You must ensure that the Domain name in the **Domain** field is the root domain name of the Forest.
- **Username:** Username by whose authority the Directory Connector will access the source server.
 - ! **NOTE:** Access may fail in some environments even if you enter the correct credentials, since the **Username** can be expressed differently in different contexts. To solve this problem, see [Domino or Exchange server denies access to Directory Connector account](#), in the *Troubleshooting* Appendix.
- **Password:** Password associated with the **Username** above.
- **Port:** Port number that the source server will use to communicate with CMN's Directory Connector. Leave this value set to its default unless there is some particular reason to designate some other port.

When these fields are filled as you want them, click **Next** (or you can click **Back** to revisit the preceding screen in the sequence).

E-to-N: Source Object Selection

The fields on this screen specify the objects in the source server to be processed.

- Mark one or more checkboxes to indicate the types of objects you want to process:
Resources Groups Users Contacts
- **Domain:** Name of the source (AD) domain. CMN prefills this field with the value entered for **Domain** on the *Source Server Information* screen.

- **Source OU:** In the adjacent container subtree display box, select one or more checkboxes corresponding to the OU(s) containing the objects this connector will copy to the target directory. Note that each container must be explicitly selected to be included with this connector's source OUs. Selecting a higher-level OU includes all of its lower-level OUs. Be sure to select the most *inclusive* OU(s).



NOTE: For an Exchange-to-Notes connector: The name of the source container for an Exchange-to-Notes connector cannot begin with the letters *CMN*. If the source container name begins with *CMN* the connector will generate an *Empty Recipient List* error.

- **OUs To Exclude:** Enter the path of a Source OUs container that you want to exclude. This field is optional. Separate the paths of multiple source OUs to exclude with a pipe character ("|"). For example:

OU=Contoso,O=Cubasic|OU=Quest,O=Cubasic.

When these fields are filled with the correct information, click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

E-to-N: Target Server Information

Enter this identifying information and access credentials for the target server:

- **Target Server:** Enter the name of the target server, in a form sufficiently qualified that it can be identified from the CMN Directory Connector server. For example: *smith.domain2.com*
- **Username:** The username by whose authority the Directory Connector will access the target server. This must be a domain administrator account with sufficient rights/permissions to access the target server.



NOTE: Access may fail in some environments even if you enter the correct credentials, since the **Username** can be expressed differently in different contexts. To solve this problem, see [Domino or Exchange server denies access to Directory Connector account](#), in the *Troubleshooting Appendix*.

- **Password:** Enter the password associated with the **Username** above.
- **Port:** Enter the port number that the target server will use to communicate with CMN's Directory Connector. Quest recommends you leave this value set to its default, unless there is some particular circumstance that requires designating some other port.

When these fields are filled with the correct information, click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

E-to-N: Target Location Information

The information on this screen identifies data destination(s) in the target server:

- **Target Server:** Name of the server. CMN prefills this field with the value you entered for it on the *Target Server Information* screen.
- **Target OU:** Drop-down list to specify the container in the target directory that should contain the CMN target container—into which this connector will copy objects from the source. (CMN names its target container *ou=cmn* in a Domino Directory. CMN will create the target container if it doesn't already exist, in the **Target OU** specified here.)
- ☐ **Notes Internal Routing Domain** (only if you will use subdomains for mail routing): Mark this checkbox and enter the target's subdomain name (for example, *domino.sitraka.com*) into the associated text box. This is the subdomain portion of the addresses (after the @ symbol) that will route mail from the target environment back to the source.
- **Notes Calendar domain (Optional):** Enter the name of the target Calendar domain.
- **Notes Domain** (only if you want contact addresses to be formed with *@notesdomain* appended to the contact SMTP addresses): The name of the target Notes domain (without the @ symbol, which CMN will insert). For example, enter *notesdomain* if you want the contact address to take the form *name@mydomain.com@notesdomain*. If this field is left blank, no **Notes Domain** will be appended to contact SMTP addresses.

i **NOTE:** The values you enter for **Notes Calendar domain**, **Notes Domain** and **Server Running QCalCon** are merged with the AD source data that is pushed into Notes. There are no comparable fields for this data in Active Directory. If you later change the value of any of these fields, it will appear that the source data has changed, although nothing has actually changed in AD.

- **Server running QCalCon** (only when the Free/Busy Connector is also running): Enter the name of the Domino server that hosts the QCalCon server task for CMN's Free/Busy Connector. The entry here (if any) must be sufficiently qualified that the server can be identified from the computer hosting CMN's Directory Connector service (e.g., *server/domain*).

When these fields are filled with the correct information, click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

E-to-N: Connector Order Management

This screen provides a table of all previously defined connectors, with a checkbox corresponding to each connector in the list. Mark the checkbox for each connector that must complete its run before the current connector will be permitted to start. Then click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

E-to-N: Connector Scheduling

This screen lets you schedule this connector's runs in much the same way that you define a recurring meeting in Notes or Exchange. You can define more than one recurrence pattern for any single connector, and if you do the scheduled runs will be the sum of all such recurrence patterns defined here. That is, if more than one recurrence pattern appears in the table (bottom half of this screen), the connector will run for *all* of the scheduled patterns that appear in the table.

To add a recurrence pattern to the table:

- 1 Use the fields in the top half of the screen to define the recurrence pattern, as you would for a recurring meeting in Notes or Exchange.
- 2 If you want to update all objects in every scheduling run, check the **Update all objects** check box.
- 3 Click the **Add** button.

To remove a recurrence pattern from the table:

- Select it in the table, and click the **Delete** button.

To change some element of a previously defined recurrence pattern:

- Simply **Delete** it from the table, and then **Add** a new recurrence pattern to replace it.

Note that it is possible to define a connector *without* scheduling it for automatic recurring runs. Some admins, for example, like to have one or more unscheduled connectors defined that can be run as-needed, by the **Run Connector Now** feature in the DC Management Console.

When the table appears as you want it, click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

The Connector Creation Wizard presents a short series of screens to collect the information it needs to define and schedule a single connector.

i **NOTE: Remember that the** Connector Creation Wizard doesn't save connector definitions to disk. Connector definitions are contained within the DC's *Configuration.xml* file, so a connector definition is saved only when you save *Configuration.xml* from the CMN Management Console. You must select **File | Save Configuration File** from the Console if you want to save any new connectors you have defined, or save any changes you have made to existing connectors.

Screens for a Notes-to-Exchange ("N-to-E") connector

This series of screens appears in the Connector Creation Wizard when you select the *Notes-to-Exchange Direction* in the *Connector Information* screen (first screen in the series, as noted below).

N-to-E: Connector Information

This first screen asks you to name the connector and specify the direction:

- **Connector Name:** The name of the connector, as you want it to appear in the table on the *Connector Settings* screen. Note that the connector name cannot include any characters that are disallowed for a Windows file or folder name, such as \ / : * ? " < > |
- **Direction:** Select the *Notes to Exchange* option to designate the direction of this connector's update (as [source] to [target]).

When you have entered the requested information, click **Next** to proceed to the next screen.

N-to-E: Source Server Information

Enter this identifying information and access credentials for the source server:

- **Domain:** The name of the source domain, in a form sufficiently qualified that it can be identified from the CMN Directory Connector server. For example: *jones.domain1.com*
- **Username:** The username by whose authority the Directory Connector will access the source server.
 - **NOTE:** Access may fail in some environments even if you enter the correct credentials, since the **Username** can be expressed differently in different contexts. To solve this problem, see [Domino or Exchange server denies access to Directory Connector account](#), in the *Troubleshooting Appendix*.
- **Password:** The password associated with the **Username** above.
- **Port:** Enter the port number that the source server will use to communicate with CMN's Directory Connector. Quest recommends you leave this value set to its default, unless there is some particular circumstance that requires designating some other port.

When these fields are filled as you want them, click **Next** (or you can click **Back** to revisit the preceding screen in the sequence).

N-to-E: Source Object Selection

Use the fields on this screen to specify the objects in the source server to be processed.

- Mark one or more checkboxes to indicate the types of objects you want to process. For a connector defined to run from Exchange to Notes, you can select any number and combination of these options:
☐ Resources ☐ Groups ☐ Users ☐ Contacts
- **Domain:** The name of the source domain. CMN prefills this field with the value you entered for **Domain** on the *Source Server Information* screen.
- **Source OU:** In the adjacent container subtree display box, select the OU(s) that you want to be the root(s) of the subtree(s) containing the objects this connector will copy to the target directory. (You can select one or more OUs.) The connector will take the objects in the selected container(s) and all sub-containers in the subtree(s). Be sure to select the most *inclusive* OU(s).
- **OUs To Exclude:** Enter the path of a Source OUs container that you want to exclude. This field is optional. Separate the paths of multiple source OUs to exclude with a pipe character ("|"). For example:
OU=Contoso,O=Cubasic|OU=Quest,O=Cubasic.

When these fields are filled with the correct information, click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

N-to-E: Target Domain Information

Enter this identifying information and access credentials for the target server:

- **Target Domain:** Enter the name of the target Active Directory domain, in a form sufficiently qualified that it can be identified from the CMN Directory Connector server. For example: *smith.domain2.com*
- **Domain Controller / Domain / Forest** (radio buttons): A set of three radio buttons (to the right of the **Domain** field) to characterize the target for this connector. Select the **Forest** option if you want to be able to select (in the next screen) a **Target OU** from among multiple domains in a target AD forest.
 - **Domain Controller:** CMN DC queries the specified DC for existing users.
 - **Domain:** CMN DC queries one DC in the Domain specified for existing users. Ensure the CMN DC is added into one of the domains within the forest containing the specified domain.
 - **Forest:** CMN DC queries one DC of the root domain specified for existing users throughout the whole Forest. Ensure the CMN DC is added in one of the Domains within the Forest specified. You must ensure that the Domain name in the **Domain** field is the root domain name of the Forest.
- **Username:** The username by whose authority the Directory Connector will access the target server. This must be a domain administrator account with sufficient rights/permissions to access the target server.

i | **NOTE:** Access may fail in some environments even if you enter the correct credentials, since the **Username** can be expressed differently in different contexts. To solve this problem, see [Domino or Exchange server denies access to Directory Connector account](#), in the *Troubleshooting Appendix*.

- **Password:** Enter the password associated with the **Username** above.
- **Port:** Enter the port number that the target server will use to communicate with CMN's Directory Connector. Quest recommends you leave this value set to its default, unless there is some particular circumstance that requires designating some other port.

When these fields are filled with the correct information, click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

N-to-E: Target Location Information

The information on this screen identifies data destination(s) in the target server:

- **Target Domain:** The name of the Active Directory server. CMN prefills this field with the same value you entered for it on the *Target Server Information* screen.
- **Target OU:** Use the drop-down list to specify the container in the target directory that you want to contain the CMN target container— into which this connector will copy objects from the source directory. (CMN names its target container *cn=cmn* when the target is in Active Directory. CMN will create these target containers if they don't already exist, in the **Target OU** specified here.)
- **Target Search Base Dn:** Defines the scope of the connector's searches for target objects. Clicking in this field opens a pop-up list of available target base DNs, with checkboxes, so you can select one or more. If you want to include users in the sync process, to check for existing objects in multiple target domains, each target base DN must be explicitly selected to be included in the comparisons. Selecting a higher-level OU includes all of its lower-level OUs. This feature lets you improve search performance by excluding OUs that do not contain any objects relevant to these searches. *The OUs selected here **must** include the **Target OU** specified in the preceding field on this screen.*
- **[] Exchange Internal Routing Domain** (only if you will use subdomains for mail routing): Mark this checkbox and enter the target's subdomain name (for example, *exchg.sitraka.com*) into the associated text box. This is the subdomain portion of the addresses (after the @ symbol) that will route mail from the target environment back to the source.

- **[] Exclude Legacy Exchange Dn and Address Book Roots from connector mapping:** Mark this checkbox if you want the connector to disregard the **Legacy Exchange Dn**, **Address Books Container Base Dn** and **Global Address List Dn** fields when mapping source fields to target fields. Typically marked for an Office 365 target.
- **Legacy Exchange Dn:** Base Dn for the Legacy Exchange Dn (_____/CN=Recipients/CN=[UserValue]). Use the **Load from AD** button (see below) or type the value into the text box.
- **Load from AD** button: Tells CMN to search Active Directory for these values, show them to you (in a pop-up dialog box), and then let you choose which value(s) you want to insert into the *Target Location Information* screen. To use this feature: Click **Load from AD**, review the values as CMN finds them in AD, mark the checkbox of each value you want to insert into *Target Location Information*, and then click **OK**.
- **Address Books Container Base Dn:** Base Dn for the Address Books Container Dn. Use the **Load from AD** button (see above) or type the value into the text box.
- **Global Address List Dn:** Base Dn for the Global Address List Dn. Use the **Load from AD** button (see below) or type the value into the box.

Click **Next** to advance to the next screen (or **Back** to revisit an earlier screen).

N-to-E: Connector Order Management

This screen provides a table of all previously defined connectors, with a checkbox corresponding to each connector in the list. Mark the checkbox for each connector that must complete its run before the current connector will be permitted to start. Then click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

N-to-E: Connector Scheduling

This screen lets you schedule this connector's runs in much the same way that you define a recurring meeting in Notes or Exchange. You can define more than one recurrence pattern for any single connector, and if you do the scheduled runs will be the sum of all such recurrence patterns defined here. That is, if more than one recurrence pattern appears in the table (bottom half of this screen), the connector will run for *all* of the scheduled patterns that appear in the table.

To add a recurrence pattern to the table:

- 1 Use the fields in the top half of the screen to define the recurrence pattern, as you would for a recurring meeting in Notes or Exchange.
- 2 Click the **Add** button.

To remove a recurrence pattern from the table:

- Select it in the table, and click the **Delete** button.

To change some element of a previously defined recurrence pattern:

- Simply **Delete** it from the table, and then **Add** a new recurrence pattern to replace it.

Note that it is possible to define a connector *without* scheduling it for automatic recurring runs. Some admins, for example, like to have one or more unscheduled connectors defined that can be run as-needed, by the **Run Connector Now** feature in the DC Management Console.

When the table appears as you want it, click **Next** to advance to the next screen (or click **Back** to revisit an earlier screen in the sequence).

The Connector Creation Wizard presents a short series of screens to collect the information it needs to define and schedule a single connector.



NOTE: Remember that the Connector Creation Wizard doesn't save connector definitions to disk. Connector definitions are contained within the DC's *Configuration.xml* file, so a connector definition is saved only when you save *Configuration.xml* from the CMN Management Console. You must select **File | Save Configuration File** from the Console if you want to save any new connectors you have defined, or save any changes you have made to existing connectors.

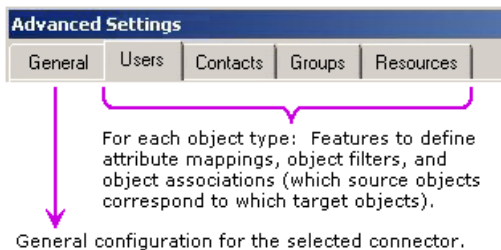
Connector Advanced Settings

Most of a connector's configuration settings are entered and edited in the [Connector Creation Wizard](#), as described in the preceding section, but a few other settings can be entered in a separate *Advanced Settings* dialog box. CMN's Directory Connector lets you fine-tune the attribute mappings, object-selection filters, and attribute associations (for source-target object matching), individually for each defined connector.

Typically these *Advanced Settings* control connector functions whose default settings are suitable for most environments, but may be modified as needed for your own local circumstances.

For any selected connector, the *Advanced Settings* let you modify the connector configuration for these features and functions:

- Edit the search string used with the Exchange exclusion attribute to prevent looping of objects during a directory update (if your expected use of the attribute would collide with the default settings).
- Enable or disable the *Provision* (add), *Update* (edit) and/or *Delete* functions of the designated connector.
- Set limits on the number of objects that can be deleted or added during a single directory update.
- For each object type (*Users*, *Contacts*, *Groups* and *Resources*):
 - *Attribute Mapping Features*: Define how directory attributes in the source correspond to attributes in the target.
 - *Object Filtering Features*: Define object selection filters that tell a connector which objects to include when provisioning, updating or deleting objects.
 - *Object Association Features*: Define how a connector matches objects in the source directory to their corresponding objects in the target.



The *Advanced Settings* dialog box can contain any number and combination of five tabbed panels (all five shown here), depending on which objects you have selected for processing by this connector.

The *Advanced Settings* dialog box is launched from the *Connectors* table in the *Connector Settings* screen of the Management Console. From that *Connectors* table: Right-click on the connector whose *Advanced Settings* you want to edit, and click **Advanced Settings** to open the dialog box.

Viewing Directory Connector Advanced Settings

Unlike other Directory Connector settings which are stored in the *configuration.xml* file, the Advanced Settings are stored in the Redis database. Current Advanced Settings can be viewed through the Redis client.

Installing the Redis Client for Kohler

To view the Advanced Settings, you must download and install the Redis Client for Kohler. You can download the software from the Quest support site at <https://support.software.quest.com/coexistence-manager-for-notes/kb/208214>.

The download also contains instructional information on viewing the Advanced settings in the client.

Advanced Settings tab: General

The *General* tab lets you modify any or all of these connector configuration functions, as necessary:

- **Exclusion Mapping Value:** The search string used with the Exchange exclusion attribute to prevent looping of objects during a directory update — if your expected actual use of the attribute would collide with the default setting. The default string appears here, but can be changed if it collides with other uses of the attribute.
- **Enable Add/Delete Verification** for a Notes-to-Exchange connector: Use these two check boxes to trap probable error conditions that might otherwise cause inadvertent object additions or deletions during a directory update.

i **NOTE:** For example, sometimes the source system does not return all objects on a query, and these "missing" objects are then presumed to have been deleted from Domino. In that case, an N-to-E connector in **Delete** mode would delete those objects from Active Directory, trying to match the apparent state of the Domino source. But such inadvertent deletions can be avoided by setting a limit on the number of objects that may be deleted. This feature assumes that if the limit number is reached, an error has likely occurred, so the connector will abort the process and delete objects until the limit number is reached. **Add Verification** works similarly for object additions in a target directory.

- **Enable Add/Delete Verification** for a DC connector: Use these two check boxes and the associated text boxes let you set add and/or delete limits for a DC connector.
 - **Enable Add Verification:** Mark this box to set a limit on the number of objects that can be added to AD during a directory update. If the number to be added exceeds this threshold, the add operation is canceled and the update is aborted. Default = 2 billion.
 - **Enable Delete Verification:** Mark this box to set a limit on the number of objects that can be deleted from AD during a directory update. If the number to be deleted exceeds this threshold, the delete operation is canceled and the update is aborted. Default = 25.
 - **Worker Threads:** Before the Directory Connector can sync objects, the object must be processed. Multiple threads can be used to speed up the processing progress when there is a large number of objects. The default value is 1.
 - **Writer Threads:** After processing, the objects are synced to the target. Multiple writer threads can be used to speed up the writing progress. The default value is 1.
- **Provision — Update — Delete:** These three checkboxes let you enable or disable the *Provision* (add), *Update* (edit), and/or *Delete* objects functions for the selected connector. These functions are enabled and disabled independently for each connector:
 - **Provision:** If enabled [X], and no object in the target corresponds to an object in the source, the connector will create the new object in the target.
 - **Update:** If enabled [X], and an existing object in the target corresponds to an object in the source but the object's attribute data differs, the connector will overwrite target object data with corresponding source object data —or— will append source data to target data for some attribute(s) if so configured by the *<AppendAttributes>* parameter for the connector (as described in step 1 of the [Installation and configuration](#) instructions above).

i **IMPORTANT:** If you are upgrading from an earlier version connector and attempting to update Users as well as Contacts: You must also remove the filter condition that excludes user objects from the *Update* function. See the instructions below on the *Update Filters* tab of *Advanced Settings*.

Note that a manual change to an entry in a CMN target container will persist through subsequent connector runs if the corresponding source object record has not also been changed. A connector compares the source object data to a copy of the source object record from the preceding connector run, and updates the target object only if the source object has changed.

If the *Update* function is selected for this connector, these two checkboxes are also enabled:

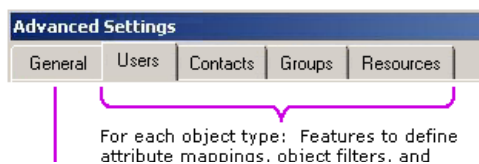
- **Update Target Object:** Determines whether the connector will update target objects with any changes in their corresponding source objects, for target object types other than contacts (users or resources or groups).
- **Overwrite Object Names:** Determines whether the connector will overwrite object names on corresponding objects discovered in the target. By default, object names are not overwritten (the checkbox is unmarked).
- **Delete:** If enabled [X], and the connector sees no object in the source that corresponds to an object in the target, it will delete the object in the target. For example, if User XYZ is copied from source to target, and then is deleted from the source, the next run of the same connector will remove User XYZ from the target.
- **Stop processing object when duplicates found:** When checked, if CMN finds duplicate target objects mapped to one source object, the duplicate target object is skipped.
- **Use first object found (otherwise last object found):** When checked, if CMN finds duplicate target objects mapped to one source object, the first object found is used as the target.
- **Exit when error occurs during search target objects:** When unchecked, CMN skips objects with an error and continues with the sync of remaining objects. When checked, if an error occurs, CMN exits the search process.
- **Do not check Source OU:** When checked, CMN uses the OU path as OU container directly or, CMN will look up the real OU container with the path.
- **Search OneLevel (default ldap search scope is Subtree):** When checked, CMN searches the immediate child objects of the source OU or, CMN searches the objects and all descendants of the source OU.

i NOTE: To display the **Do not check Source OU** and **Search OneLevel (default ldap search scope is Subtree)** fields, you must enable the `ShowMoreCheckBoxInAdvancedSetting` in the related connector setting of the Directory Connector configuration file (`Configuration.xml`).

Advanced Settings tabs for object types

The other four tabs in the *Advanced Settings* dialog box (other than the **General** tab) let you modify the attribute mappings, object-selection filters, and object-match associations for managing each of the four directory object types: **Users**, **Contacts**, **Groups** and **Resources**. The four tabbed panels all look the same and work the same, but the information they contain is applied to the different object types separately.

Each object-type tab in turn presents several "sub-tabs" for various features:



For each object type, the sub-tabs offer features that let you define:

- **Name Rules:** Define how newly created directory objects will be named.
- **Provision or Update Attribute Mapping:** Define how attributes in the source directory should correspond to attributes in the target directory when the connector is provisioning (adding new) or updating (editing) objects in the target.
- **Provision or Update or Delete Object Filters:** Define filters (conditions) to specify which source objects to include when this connector updates the target directory.
- **Association:** Define how the Directory Connector will determine which objects in the source correspond to the same objects in the target — typically by comparing the values of a particular attribute in the source with the values of a particular attribute in the target.

- **Source Attributes** or **Target Attributes**: Add additional attributes for source and target objects.

These categories of features are described separately below.

Advanced Settings tab: Name Rules

Directory objects in both Domino and Active Directory are saved as database records. Each object record contains an assortment of data elements—what we call "attributes" or "fields"—for things such as first name, last name, title, department, office, phone number, email address and so forth.

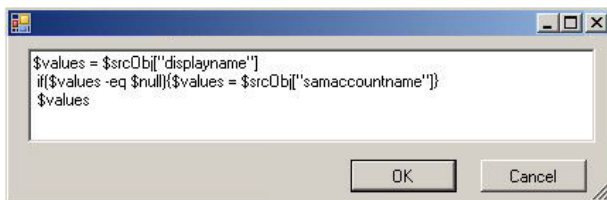
Every directory object must be distinguishable from all other objects in the same directory. To accomplish this, a particular directory attribute is designated as the "key" field, and the per-object values for the key field must be unique for every object in the directory. When a new object is created, the value of its key field is assigned by some method or "rule" that must ensure the value is unique within the directory.

The *Name Rules* tab of a Directory Connector's *Advanced Settings* specifies how new objects provisioned into the target directory will be named—i.e., how the unique values of their key fields will be composed, assembled or otherwise derived. The *Name Rules* tab displays a table, where each table row represents one method the connector may use to compose and assign a unique name (key field value) to the object.

Two or more methods may be defined in the table, to provide alternate methods in case the method(s) already tried do not yield a unique value. That is, if the first (top) method in the list yields a value that is not unique, the connector then applies the next method in the list to try to assign a unique name to the object. This process repeats as the connector works its way through the list from top to bottom, until either a unique value is composed and assigned, or the last method in the list fails to produce a unique value. If no method in the list produces a unique value, the connector notes in the log that it is unable to create an object, and skips to the next object to be provisioned.

Three buttons below the table let you define new object-naming methods (to add to the list) or edit existing methods in any of three ways:

- **Add Script**: Define a script to determine the values to assign to the object's key field. (See the sample script in this screenshot.)



Note that a script can be used to assign different values *conditionally* (per object), whereas a *rule* (next option below) cannot. A script can test environmental conditions (per object), as shown above, and then assign different values depending on the outcome of the test.

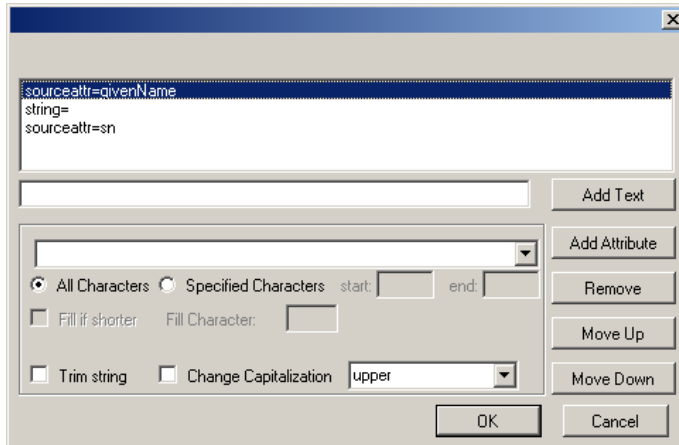
Click **OK** to add the script to the *Name Rules* table of methods and dismiss this *Add Script* dialog box.

- **Add Rule**: Define a rule to determine how object names will be composed, assembled or otherwise derived. A DC connector evaluates such a *rule* as an expression, and for each object assigns the result to the object's key field.

A *rule* assembles an assignment value for each object from any number, combination and sequence of source attribute values and text string constants, which in turn may be processed or derived by:

- Keeping only a specified portion of the string (defined by the starting and ending character positions), and discarding the rest.
- Appending a string of "fill" characters to fill the capacity of the attribute field (character may be a space or any other specified character).
- Trimming a string of repetitive "fill" characters (e.g., spaces) that follow an attribute value.
- Setting a capitalization preference for alphabetic characters in the value.

Click **OK** to add the rule to the *Name Rules* table of methods and dismiss this *Add Rule* dialog box.



- **Add Attribute:** Select an attribute from the drop-down list box, whose value (per object) will be assigned to the object's key field. Use the drop-down list to specify the attribute, and click **OK**.

After you have defined a method (when it appears in the table), you can move its position in the list, copy it, edit its definition, or delete it altogether:

- **Move Up:** Move the selected method up one position in the list.
- **Copy:** Make a copy of the selected method, and then **Edit** the copy via the **Edit** button.
- **Edit:** Edit the definition of a selected method. (In the table: Select the method you want to edit, and click **Edit**.)
- **Remove:** Delete the definition of a selected method. (In the table: Select the method you want to delete, and click **Remove**.)

Advanced Settings tab: attribute mapping features

Directory objects in both Domino and Active Directory are saved as database records. Each object record contains an assortment of data elements—what we call "attributes" or "fields"—for things such as first name, last name, title, department, office, phone number, email address and so forth. Domino and AD save many of the same object attributes, although they often don't identify them by the same attribute names, and each directory contains some attributes that the other does not. Also, both Domino and AD offer several undefined attributes that you can customize (assign and name) for your own purposes.

When objects are copied from one directory to the other, or object data is synchronized between the two directories, the updating process must be told how the object attributes in the two environments correspond to one another—for example, so users' middle names in one directory don't appear as their phone numbers in the other.

CMN's Directory Connector knows how the default Domino and AD object attributes correspond to one another, and these default attribute mappings are suitable in most environments. But since many organizations customize their use of directory object attributes, the DC's *Advanced Settings* tab lets you customize a connector's attribute mappings to meet your own local needs.

Attribute mapping is necessary when copying entire objects from one directory to another (provisioning) or when copying the field contents of an object in one directory to the corresponding field of the same object in the target directory (updating). Attribute mapping isn't used when deleting objects, since deletions occur at the object level, not at the field (attribute) level.

The DC *Advanced Settings* tab for each of the four object types offers two sub- tabs for attribute-mapping features. Both tabs (features) define how attributes in the source directory will correspond to attributes in the target directory, but:

- **Provision Attribute:** Defines these attribute mappings for when the connector is *provisioning* (adding new) objects in the target.

- **Update Attribute:** Defines these attribute mappings for when the connector is *updating* (editing) objects in the target.

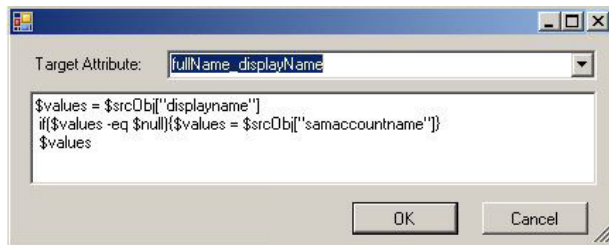
Either tab opens the same panel for attribute mappings:

The *Attribute Mappings* panel shows a table that lists the defined mappings for the selected connector—for either the provisioning or updating function. Each line in the table is independent of the others, since no two lines can define mapping for the same target attribute.

The buttons below the table let you define new attribute mappings or edit existing mappings in any of four ways:

- **Add Empty:** Add an "empty" mapping, to always assign a null value to a particular **Target Attribute**. In the *Add Empty* dialog box, select the **Target Attribute** from the drop-down list, and click **OK**:
- **Add Script:** Define a script to determine the values to assign to a particular **Target Attribute**. (See sample script in the screenshot below.)

Select the **Target Attribute** from the drop-down list, type the script into the text box, and click **OK**.



Note that a script can be used to assign different values *conditionally* (per object), whereas a *rule* (next option below) cannot. A script can test environmental conditions (per object), as shown above, and then assign different values depending on the outcome of the test.

- **Add Rule:** Define a rule to determine how attribute values will be composed, assembled, processed or otherwise derived to be assigned to a particular *Target Attribute* for various objects. A DC connector evaluates an attribute value *rule* as an expression, and for each object assigns the result to the specified *Target Attribute*.

A *rule* assembles an assignment value for each object from any number, combination and sequence of source attribute values and text strings, which in turn may be processed by:

- Keeping only a specified portion of the string (defined by the starting and ending character positions), and discarding the rest.
- Appending a string of "fill" characters to fill the capacity of the attribute field (character may be a space or any other specified character).
- Trimming a string of repetitive "fill" characters (e.g., spaces) that follow an attribute value.
- Setting a capitalization preference for alphabetic characters in the value.

Select the **Target Attribute** from the drop-down list, use the on-screen controls to enter the rule into the text box, and click **OK**.

- **Add Map:** Define a simple mapped association to assign (for each object) the value of a particular **Source Attribute** to the object's particular corresponding **Target Attribute**. Use the drop-down lists to specify the source and target attributes, and click **OK**:

After you have defined an attribute mapping (when it appears in the table), you can edit its definition or delete it altogether.

- **Edit:** Edit the definition of a selected mapping. (In the table: Select the mapping line you want to edit, and click **Edit**.)
- **Remove:** Delete the definition of a selected mapping. (In the table: Select the mapping line you want to delete, and click **Remove**.)

Advanced Settings tab: object filtering features

A CMN DC connector can be configured to include in its operations only certain objects that meet one or more certain conditions, or that meet *any* of a list of conditions. These object filters are defined independently for the four object types: *Users*, *Contacts*, *Groups* and *Resources*. Then, for each object type, object filter sets also are defined independently for a connector's different operations: provisioning objects, updating objects and deleting objects.

The Directory Connector *Advanced Settings* tab offers three sub-tabs to control object scope and filtering:

- **Source Scope:** Selects objects from the source system for processing. During synchronization, the *Provision* and *Update* filters may further refine the objects included.
- **Provision Filters:** Prior to the selected connector operation, defines the objects within the source scope that will be provisioned (newly created).
- **Update Filters:** Prior to the selected connector operation, defines the objects within the source scope that will be updated.

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NOTE: Existing target objects excluded by the *Provision* and *Update* filters do not cause deletion of corresponding target objects. Only manually deletion of source objects or changing the source scope will delete the corresponding target objects.

Any of the three tabs opens the same panel for object filtering:

This *Object Filtering* panel shows a table that lists the defined filter(s) for the selected operation (tab) for the selected object type (tab) of the selected connector. Each line in the table defines a single filter, which tells the connector to include in its operation only objects that satisfy the filter's defined condition(s).

Important: If two or more filters appear in the table, they are logically associated by the **OR** operator. That is, an object is included by the connector if it passes *any* of the individual filters in the list. Each additional filter in the list makes the overall *set* of filters *less* restrictive.

Buttons below the table let you add new filters to the list, edit a previously defined filter in the list, or delete a filter from the list:

- **Add Filter:** Add a new filter to the table list.
- **Edit:** Edit the definition of a selected filter. (In the table: Select the filter you want to edit, and click **Edit**.)
- **Remove:** Delete the definition of a selected filter. (In the table: Select the filter you want to delete, and click **Remove**.)

The **Add** and **Edit** buttons both open the *Filter Definition* dialog box (described below), which lets you define a single new filter.

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IMPORTANT: If you are upgrading from an earlier version connector and want to update Users as well as Contacts, and have chosen to **Overwrite Object Names** (on the *General* tab of *Advanced Settings*): You must also remove the filter condition that excludes user objects from the *Update* function, here in the *Update Filters* tab. Select the **Filter Name** for the filter definition that contains this condition:

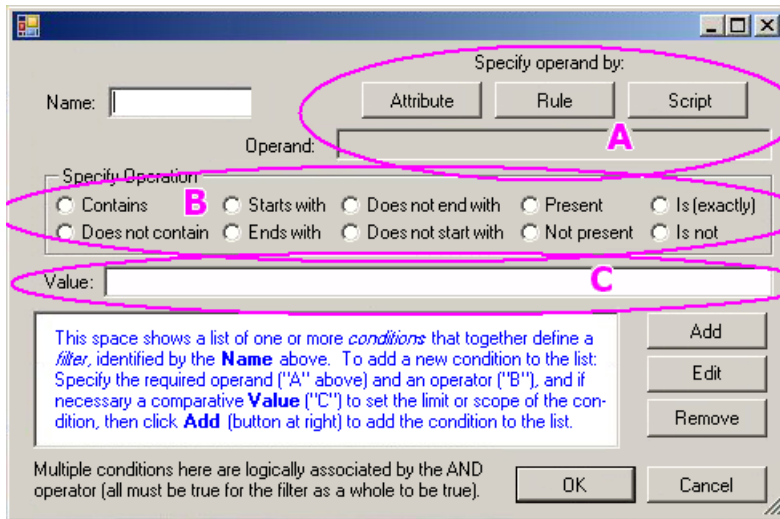
`%script% Equals,contact`

Then click the **Edit** button to open the *Filter Definition* dialog box, select the `[%script% Equals,contact]` line, click **Remove**, and click **OK** to save the filter.

Filter Definition dialog box

The *Filter Definition* dialog box is designed to help you compose one or more *conditions* to make up an object *filter*.

A DC connector filter *condition* is defined in the form of an expression that evaluates to either *true* or *false*, and that is composed of at least one operand ("A" in the illustration) with an operator ("B"). For most conditions a second operand ("C") is also required to define the limit or scope of the operator ("B").



Note that a second operand ("C") is required for any operator ("B") other than *Present* or *Not present*, since only expressions with one of those two operators can be evaluated without a second, comparative operand value. Any of the other eight operators would be meaningless without a second operand to compare to the value of the first operand ("A").

The flow chart below illustrates this process.

To define a new filter (beginning on the object filtering panel):

- 1 Click **Add Filter** to open the *Filter Definition* dialog box (shown above).
- 2 Enter a **Name** for the filter, as you want it to appear in the filters table in the *Object Filtering* panel (for visual identification purposes only).
- 3 Use the **Attribute** or **Rule** or **Script** feature (buttons in the top-right corner of the dialog box) to define the required operand. Clicking any of these buttons pops up the associated dialog box, in which you can define the attribute, rule or script that you want to use to determine the required operand of the expression.
 - **Attribute:** Select a **Source Attribute** from the drop-down list box, whose value (per object) will be inserted as the required operand of this conditional expression. Use the drop-down lists to specify the source and target attributes, and click **OK**:
 - **Rule:** Define a rule to determine how values will be composed, assembled, processed or otherwise derived (per object) for the required operand of this expression. A DC connector evaluates this *rule* as a "sub-expression," and inserts the result for each object into the conditional expression as the required operand.

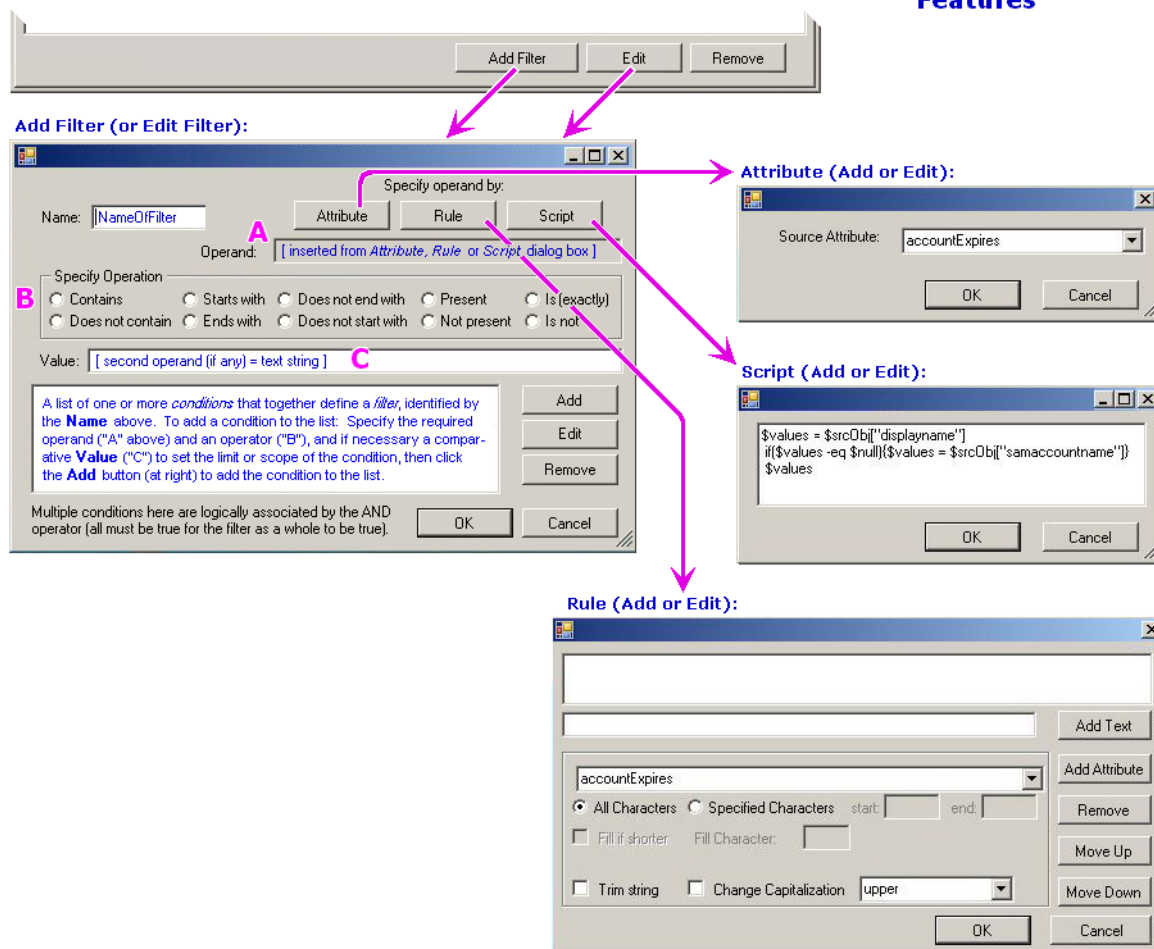
A *rule* assembles an assignment value for each object from any number, combination and sequence of source attribute values and text strings, which in turn may be processed by:

- Keeping only a specified portion of the string (defined by the starting and ending character positions), and discarding the rest.
- Appending a string of "fill" characters to fill the capacity of the attribute field (character may be a space or any other specified character).
- Trimming a string of repetitive "fill" characters (e.g., spaces) that follow an attribute value.
- Setting a capitalization preference for alphabetic characters in the value.

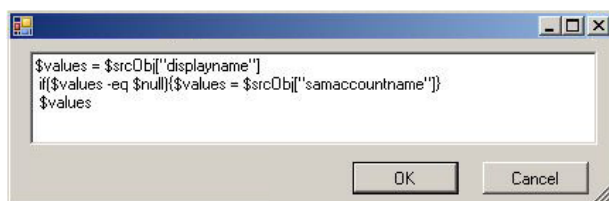
Use the on-screen controls to enter the rule into the text box, and click **OK**:

- **Script:** Enter a script (see sample script in screenshot below) to determine the values to assign to the required operand for the condition. Type the script into the text box, and click **OK**.

Object Filtering Features



Note: A script can be used to assign different values *conditionally* (per object), whereas a *rule* (the preceding option above) cannot. A script can test environmental conditions (per object), as shown in this example, and then assign different values depending on the outcome of the test.



From the *Attribute*, *Rule* or *Script* dialog box: Click **OK** to dismiss the dialog box and insert the newly defined attribute, rule or script into the **Operand** field of the *Filter Definition* dialog box.

- Click one of the **Specify Operation** radio buttons to specify the operator to be used in this expression.
- If this condition requires a comparative operand (i.e., following any operator other than *Present* or *Not present*) to set the limit or scope of the condition: Type the operand value into the **Value** text box.
- Click the **Add** button to compile the operand(s) and operator into a conditional true/false expression. The program then inserts a one-line summary of the condition into the list to the left of the **Add** and **Remove** buttons. For example:

mail IsPresent,
postoffice NotContain,Birmingham
postoffice NotContain,Denver

- 7 Repeat steps 3–6 for each condition you want to define as part of this same filter.

A filter may contain one or more conditions. Each condition defined for this filter will appear as one line in the list to the left of the **Add** and **Remove** buttons.

Remember: Multiple conditions defined for a single filter (in the same displayed list) are logically associated by the **AND** operator. That is, the filter is deemed satisfied for a given object only if *all* of the conditions in the list are met.

Advanced Settings tab: object association features

A CMN DC connector needs to be told how to determine which objects in the source directory correspond to which objects in the target. The method for this object association (or object matching) must be specified to every DC connector, together with any other information the connector will need to perform the actual match-ups by that method.

Object association is usually accomplished by finding an object attribute in the source whose values are unique per object, and also reliably match the values of some attribute in the target directory, which also must be unique per object. The two such attributes are called "matching" attributes, and they must be specified to the CMN DC connector if this is the association/matching method the connector will use. Typically these key fields are the SMTP email addresses on both sides, but the matching attributes may vary in environments where source and/or target attributes have been customized.

A DC connector associates source and target objects by comparing per-object values in the source to per-object values in the target. These per-object values can be defined as simple attribute values, as described above, and can also be defined by rules and/or scripts. Also, the source and target comparison values need not be derived in the same way—that is, the source value may be a simple attribute value, while the connector may derive target values by a rule or script.

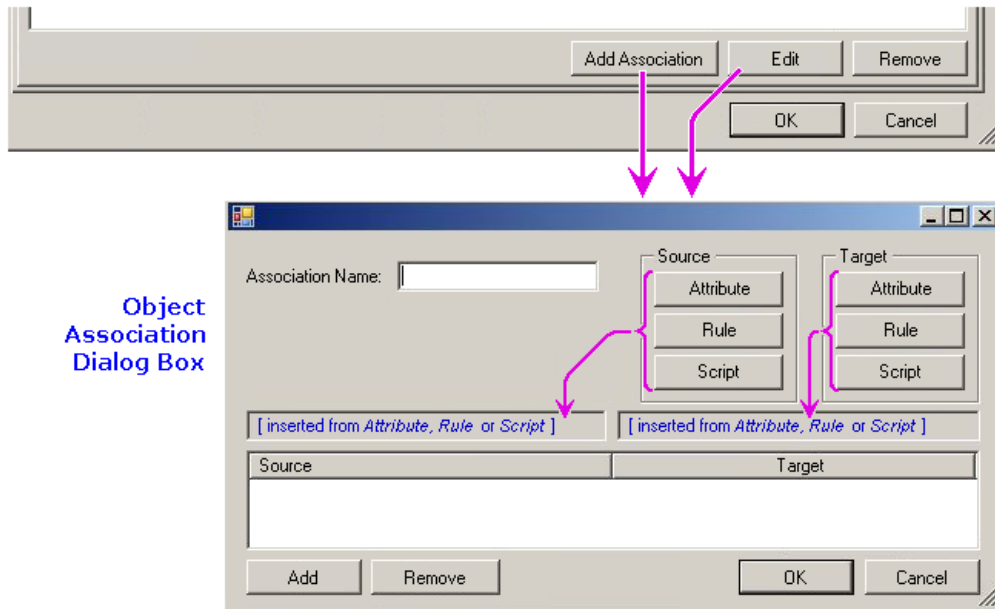
The *Object Association* dialog box may contain one or more defined associations. If two or more associations are defined in the list, the connector considers them one at a time, sequentially, top to bottom. That is, for each source object, the connector first applies the first method in the list and, if no match is found, will then try the second, and then the third, and so forth until a match is found.

When a match is found, a connector configured to *Update* objects then compares attribute values in the source to the corresponding (mapped) attribute values in the target, and updates target values as necessary.

If no match is found in the target for an object in the source, the connector concludes it is a new source object (previously unprovisioned), and copies it to the target—if the connector is configured to *Provision* new objects.

In any case, the connector then advances to the next source object in the list.

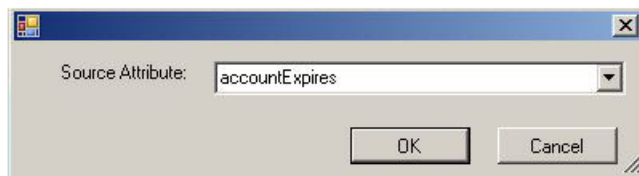
When all source objects have been processed in this way, any remaining, unmatched target objects are presumed to correspond to objects that have been removed from the source. If the connector is configured to perform the *Delete* operation, it then deletes such objects from the target.



Object
Association
Dialog Box

To define the object-association method(s) for a connector:

- 1 Beginning in the *Advanced Settings | Association* panel: Click **Add Association** to open the *Object Association* dialog box.
- 2 Enter an **Association Name**, as you want it to appear in the table list in the preceding *Association* panel (for visual identification purposes).
- 3 Use the **Attribute** or **Rule** or **Script** features (top-right corner of the dialog box) to define the comparative values for both the **Source** (left) and **Target** (right) objects. Clicking any of these buttons pops up the associated dialog box, in which you can define the attribute, rule or script that you want to use to yield per-object values for comparison:
 - **Attribute:** Select an **Attribute** from the drop-down list box, whose value (per object) will be inserted as the source or target comparative element of this association. Use the drop-down list to specify the attribute, and click **OK**:



- **Rule:** Define a rule to determine how comparative values will be composed, assembled, processed or otherwise derived (per object) for source or target comparative element of this association. A DC connector evaluates this *rule* as a "sub-expression," and inserts the result for each object into the conditional expression as the source or target comparative element.

A *rule* assembles an assignment value for each object from any number and combination of source attribute values and text strings, which in turn may be processed in these ways:

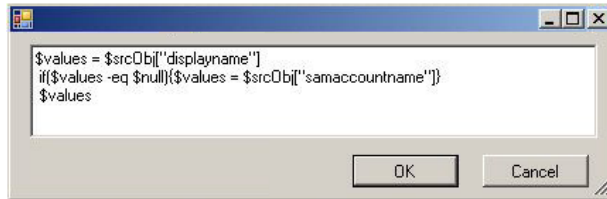
- Keep only a specified portion of the string (defined by the starting and ending character positions), and discard the rest.
- Append a string of "fill" characters to fill the capacity of the attribute field (character may be a space or any other specified character).
- Trim a string of repetitive "fill" characters (e.g., spaces) that follow an attribute value.

- Set a capitalization preference for alphabetic characters in the value.

Use the on-screen controls to enter the rule into the text box, and click **OK**:

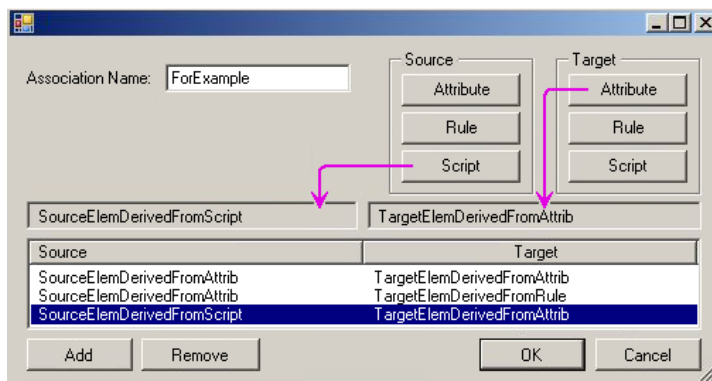
- **Script:** Enter a script (see example in the screenshot below) to determine the values to assign as the source or target comparative element of this association. Type the script into the text box, and click **OK**.

Note: A script can be used to assign different values *conditionally* (per object), whereas a *rule* (preceding option above) cannot. A script can test environmental conditions (per object), as shown in this example, and then assign different values depending on the outcome of the test.



Clicking **OK** from the *Attribute*, *Rule* or *Script* dialog box tells the program to dismiss the dialog box and insert the attribute name or the newly defined rule or script into the appropriate comparative-element field of the *Object Association* dialog box.

- 4 Back in the *Object Association* dialog box: Click the **Add** button (bottom-left corner) to add the displayed source-target pair of comparative elements into the table list as a single condition of this association definition.



- 5 If you want to add another condition (source-target pair) to the list, repeat steps 3 and 4.

Two or more such pairs listed within a single association definition are logically associated by the **AND** operator. That is, a source object and target object will be deemed associated by this method only if the object pair satisfies **all** of the conditions in this list.

- 6 Still in the *Object Association* dialog box: When you have defined all of the conditions (source-target pairs) you want to include in this association definition, click **OK** to dismiss the *Object Association* dialog box and add the newly defined association method into the table list on the *Advanced Settings | Association* panel.

Repeat this procedure for each such association you want to add to the list. Remember that if multiple associations are defined in the list, the connector considers them one at a time, sequentially, top to bottom.

Advanced Settings tab: source and target attributes

These tabs let you add additional attributes that are not in the default source/target object attribute list. Once you add an attribute, the attribute is appended to the available attribute list, where you can use for attribute mapping, object filtering or object association features.

Starting and stopping the Directory Connector service

The Directory Connector service is started manually, and thereafter runs continuously until explicitly stopped. CMN's Directory Connector service performs many of its features by calling functions that are coded in a separate underlying "engine" application (another Windows service) called the Directory Sync service. Since the Directory Connector and Directory Sync services communicate with each other, both must be stopped and started together.

- i** | **NOTE:** CMN's Directory Connector service must be running to enable the operation of its connectors. If the service is turned off, it will be unable to track scheduled run times, and no connectors will run.
- i** | **NOTE: Also,** if CMN's Directory Connector service is inadvertently interrupted or disabled by some processing error, the Directory Sync service must always be restarted whenever the Directory Connector service is restarted.

To start or stop the Directory Connector and Directory Sync services:

The CMN Directory Connector service and the Directory Sync service can be started and stopped directly from the CMN Directory Connector Management Console.

To configure the service's behavior upon Windows startup:

- 1 Use Windows' **Services** console: Open the Windows Control Panel **Administrative Tools**, and then open (double-click on) Windows' **Services**.
- 2 Select the service from the list (*Quest Directory Connector* or *Quest Directory Sync*), and verify or change the value in the **Startup Type** column:
 - **Automatic:** If you want this service to automatically start when the operating system boots (or reboots—e.g., after a system restart).
 - **Manual:** If you do *not* want this service to automatically start when the operating system boots.

- i** | **NOTE:** If you choose **Manual** here, and if the host computer is shut down or restarted while the service is running, you will have to manually restart the service after the computer is restarted.

To change the setting, double-click anywhere on the selected service, and change the value in the **Startup type** drop-down list box. Then click **OK**.

CMN Mail Connector

- [Mail Connector features overview](#)
- [Coexistence mail routing basics](#)
- [Deployment of CMN Mail Connector](#)
- [Installation](#)
- [Configuration](#)
- [Mail Connector Management Console](#)

Mail Connector features overview

The CMN Mail Connector is a Windows service that monitors SMTP traffic between Domino and Exchange to resolve incompatibilities. This service detects and converts messages as necessary to facilitate (for example):

- Invitations to recurring meetings.
- Requests to reschedule meetings, or series of recurring meetings.
- Cancellations of single meetings, or entire series of recurring meetings.
- Bi-directional resource booking.
- Notes links.
- Attachments to single meetings or series of recurring meetings.
- Notes "To Do" tasks, relayed to Exchange recipients as HTML renderings (provided by Notes) that detail the tasks. CMN also strips .ics attachments from these messages.

The CMN Mail Connector also detects and converts Notes rich-content features whereby messages can carry "live" or "active" functional content. See [CMN active mail processing](#) below for more information.

The Mail Connector functions as a passive SMTP interface between Domino and Exchange. That is, the Mail Connector does not establish a connection or store output of processed messages. CMN converts messages containing calendar data, active mail and DocLinks, while other messages simply pass through to the destination server.

CMN notifications and "friendly bounces"

CMN occasionally encounters an incompatibility between Notes and Exchange that it cannot correct by any practical means. CMN is able to detect most such instances and insert a brief note into the message body notifying the recipient and recommending a manual resolution. For example:

If this invitee is on an Exchange server in a different time zone from your Domino server: The counterproposed date shown here may be a day off from the actual date, due to incompatibilities between the Domino and Exchange servers.

Your calendar will process the counterproposal correctly, but you should then check your calendar to verify the date for your own information.

In some uncommon scenarios, uncorrectable calendar incompatibilities prevent the completion of whatever the sender intended. In such cases, CMN aborts the attempt rather than relaying an item that it knows will fail. Instead, CMN sends a note back to the sender with an explanation and a suggested course of action. This courtesy note back to the sender is called a "friendly bounce," since it is meant to be helpful in its explanation and suggested remedy. For example:

*Your invitation has **not** been delivered. Encrypted invitations from Notes to Outlook are not supported, due to incompatibilities between the two environments.*

Suggested Action: Resend the invitation without encryption, by de-selecting the **Encrypt** delivery option in Notes.

CMN active mail processing

Notes environments offer an assortment of rich-content mail features whereby messages carry "live" or "active" functional content for things such as:

- Stored forms (created with **Store form in document**).
- Embedded buttons, hotspots, collapsible sections, etc.
- Native Notes encryption.
- Unsupported rich-text elements (e.g., tabbed tables).

These features, which we collectively call "active mail," would normally be lost or degraded when delivered to an Exchange recipient, due to differences between the mail platforms. However, CMN's Mail Connector can detect and process active mail content to preserve this functionality.

CMN detects messages en route to Exchange with active mail content, and encapsulates the functionality within an NSF file attachment. CMN also inserts a note into the message body:

This email contains content that can only be viewed in Lotus Notes. To view this content, double-click on this email within Outlook so it opens in a separate window. Then you may double-click on the attached file [filename] to open it in Lotus Notes.

Assuming a Notes client is still installed on the Outlook recipient's computer, and the NSF file type is associated (in Windows) with the Notes client application, the Outlook recipient simply double-clicks the icon to open the attached NSF file into Notes, with the fully functional active mail content in view.

The additional processing required for active mail message attachments does place a slightly higher load on the Mail Connector, but in most environments the difference is negligible. In any case, active mail processing is an optional feature that is easily enabled or disabled in the Mail Connector Management Console.

About Notes 8.5 Compatibility Mode

Lotus Notes versions 8.5 and higher offer a configuration called *Compatibility Mode*. This configuration *limits* the functionality of the Notes calendar to those functions that will be seamlessly supported by other mail systems.

Some have wondered if Notes' Compatibility Mode might be a reasonable alternative to CMN's Mail Connector for calendar coexistence. While this configuration option may suffice for organizations that use only basic calendar functions, it will limit calendar functionality for all users. IBM concedes in its own documentation that, with Compatibility Mode, "you will not be able to update more than one repeating meeting instance at a time, use custom repeating meetings, or specify weekend rules for repeating meetings." A quick comparison shows Quest CMN's Mail Connector delivers a much richer calendar coexistence without placing limitations on end users.

While preserving a high level of calendar functionality, CMN's Mail Connector also properly processes active mail from Notes, enables free/busy functionality between the two systems, and converts DocLinks for use in Exchange.

If you would like to see a more detailed comparison, please contact your Quest Sales representative.

Mail Connector Performance Counters

CMN generates sets of performance counters for its Mail Connector that feed live data to Windows' System Monitor feature. If you are unfamiliar with Windows' System Monitor feature, or how to add CMN counters to the System Monitor view, see your Microsoft documentation and/or visit the System Monitor online Help for more information.

The CMN Mail Connector generates these performance counters:

- **Calendar Processing Throughput:** Number of calendars processed per second.
- **Message Processing Throughput:** Number of messages processed per second.
- **Message Processing Bytes Throughput:** Number of message bytes processed per second.
- **Exchange To Domino Calendar Processing Throughput:** Number of calendars processed per second (Exchange To Domino).
- **Exchange To Domino Message Processing Throughput:** Number of messages processed per second (Exchange To Domino).
- **Exchange To Domino Message Processing Bytes Throughput:** Number of message bytes processed per second (Exchange To Domino).
- **Active Mail Processing Throughput:** Number of Active Mail- containing messages processed per second (Domino To Exchange).
- **Active Mail Dropdown Processing Throughput:** Number of Active Mail dropdown-containing messages processed per second (Domino To Exchange).
- **Active Mail Encrypted Database Processing Throughput:** Number of Active Mail encrypted-database-containing messages processed per second (Domino To Exchange).
- **Active Mail Stored Form Processing Throughput:** Number of Active Mail stored-form-containing messages processed per second (Domino To Exchange).
- **Active Mail Hotspot Processing Throughput:** Number of Active Mail hotspot-containing messages processed per second (Domino To Exchange).
- **Active Mail Missing Form Field Processing Throughput:** Number of Active Mail missing-form-field-containing messages processed per second (Domino To Exchange).
- **Active Mail Rich Markup Processing Throughput:** Number of Active Mail rich-markup-containing messages processed per second (Domino To Exchange).
- **Domino To Exchange Calendar Processing Throughput:** Number of calendars processed per second (Domino To Exchange).
- **Domino To Exchange Message Processing Throughput:** Number of messages processed per second (Domino To Exchange).
- **Domino To Exchange Message Processing Bytes Throughput:** Number of message bytes processed per second (Domino To Exchange).

Coexistence mail routing basics

Email coexistence, with or without CMN, can be configured within a single domain ("single namespace"), or you can differentiate the two environments with different domains or subdomains—for example, *domino.sitraka.com* vs. *exchg.sitraka.com*. CMN's Mail Connector integrates easily into either method.

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NOTE: When coexisting with Office 365: Direct free-busy lookups from Office 365 to Notes are not possible with a single-namespace configuration, in either a hybrid or non-hybrid implementation, due to access/permission restrictions to the remote Microsoft servers. Bi-directional free/busy features with Office 365 can be configured only with routing domains (e.g., *coexist.sitraka.com*).

By the multi-domain/subdomain method, Domino and Exchange are assigned different subdomains to differentiate the two internally (within your network), so email can be routed between the two servers by SMTP addressing and your organization's DNS configuration. To insert CMN's Mail Connector into this scheme, point the outbound traffic from each server to the Mail Connector server, and point the Mail Connector's outbound mail to the appropriate Notes or Exchange server, depending on the domain/subdomain name in the address.

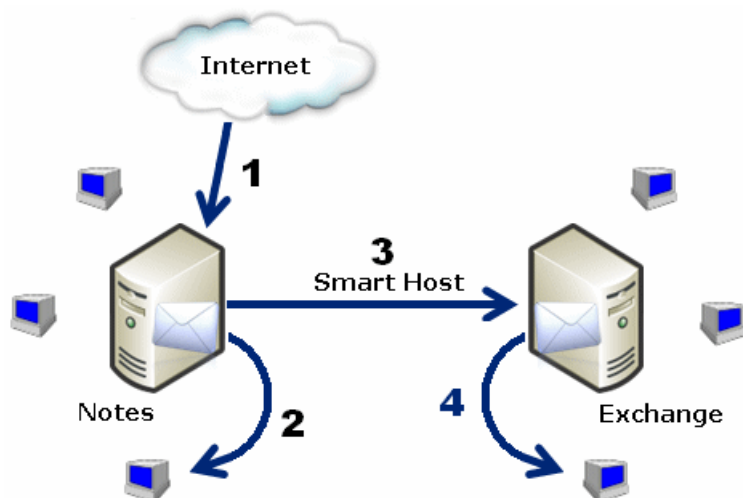
The multi-domain/subdomain methods are straightforward, but configuration is somewhat more complicated than with the single-namespace methods. A subdomain routing method may also introduce a risk that the assigned subdomain names will escape your organization's internal communications, which in turn can cause bounce-backs on replies to those addresses. To prevent this, set the Notes *forwarding address* attribute to *user@subdomain@notesdomain*, which tells Domino to set the reply address for external email to the user's primary SMTP address (internet address field value).

A single-namespace mail coexistence is accomplished by using smart hosts in both directions.

Single-namespace message routing without CMN

The next three diagrams illustrate email routing in a single-namespace mail coexistence between Notes and Exchange—without CMN. This is native functionality and does not involve any Quest product.

Internet message routing (via Notes)

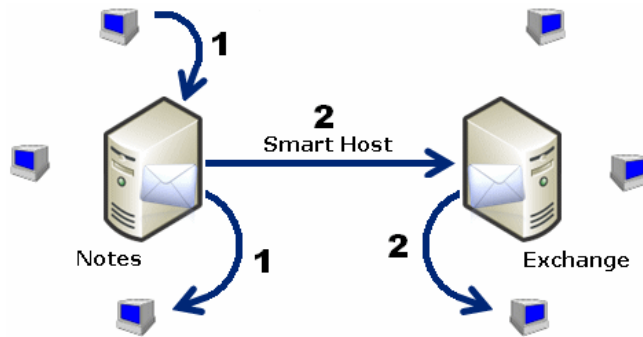


The step numbers here correspond to the numbers in the diagram:

- 1 Messages arrive from the Internet.
- 2 A message for a native Notes user is delivered locally.
- 3 A message for a user familiar to Notes, but who has a mailbox in Exchange, is sent through the smart host to Exchange via SMTP. (The Domino Directory contains a person document that specifies the recipient's Exchange mailbox, most likely when the Exchange user has been migrated from Notes.)
— OR —
A message for a native Exchange mailbox that is unknown to Notes beyond the domain name, is sent through the smart host to Exchange via SMTP. (Notes is unaware of the native mailbox in Exchange.)
- 4 The message is delivered to the Exchange user.

Inbound traffic is routed to Notes first in this example, but could just as easily be routed to Exchange first.

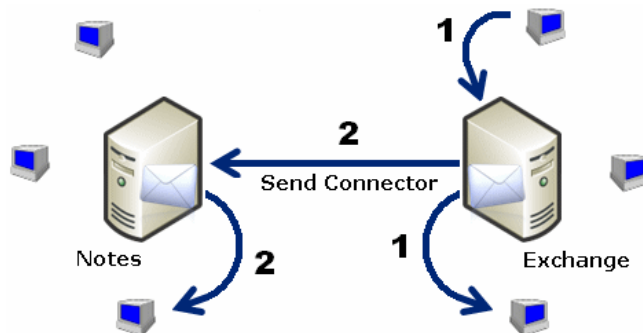
Notes message routing



The step numbers here correspond to the numbers in the diagram:

- 1 **Message sent from one native Notes user to another.** Delivered locally: Domino recognizes the recipient's valid local (Notes) address, so routes it internally rather than sending to the smart host.
- 2 **Message sent from native Notes user to Exchange user.** Two possibilities: The Exchange user either is unknown to Notes, or is represented in Notes only by a person document. In either case, Notes cannot find a local mail file for the recipient, so routes the message to the smart host for relay to Exchange, where a recipient lookup permits delivery to the appropriate mailbox. If the recipient is present in the Domino directory, then Notes found the forwarding address in the contact document (mail system is also set to "Other Internet Mail") and sent it with the message to the smart host.

Exchange message routing



This diagram labels the Exchange smart host as the "Send Connector," which is the Exchange brand of smart host.

The step numbers here correspond to the numbers in the diagram:

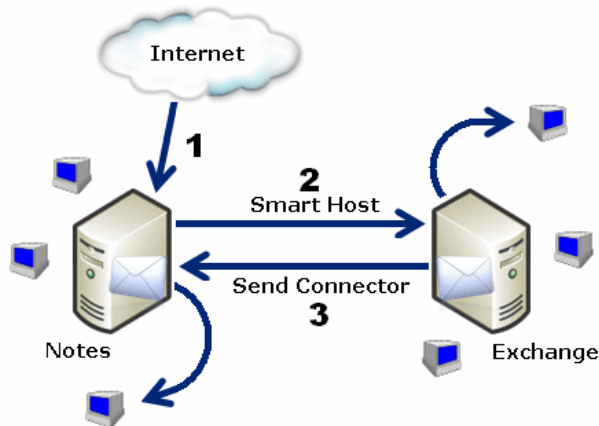
- 1 **Message sent from one native Exchange user to another.** Delivered locally: Exchange recognizes a valid local mailbox for the message, so routes it internally (doesn't send it to the Send Connector for external delivery).
- 2 **Message sent from native Exchange user to Notes user.** Two possibilities: The Notes user either is represented in Active Directory as an external contact, or is simply unknown to Exchange. In the first case, Exchange finds a forwarding address associated with the contact ("targetaddress" attribute in AD), and sends the message via the Send Connector to Domino, where it is delivered to the appropriate mail file. In the second case, the message is still routed to Notes via the Send Connector, but Notes will be able to deliver it only if the appropriate mail file exists.

Email coexistence before and after CMN

Remember that email coexistence can be configured either within a single namespace, or by differentiating the two environments with different domains (or subdomains—e.g., *domino.sitraka.com* vs. *exchg.sitraka.com*). The CMN Mail Connector is easily integrated into either strategy, but most admins prefer the single-namespace approach because it is usually simpler to configure.

The sections below explain and illustrate how Quest's CMN Mail Connector integrates into a single-namespace coexistence between Notes and Exchange. Round-robin traffic distribution can be used for load balancing and redundancy among multiple CMN servers.

Single-namespace coexistence without CMN

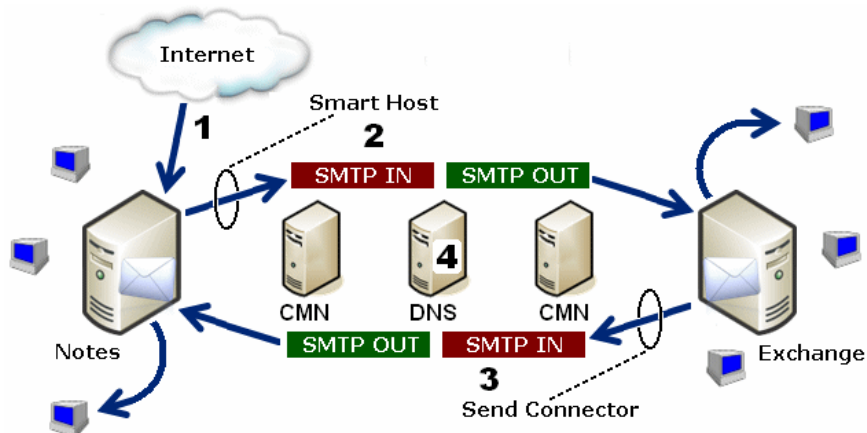


SMTP mail routing within a single domain is accomplished using smart hosts in both directions, as shown in the illustration here. Exchange can be configured to route mail to a smart host (the Exchange Send Connector) if Exchange determines the recipient is not in its local Internet domain. Exchange reads the *targetAddress* attribute in the AD object record to route mail for such recipients to the Send Connector. Meanwhile, Domino is configured to do the same thing in reverse for a recipient whose local internet domain address is not listed in any Domino person documents.

The step numbers here correspond to the numbers in the diagram:

- 1 The routing for inbound external messages is pointing to Notes.
- 2 Smart host routes mail to Exchange for any user without a native Notes mail file—typically represented in Notes by a person document set to "Other Internet Mail."
- 3 Send Connector routes mail back to Notes for a user without a native Exchange mailbox—represented in Exchange by an external contact.

Single-namespace coexistence with CMN



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NOTE: When coexisting with Office 365: Direct free-busy lookups from Office 365 to Notes are not possible with a single-namespace configuration, in either a hybrid or non-hybrid implementation, due to access/permission restrictions to the remote Microsoft servers. Bi-directional free/busy features with Office 365 can be configured only with routing domains (e.g., *coexist.sitraka.com*).

The step numbers correspond to the numbers in the above diagram:

- 1 The routing for inbound messages is pointing to Notes:
- 2 When CMN's Mail Connector is installed and configured, the previously configured smart host in Notes must now point to the CMN server. CMN is configured to accept mail from Notes and deliver mail to the receiving Exchange server.
- 3 Similarly, the Exchange Send Connector must now point to the CMN Mail Connector(s). CMN is configured to receive mail from Exchange and deliver messages to the qualified Notes server.
- 4 Multiple CMN servers can be deployed for load balancing and redundancy. Since smart hosts are being used in this scenario, MX priority cannot be used for redundancy. Instead, CMN rotates through all available Exchange or Domino servers in the configuration.

Any of CMN's defined outbound servers may in turn point to a load balancer, in which case multiple DNS host records can be created, each for a different IP address, but the same host name. For example, three *cmn.sitraka.com* records can be created, each with a different IP. See [this Microsoft article](#) for more information about DNS round robin.

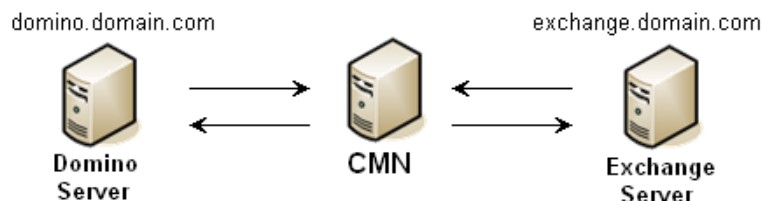
Deployment of CMN Mail Connector

Simple configurations

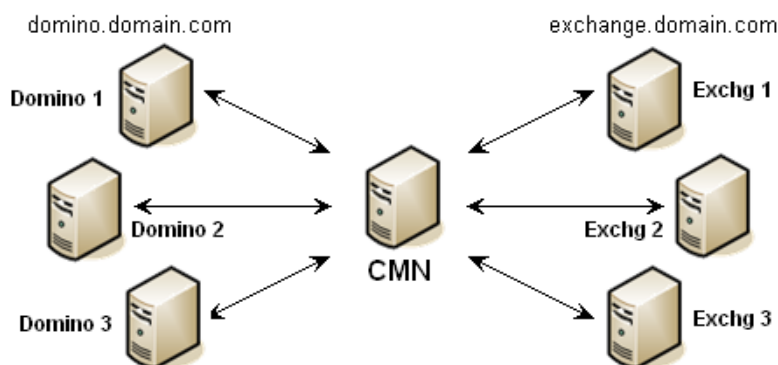
A single instance of CMN's Mail Connector may connect through a single Notes server and a single Exchange server, or between multiple mail servers on either or both sides of the CMN service. Regardless of the number of servers or your preferred routing scheme, all mail servers on both sides must be defined in the CMN Mail Connector configuration file. Inbound and outbound servers may be specified to CMN by their DNS names, IP addresses, or MX record notations. For receipt of inbound messages (from the Internet), CMN distributes the traffic among multiple mail servers on either side in a round-robin array.

Single Instance of CMN Mail Connector

With single mail server on each side:

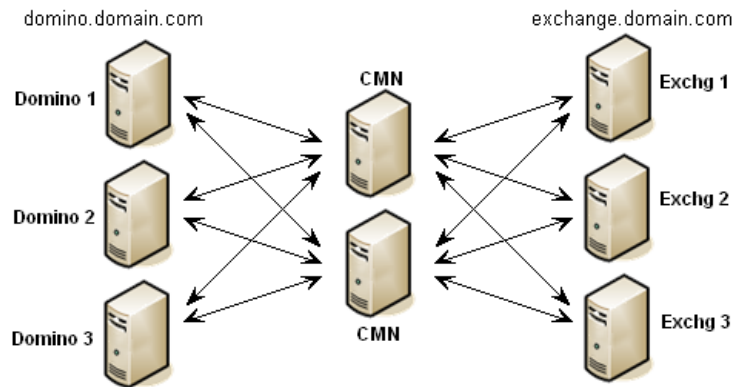


With multiple redundant mail servers:



Redundant CMN Mail Connectors

CMN Mail Connector: Multiple Redundant Instances



Multiple instances of the Mail Connector can be deployed for load balancing and to provide redundant mail paths.

As shown here, any CMN server can receive email from any mail server defined in the configuration file, and likewise can relay messages to any of the defined destination servers.

In multiple-CMN schemes, the CMN servers can be load-balanced by MX-record priority designations used by the source mail system or a more formal load-balancing mechanism.

Message distribution among multiple servers

CMN's Mail Connector interprets and honors MX priority settings to intelligently distribute messages in prioritized round-robin fashion. Priority designations run in reverse-numerical order, where the highest priority is 0, and higher priority numbers represent less preferred servers.

When MX resolution is enabled for CMN's outbound servers, the Mail Connector attempts a connection at the highest priority level, and if unsuccessful attempts a connection with another server (if any) at the same priority level, or at the next lower priority level only if no server at the higher priority level is available. Within each group of servers at the same priority level, the Mail Connector randomly selects a server in the group for its first connection attempt, and then if unsuccessful proceeds to the other servers in random round-robin fashion.

If MX resolution is not enabled for the CMN servers, messages are distributed in random round-robin fashion among all configured servers.

CMN and hosted Exchange environments

CMN's Mail Connector can easily be configured to work with a hosted Exchange environment, such as Microsoft's Office 365 services. A CMN connection with a hosted environment requires only two changes to field values in the [Mail Connector Management Console](#) (described later in this chapter), and two accommodations in server configurations, as noted in the Mail Connector [Installation](#) instructions (also later in this chapter).

There are no performance tips unique to a hosted Exchange configuration with CMN. Hosted Exchange is a slight variation in CMN's server connection validation code; everything else is treated just like regular message traffic.

Installation

The CMN Mail Connector is part of the Quest Quest Coexistence Manager for Notes product. The CMN AutoRun installer asks you to choose the CMN component(s) you want to install. If you have already installed one or two other components, just run the AutoRun installer again to install the Mail Connector. The AutoRun installer must be run on the computer where you want to install the component.

For complete installation instructions, see the *Getting Started* section of the *Quick-Start Guide*.

Configuration

The process of configuring and activating the CMN Mail Connector consists of these general steps, all of which are explained in more detail below. This procedure begins with the assumption that the Notes and Exchange environments are operational, and that the environments conform to the system requirements specified for the current release of CMN (as documented in the most recent RTM *Release Notes*).

Step 1 (conditional): Create the Notes resource mapping file

i | **NOTE:** This step applies only if you want your Exchange users to be able to schedule Notes resources for calendar events. You may skip this step if Exchange users will not schedule Notes resources.

When an Exchange user tries to schedule a Notes resource, Exchange identifies the resource by its SMTP address, but Notes identifies resources by resource names (not by SMTP addresses). CMN must refer to a mapping file that identifies which Notes resource names are associated with which SMTP addresses.

i | **NOTE:** CMN's Mail Connector also supports resource booking in the Notes-to-Exchange direction, but N-to-E resource booking does not require a mapping file. To support free/busy inquiries, the Domino resource is deleted, and CMN's Directory Connector creates a forwarding contact to replace it, to route resource requests to the corresponding resource object in Active Directory. If free/busy is not required, N-to-E resource booking can be accomplished by mail forwarding, where the resource in Domino is configured to forward its mail (resource requests) to the corresponding resource object in AD. (Quest's MNE can automatically configure this mail-routing when it migrates the resource.)

The Notes Resource mapping file is specified (path and filename) in the CMN Mail Connector Management Console on the *Resource Mapping* screen, and can be populated using the **Import From MNE** button on that screen. If you prefer, you could instead create the mapping file manually, as described below (following this *Import from MNE* topic).

Import from MNE

The **Import from MNE** button is on the Mail Connector's *Resource Mapping* screen in the CMN Management Console. The button lets the administrator import resource mapping information from an exported *MNE User and Resource Summary* exported file.

To generate resource mapping information:

- 1 Click the **Import from MNE** button.
- 2 Select the MNE file to import.

A dialog box appears with this message:

Would you like to merge the contents of the MNE imported file with your existing resource map? If you choose No, your current resource map will be cleared first.

- 3 Select **Yes** or **No**.

To add a new resource mapping:

- 1 Click the **Add** button.
This displays the **Add Resource Map** dialog box.
- 2 Enter the **SMTP Address**, **Resource Name**, and **Domino Resource Type**.

The *Domino Resource Type* column lets the administrator select the type of Domino Resource that is defined for each entry: **Room**; **Resource**; or **Online Meeting**. This lets CMN adjust the message so Notes stores the correct **ResourceType ID** in the Notes database.

- 3 Click **OK** to add the entry to the table.

Clicking the **OK** button prompts a validation of the information entered. If there is invalid information or a duplicate SMTP Address is entered, an error message is generated.

To edit an existing resource mapping:

- 1 Double-click the resource map in the list displayed on the *Resource Mapping* screen, or click the **Edit** button.

This displays the *Edit Resource Map* dialog box.

- 2 Enter **SMTP Address**, **Resource Name** and **Domino Resource Type**.

The *Domino Resource Type* column lets you select the type of resource defined for each entry: **Room**, **Resource** or **Online Meeting**. This lets CMN adjust the message so Notes stores the correct **ResourceType ID** in the Notes database.

- 3 Click **OK** to edit the entry. The program then validates the information entered. If the program finds invalid information or a duplicate SMTP Address, it generates an error message.

To delete a resource mapping:

- 1 Highlight the resource mapping in the list and click **Delete**.

A prompt asks you to confirm the command:

Are you sure that you want to remove the selected mapping?

- 2 Click **Yes**.

Saving resource mappings:

- 1 Once you have added, edited or deleted the desired resource mappings, from the **File** menu, click **Save Configuration | Mail Connector**.

If you close the application, you are prompted to save any changes.

How to manually create a Notes resource mapping file:

If you choose to not use MNE and the Notes Management Console to create the Notes resource mapping file, you can manually create the file. The file must be a two-column .tsv-format file, with column headings named *SmtetAddress* and *ResourceName*, containing data in this form:

SmtetAddress	Resource Name
West Bldg Front Conf Rm@sitraka.com	Front Conference Room/West Bldg
West Bldg Main Conf Rm@sitraka.com	Main Conference Room/West Bldg
West Bldg Back Conf Rm@sitraka.com	Back Conference Room/West Bldg
Main Bldg Interview Rm@sitraka.com	Interview Room/Main Bldg

The *ResourceName* value must match the name of the resource as it appears in Notes, which ordinarily takes one of these two forms:

[Resource Name]/[Site]

[Resource Name]/[Category]/[Site]

The *SmtetAddress* must be the *TargetAddress* of the resource in Active Directory.

CMN installs an empty template .tsv file, containing the two column headings, that can be used as a template for building the file.

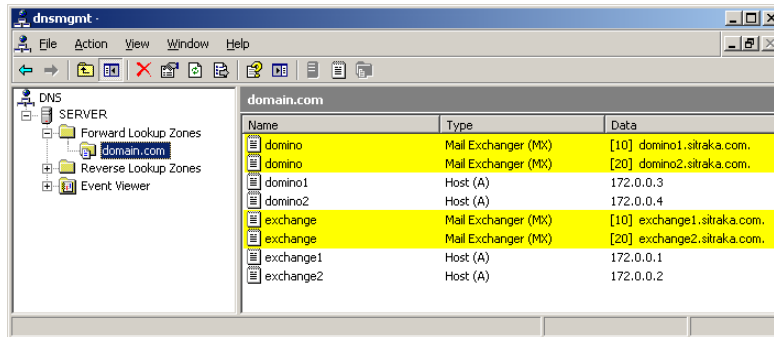
Step 2 (conditional): Configure DNS



NOTE: This step applies only if you will use MX priority ranking to distribute message traffic among multiple mail servers. You may skip this step if MX records will not be used.

Add MX records for both the Domino and Exchange servers to specify the mail servers responsible for handling emails. More than one MX record can be entered for a single domain name using more than one mail server, so the MX records can be prioritized to indicate the order in which the mail servers should be used.

For example:



For CMN with Office 365

If you intend to connect CMN with Microsoft's Office 365:

- 1 Allow inbound routing from the internet to CMN on port 25 (so CMN can receive connection requests from hosted servers).
- 2 Set up MX records or change the internal inbound routing to point to CMN instead of pointing directly to Domino as it is ordinarily configured. (Alternatively, you may continue to route mail directly to Domino from outside, and then configure CMN for remediation only in the Domino-to-hosted-Exchange direction.

Connection with a hosted Exchange environment also requires two slight changes within the Mail Connector Management Console, as explained in the field notes later in this chapter.

Step 3: Run the Mail Connector Management Console

CMN Mail Connector processing options are set within a configuration file, which may be opened, modified and saved as needed. The Mail Connector configuration file controls only the Mail Connector, *not* the Directory Connector or Free/Busy Connector.

CMN includes a Management Console to help you configure the CMN Mail Connector. The MC Management Console edits the component's configuration file according to your entries in the GUI screens.

Most of the processing options for your Mail Connector can be configured in the Mail Connector Management Console. Other operational options can be set manually, by entering or changing settings in the active configuration file, as described below in the next step of this process.

The next major section (after these numbered steps) explains the basic operating principles of the [Mail Connector Management Console](#) and provides screen-by-screen field notes. Run the Management Console now, working through all the program screens, and then return here to continue at step 4.

Step 4 (optional): Review/update Other Mail Connector configuration options

Consider these options to fine-tune your Mail Connector configuration, performance and security. These are all optional, depending on your local circumstances, needs and preferences.

Secure Mail Connector SMTP relay when coexisting with Office 365 (optional)

When coexisting with Office 365, additional measures may be necessary to secure the Mail Connector SMTP relay that may be exposed to the Internet. To secure the Mail Connector from connections from undesired SMTP servers on the Internet, you can place the Mail Connector behind a firewall and allow only traffic from Microsoft's Office 365 environment. The address ranges used by Microsoft can be found in this TechNet article: [Forefront Online Protection for Exchange Online IP Addresses](#).

Configure DNS MX resolution (optional)

DNS MX Resolution may be enabled, configured or disabled by manually editing the Mail Connector's active .xml configuration file. The feature is off by default. To turn it on and/or set its cache-update interval:

- 1 Use an XML editor to open the active configuration file.
- 2 To enable DNS MX Resolution:
 - a Find the `<resolvemx>` parameter, in the `<root>` node. If the `<resolvemx>` parameter does not already exist, create it as shown in the next step below.
 - b Set the `<resolvemx>` parameter value to `true`:

```
<resolvemx>true</resolvemx>
```

If the tags are omitted from the file, the feature is **disabled**.

If the tags appear in the file but are left empty (no value), the feature is **enabled**.
- 3 To set the cache-update interval for the DNS MX Resolution feature:
 - a Find the `<mxcacheupdateinterval>` parameter, in the `<root>` node. If the `<mxcacheupdateinterval>` parameter does not already exist, create it as shown in the next step.
 - b Set the `<mxcacheupdateinterval>` parameter value to the number of seconds you want MX lookups to be cached:

```
<mxcacheupdateinterval>600</mxcacheupdateinterval>
```

The default is 300 seconds (5 mins). You may want to increase the value to reduce the load on the DNS server and/or the network. You may want to decrease the value if you want change to take effect faster or to allow for round-robin resolution.

This feature is applied separately per host. (For example, if server A is resolved at 12:00PM, it will be cached until 12:05, while if server B is resolved at at 12:01PM, it will be cached until 12:06, and so forth. There is no setting that causes all hosts to expire at the same time.
- 4 To set the interval for the MX DNS Resolver:
 - a Find the `<dnsupdateintervalminutes>` parameter, in the `<root>` node. If the `<dnsupdateintervalminutes>` parameter does not already exist, create it as shown in the next step.
 - b Set the `<dnsupdateintervalminutes>` parameter value to allow the MX DNS resolver to update the list of addresses, per the value you specify:

```
<dnsupdateintervalminutes>60</dnsupdateintervalminutes>
```

The default is 0 (not used). The acceptable range is 0 (off) to 2 billion.
- 5 **Close** and **Save** the configuration file under the same filename.

The new settings will take effect the next time the CMN service is restarted.

Configure socket channels (optional)

By default, the Mail Connector waits up to 5 seconds for an available socket channel before opening a new one (if none are then available). This is a "throttling" feature to enforce a time interval for CMN to conclude its communications protocol with a channel before opening another. The actual delay, in seconds, is a "delay factor" (5 by default) x the ratio of the number of open channels to the maximum allowed number of channels. If you want to change the delay factor, you can manually edit the setting in CMN's active configuration file:

- 1 Use an XML editor to open the active configuration file.
- 2 Find the `<routerwaitsecs>` parameter in the `<root>` node of the CMN Configuration file and update its value to suit your circumstances. The value specified (default=5) is the "delay factor."
- 3 **Close** and **Save** the configuration file under the same filename.

The new settings will take effect the next time the CMN Mail Connector service is restarted.

Domino resource Tracking in Exchange (optional)

The CMN Mail Connector can now pass to Exchange the information Exchange needs to accurately track Domino resource information when the resource site name has been manually restored to the resource name in Active Directory. This optional feature can be enabled or disabled by the `<preserveresourcesites>` boolean parameter within the Mail Connector's active .xml configuration file. The parameter is off (*false*) by default (and by omission), but can be enabled by setting the value to *true*:

- 1 Use an XML editor to open the active configuration file.
- 2 Find the `<preserveresourcesites>` parameter in the `<root>` node of the CMN Configuration file and change its value to *true*:

```
<preserveresourcesites>true</preserveresourcesites>
```

- 3 **Close** and **Save** the configuration file under the same filename.

Enable/disable UTC offset display (optional)

CMN's Mail Connector can be configured to automatically include the UTC offset in displayed dates—for example: *12/3/2012 1:00 PM Central (UTC -600)*. This feature is enabled and disabled by a boolean parameter in the `<root>` node of the Mail Connector configuration file (*Configuration.xml*). To enable this feature:

- 1 Use an XML editor to open the active configuration file.
- 2 Find the `<displayutcoffset>` parameter in the `<root>` node of the CMN Configuration file and change its value to *true*:

```
<displayutcoffset>true</displayutcoffset>
```

- 3 **Close** and **Save** the configuration file under the same filename.

The *true* setting enables the feature. The feature is *disabled* by default (`<displayutcoffset>false</displayutcoffset>`).

Append vs. prepend option for CMN-inserted notification messages to users (optional)

CMN's Mail Connector can be configured to insert its customized messages to users (notifications of conversion issues and suggestions for work-arounds) either before the body text of a message, or after. The option is set by a boolean parameter in the `<root>` node of the Mail Connector's configuration file (*configuration.xml*). To set this feature to append its messages to the message body text (add them at the end):

- 1 Use an XML editor to open the active configuration file.
- 2 Find the `<appendcustommessages>` parameter in the `<root>` node of the CMN Configuration file and change its value to *true*:

```
<appendcustommessages>true</appendcustommessages>
```

- 3 **Close** and **Save** the configuration file under the same filename.

By default (`<appendcustommessages>false</appendcustommessages>`) the Mail Connector will *prepend* its messages to the message body (insert them before).

Specify message types to be processed as active mail (optional)

CMN's `<activemailed>` parameter in the Mail Connector *Configuration.xml* file specifies the types of messages that CMN will detect and process as Notes active mail. The most common choices for this configuration setting are set in the Management Console, but some can be set only by manually editing the Mail Connector *Configuration.xml* file, where the default value appears as the single word *Default*, like this:

```
<activemailed>Default</activemailed>
```

The *Default* parameter value is shorthand for a list of these six message types: *EncryptedMail*, *Forms*, *HotSpots*, *NotesRichMarkup*, *MissingFormField*, *StripExtraAttachments*. These are the six message types that most admins want CMN to process as active mail. You can remove one or more of these types from the list, and/or you can add others, to suit your own needs.

The most common adjustments to the default list are the removal of *MissingFormField* (documents with no form field) and the addition of *Dropdowns* (collapsible sections)—about which more below.

To remove one or more of the *Default* types to be interpreted as active mail (but keep the others), you must replace the word *Default* with the full list (the six types listed above), and then remove from that list the type(s) you want to exclude. To add another type, add the name of the type to the list. Multiple message types included in the list are separated by commas.

The ***MissingFormField*** type is one of the types represented in the *Default* parameter value, so that CMN treats such messages as active mail by default. If you do not want CMN to process *MissingFormField* messages as active mail, you can remove the *MissingFormField* type from the `<activemailed>` parameter in the Mail Connector *Configuration.xml* file. (This parameter cannot be added or removed in the Management Console.) For example, to keep the other types represented by *Default* and remove only the *MissingFormField* type, you would replace the word *Default* with the names of the default types, but exclude *MissingFormField*, like this:

```
<activemailed>EncryptedMail, Forms, HotSpots, NotesRichMarkup,  
StripExtraAttachments</activemailed>
```

The ***Dropdowns*** type is *not* one of the *Default* types, because most admins prefer that dropdown content not be processed as active mail. If you *do* want CMN to process *Dropdowns* as active mail, however, edit the Mail Connector *Configuration.xml* file to add it to the list, as in these examples:

```
<activemailed>Default, Dropdowns</activemailed>
```

```
<activemailed>EncryptedMail, Forms, HotSpots, NotesRichMarkup, StripExtraAttachments,  
Dropdowns</activemailed>
```

(The *Dropdowns* parameter cannot be added or removed in the Management Console.)

If the Mail Connector server has an unsupported Notes client version: Ordinarily the Mail Connector processes Active Mail only for Notes client versions (on the CMN MC server) that are supported by CMN's Mail Connector. (See the system requirements, documented in the RTM *Release Notes*, for a list of the supported Notes client versions.) However, you can force the Mail Connector to ignore the Notes client version. This is an option that cannot be set or changed in the Management Console, but can be set in the Mail Connector *Configuration.xml* file by adding a comma followed by the string *IgnoreNotesClientVersion*. For example:

```
<activemailed>Default, IgnoreNotesClientVersion</activemailed>
```



CAUTION: Active Mail may be rendered incorrectly and may not function as expected when the Notes client on the Mail Connector server is an unsupported version. The *IgnoreNotesClientVersion* setting may result in unexpected behavior when running with an unsupported Notes client version. *Quest therefore strongly recommends* that you install a supported version of the Notes client rather than utilize this setting. If this is not feasible and the setting must be used, closely monitor the processed Active Mail and system behavior to verify the results are acceptable for your organization.

Option to strip "square" brackets from domain names in MIME (optional)

CMN's Mail Connector can be configured to check all email addresses in MIME headers, and remove any "square" brackets ("[" and "]") found enclosing a non-IP address domain name. Enabling this feature also strips square brackets in ICAL data within messages sent from Notes to Exchange.

To enable this feature, edit the Mail Connector *Configuration.xml* file to set this boolean parameter value (in the <root> node) to true:

```
<stripdomainbrackets>true</stripdomainbrackets>
```

The feature is off (*false*) by default.

Option to "hard"-bounce undeliverable "friendly"-bounce messages (optional)

The Mail Connector can be configured to "hard"-bounce a message if it is unable to deliver its usual "friendly" bounce, rather than not notify the sender at all. The option is enabled or disabled by a boolean program parameter in the <root> node of the Mail Connector *Configuration.xml* file:

```
<hardbouncenfriendlybouncefailure>true</hardbouncenfriendlybouncefailure>
```

The true setting enables the feature. By default, the feature is disabled (*false*).

Configure CMN logging (optional)

By default, CMN is installed with the log4net utility to generate log files of CMN components' system activity. This information is critical to diagnosing any configuration issues that may arise. Logging is enabled by default for all CMN components.

The default configurations will be suitable for most organizations and circumstances, but you can customize logging features. The log4net utility may be configured to work a particular way with each CMN component. Configuration instructions are nearly identical for all components, so we present the instructions separately, in Appendix C of the *CMN User Guide*.

Step 5: Start the Mail Connector

Be sure to prepare the CMN Mail Connector configuration and verify your settings for CMN logging (optional) before starting the CMN Mail Connector.

i | **IMPORTANT:** The CMN Mail Connector uses port 25, so verify no other mail servers or virus scanners are using port 25 on the CMN server.

The CMN Mail Connector typically runs as a Windows service for long-term, continuous operation. However, it can also be run as a console application—usually for shorter-term uses, as in testing and diagnostics. In the event of a system reboot, the Mail Connector running as a Windows service would automatically restart. But when running as a console app, it will require a manual restart after a system reboot.

To start the Mail Connector as a Windows service:

- Use the Windows Service Control Manager.

i | **NOTE:** The CMN Installer configures Windows to automatically start the Mail Connector Windows service upon Windows start-up.

To start the Mail Connector as a console application:

- Use Windows Explorer or a command prompt to find and run *CMNConsoleApp.exe*.

Multiple instances of CMN's Mail Connector **cannot** run concurrently on a single workstation, because they would both require the same port.

To stop the Mail Connector as a Windows service:

- Use the Windows Service Control Manager.

To stop the Mail Connector as a console application:

- Press **Esc** from the console window.

The Mail Connector can also be started and stopped (as a Windows service) in the CMN Directory Connector Management Console, in the **Common | Services** screen.

Optional "pass-through" mode

CMN offers an optional "pass-through" mode that disengages CMN's message- processing features while CMN continues to pass mail between the servers. This feature is off by default, but can be enabled by setting the `<DisableProcessing>` boolean parameter value to **true** in the CMN configuration XML file. The parameter can only be set manually.

If left undefined, the pass-through feature defaults to **false** (the pass-through mode is disabled, so CMN processes messages normally).

To enable or disable the CMN pass-through mode:

- 1 Use an XML editor to open your active CMN configuration file.
- 2 In the configuration file, add this line in the `<root>` node, or change its true/false value:

```
<DisableProcessing>false</DisableProcessing>
```

- 3 Save the configuration file.

Step 6: Reconfigure mail servers for CMN



IMPORTANT: These server reconfigurations should occur only **after** the CMN service is started. Reconfiguring the mail servers before starting CMN would at least briefly send mail to a nonexistent destination.

The CMN Mail Connector runs in conjunction with one or more Lotus Domino and Microsoft Exchange servers, or with a local Domino server and a hosted Exchange environment. As such, the Domino and Exchange environments must be configured to recognize and route messages via CMN.

6a: Configure Domino environment for CMN

For the Domino Server to work with CMN, it must direct Exchange-bound mail to CMN for processing. If you want to use CMN's Mail Connector for active mail remediation, you must also configure Domino and Notes as described below.

If using subdomains: Set *Forwarding Address* to *user@subdomain@notesdomain*

A subdomain routing method may introduce a risk that the assigned subdomain names will escape your organization's internal communications, which in turn can cause bounce-backs on replies to those addresses. To prevent this problem, set the Notes *Forwarding Address* attribute to *user@subdomain@notesdomain*, which causes Domino to set the reply address for external email to the user's primary SMTP address (internet address field value).

Send Exchange-bound mail to CMN

In the Domino Administrator, *Configuration* tab | **Messaging** section | **Domains** document | **Foreign SMTP Domain**: Change the destination server to the IP for CMN. Use MX priority designations for load balancing.

Configure Domino and Notes for active mail features

CMN's active mail features require that the Domino server be configured as described here (beginning in the Domino Administrator):

- 1 Click the *Configuration* tab, then click **Server**, then **Configurations**.
- 2 Select the server from the list, and click **Edit Configuration**.
- 3 Click the *MIME* tab.
- 4 Click the *Conversion Options* tab, and then the *Outbound* tab.
- 5 Set the **Message content** field to: *Create multi-part alternative including conversion and encapsulation*.

Some environments function correctly with only the Domino server configuration described above. But others, depending on the location of the message conversion and other environmental factors, may also require updating the Notes client configuration.

If Outlook recipients do not receive active mail attachments: Confirm the proper conversions within Notes (.OND attachments). Typically this occurs on the Domino server, but you can use this procedure to force the Notes client conversion as well. To configure Notes clients for active mail features, beginning in the Domino Administrator:

- 1 Click the *Configuration* tab.
- 2 In the **Tools** sidebar at right: Select **Policies**, and then **Create**.
- 3 In the *Create New Policy* dialog box: Click the **Settings** radio button, then select *Desktop* from the drop-down list box, click **OK**, and enter a name for the new policy on the *Basics* tab.
- 4 In the **Desktop Settings** screen: Click the *Mail* tab.
- 5 Under **MIME Settings**: In the drop-down list for **Format for messages to internet addresses which cannot be found when message is sent**, select *Notes Rich Text format*. Then click **Save & Close**.
- 6 Back in the *Configuration* tab, under **Tools | Policies** in the navigation sidebar at right: Select **Create**.
- 7 In the *Create New Policy* dialog box: Click the **Settings** radio button, then select *Security* from the drop-down list box, click **OK**, and name the new policy on the *Basics* tab.
- 8 In **Security Settings**: Click the *Execution Control List* tab.
- 9 Change the **Update Frequency** to your preference, either *Once daily* or *When Admin ECL Changes*. Then click **Save** and **Close**.
- 10 Create a policy document that will push out the workstation updates:
 - a In Domino Administrator: Click the *Configuration* tab.
 - b In the navigation sidebar at right: Select **Tools | Policies**, and then **Create**.
 - c In the *Create New Policy* dialog box: Click the **Policy** radio button, click **OK**, and name the new policy on the *Basics* tab.
 - d Under **Basics**, set **Policy type** to your preference, either *Organizational* or *Explicit Users*. (**Note:** *If using Explicit Users, the Policy must be assigned in the person document for each appropriate user.*)
 - e In the *Setting Type/Setting Name* section, set the **Desktop** and **Security** fields to the Desktop and Security policy you've created.
 - f Click **Save & Close**.
- 11 Each Notes client must be restarted for these changes to take effect.

CMN active mail with MIME format for outbound Internet mail

If you want to use CMN's active mail features (which require Rich Text outbound format), but want your outbound Internet mail to be sent in MIME format, you can route Notes' Internet-bound mail through CMN into Exchange and then let Exchange handle delivery to the internet. By this method, CMN will strip the extra attachments before relaying messages to Exchange, and then the Exchange MTA will handle delivery. This strategy works with either single- namespace or multi-domain mail routing (see [Coexistence mail routing basics](#) earlier in this chapter).

Another option is to designate a Domino server to be used for routing only, with no users assigned to it. *This method, however, will work only with multi-domain mail routing.* To configure a Domino server for MIME-format outbound Internet mail while CMN active mail features are enabled:

- 1 Identify or create the "routing-only" Domain server.
- 2 For this server: Create a *Server Configuration* document and enable Notes encapsulation on the *Outbound MIME* tab.
- 3 In the Domino Administrator: Click the *Configuration* tab and then expand the **Messaging** section.
- 4 Choose **Domains**, and then click **Add Domain**.
- 5 On the *Basics* tab, complete the **Domain type** field with the **Foreign SMTP Domain**.
- 6 Click the *Routing* tab, complete these fields, and click **Save & Close**:
 - **Messages Addressed to — Exchange SMTP Domain:** The name of the Exchange SMTP domain to which this document applies. For example: exchange.company.com
 - **Should be Routed to — Domain name:** A fictitious, logical domain name (for example, *CMNDom*) to which messages that match the pattern in the **Internet Domain** field will be routed. The name you specify serves as a placeholder only; Domino uses the name to pair the **Foreign SMTP Domain** document with the connection document you will create below.
- 7 In the Domino Administrator: Click the *Configuration* tab and then expand the **Messaging** section.
- 8 Choose **Connections**, and click **Add Connection**.
- 9 On the *Basics* tab, complete these fields, and then save the document:
 - **Connection type:** SMTP
 - **Source server:** Name of the newly created Domino server where other Domino servers will route mail bound for Exchange via CMN.
 - **Connect via:** Direct connection—for servers that communicate over LAN connections.
 - **Destination server:** Unique fictitious placeholder name—for example, *CMNServer*. Domino does not use the value in this field, but the Connection document will not work if the field is empty. The name you specify must **not** match the name of any server on the network.
 - **Destination domain:** Fictitious, logical domain name specified in the **Internet Domain name** field of the corresponding Foreign SMTP domain document (*CMNDom* in the earlier example).
 - **SMTP MTA relay host:** IP address or DNS name of the CMN server, to which the source server transfers outbound mail.
- 10 On the *Replication/Routing* tab, complete these fields:
 - **Replication task:** Disabled.
 - **Routine task:** Choose *Mail Routing*. There is no need to specify SMTP routing, since the same routing task is responsible for transferring messages over NRPC and SMTP. The source server must have SMTP routing enabled in its Server document; otherwise, the Router discards the information in the SMTP Connection document.
 - **Route at once if:** Number of pending messages that will force routing. The default is 5.
- 11 On the *Schedule* tab, specify the desired routing schedule.
- 12 Click **Save & Close**.
- 13 Replicate the Domino Directory to all servers in the Domino domain.

The change takes effect after the next Router configuration update. To put the new setting into effect immediately, recalculate the routing tables on all affected servers.

6b: Configure Exchange server for CMN

In the **Organization Configuration** | **Hub Transport** | *Send Connector* tab | **Domino Send Connector Properties** | *Network* tab: Add the IP or the FQDN for CMN as a "smart host" through which to route mail. You may use MX priority designations for load balancing.

If necessary: verify Exchange DL configuration

If you have already verified the configuration of your Exchange distribution lists while setting up the CMN Directory Connector (in chapter 2), just skip ahead to the next step below. Otherwise:

Check the *Message Delivery Restrictions* settings for any Exchange group to which you want Notes users to be able to send messages. Any such Exchange group must be of the *universal distribution* type to be mail-enabled. To change the settings, beginning in the Exchange Management Console:

- 1 Select the group under **Recipient Configuration | Distribution Group**, then double-click the group you want to edit.
- 2 Click the *Mail Flow Settings* tab, and highlight **Message Delivery Restrictions**, then click **Properties** above.
- 3 De-select (unmark) the check box for **Require that all senders are authenticated**.
- 4 **Save**, and then restart the MS Exchange transport service.

Step 7 (optional): Configure TLS/SSL encryption

CMN's Mail Connector supports the TLS encryption protocol (SSL 3.1). TLS support requires a valid server certificate, which must be installed on the CMN server, and selected in CMN's Mail Connector Management Console. A new screen has been added to the MC Management Console for this purpose. The Notes and Exchange servers must also be configured for TLS/SSL support.

To enable and configure TLS/SSL encryption with CMN's Mail Connector:

- 1 Obtain and install a Domino server security certificate.

If you already have a valid certificate for some other security function (for example, for CMN's Free/Busy Connector), you can use the same certificate to enable TLS in the Mail Connector (and skip ahead to step 2 below). Otherwise, you will need an SSL certificate on a keyring file. This keyring file is exactly the same as one used for other web security functions such as secure web access, and can be obtained the same way.

You can obtain a certificate from a reputable Certification Authority (CA), or you can generate your own self-signed certificate. Your Domino documentation describes both approaches. Here we simply summarize how to accomplish this with a self-signed certificate:

- a In Domino Administrator: Open the *Server Certificate Administration* database on your server (typically *certsrv.nsf*), or create one from the template if none exists.
- b Choose the option to **Create Key Ring with Self-Certified Certificate**, and enter the appropriate field values:
 - **Key Ring File Name:** Choose *selfcert.kyr* in the Domino root data directory.
 - **Common Name:** The fully qualified host name of your Domino server—for example, *domino.company.com*.
 - **Organization:** Should match the corresponding entry in your domain registration.
 - **State or Province:** In the U.S. this is the two-letter postal abbreviation for your state. Elsewhere, enter the name of the region, province, etc.
 - **Country:** The two-character country code.
- c Click the **Create Key Ring with Self-Certified Certificate** button.
- d Under **Server Configuration:** Choose the *Current Server Document*, and select the *Ports* tab.
- e On the *Ports* tab: Select the *Internet Ports* tab, and enter the appropriate field values:
 - **SSL Settings:** Set the SSL key file name to *selfcert.kyr* in the Domino root data directory.
 - **SSL Protocol Version:** *Negotiated*

- **Accept SSL site certificates:** Yes
 - **Accept expired SSL certificates:** No
 - f Under **Web**: Enable HTTPS and ensure it is set to 443. (With HTTPS enabled, your browser will be able to retrieve the public key and install it into the cert store.)
 - g Restart Domino.
 - h Test the certificate: On the CMN client computer, point IE to *https://domino.company.com* (IE should render the page without errors).
- 2 In CMN's Mail Connector Management Console, on the new *TLS Settings* screen:
- a Click the **Enable TLS** radio button.
 - b In the **Certificate Store** drop-down list, select the location in your network where the certificate resides. If the certificate location does not appear in the list, you must copy the certificate to one of the listed locations, using the Microsoft Certificates Management Console, into a LOCAL-SYSTEM account (not a personal account).
- The table on the bottom half of the screen then shows a list of all certificates found in the designated Certificate Store, with the *Issuer*, the *Effective* and *Expiration Dates*, and the certificate *Thumbprint*.
- c In the table, select the certificate you want to install.
 - d Remember to **Save Configuration** (on the **File** menu).
- 3 Configure the Domino Server to enable TLS encryption. (Remember that Domino does not support TLS-level encryption. An attempt to enable TLS on a Domino server will not generate an error, but Domino will negotiate the encryption level down to SSL3.) In Domino Administrator:
- a In the left-hand navigation tree, select **Server|Configurations**. Then select the server in the list (at the right), and click **Edit Configuration**.
 - b In the Configuration Settings for the selected server, select the *Router/SMTP* tab, then the *Advanced...* tab, and then the *Commands and Extensions* tab.
 - c Set the **SSL negotiated over TCP/IP** port field to either *Enabled* or *Required*. This is an important distinction:
 - **Required:** Prevents Domino's receipt of non-TLS messages. (The Required setting disallows non-TLS encrypted messages, which CMN might otherwise transmit if a configuration issue prevents CMN from sending a TLS-encrypted message, in which case it would attempt to send the message as plain text.)
 - **Enabled:** Permits TLS-encrypted messages but does not prevent non-TLS messages.

Even if your server uses Internet Site documents, you must go to the *Basics* tab and temporarily set *Load Internet Configurations From Server/Internet Sites Documents* to **Disabled**. You do not need to save the server document in this state, but disabling Internet Site Documents exposes a form on the *Ports/Internet Ports* tab.
 - d Select the *Ports/Internet Ports* tab.
- Each type of Internet Site has individual settings for SSL on an *Internet Site* document, but outbound mail routing via SMTP does not. This is where you specify what keyring to use for outbound SMTP TLS. Enter the name of your new keyring file there, then go back to the *Basics* tab and re-enable *Internet Sites* if needed. When you go back to the *Ports/Internet Ports* tab, you will see that the SSL settings portion of the form has been hidden.
- e Set **Mail (SMTP Inbound)** and **Mail (SMTP Outbound)**:
- | | |
|--|--|
| <p>SMTP Inbound:</p> <ul style="list-style-type: none"> • <i>TCP/IP port number:</i> 25 • <i>TCP/IP port status:</i> Enabled • <i>Enforce server access settings:</i> No • <i>SSL port number:</i> 465 • <i>SSL port status:</i> Enabled | <p>SMTP Outbound:</p> <ul style="list-style-type: none"> • <i>TCP/IP port number:</i> 25 • <i>TCP/IP port status:</i> Negotiated SSL • <i>Enforce server access settings:</i> N/A • <i>SSL port number:</i> 465 • <i>SSL port status:</i> Disabled |
|--|--|

If you are not using *Internet Site* documents: Click **Save and Close**, and restart the Domino server. This step 3 procedure is now complete (skip substeps f and g, and resume at step 4).

If you are using *Internet Site* documents, continue with step f below.

- f Open the inbound *SMTP Site* document and configure the *Security* tab as follows.

TCP Authentication:

- *Anonymous*: Yes
- *Name & password*: No

SSL Authentication:

- *Anonymous*: Yes
- *Name & password*: No

SSL Options:

- *Key ring file name*: keyfile.kyr
- *Protocol version*: Negotiated
- *Accept SSL site certificates*: No
- *Accept expired SSL certificates*: Yes
- *Check for CRLs*: No
- *Trust expired CRLs*: Yes
- *Allow CRL search to fail*: Yes

Make sure that the *Key ring file name* value is correct. If you plan to use authentication, enable the *Name & Password* options. Otherwise, leave them disabled.

- g Click **Save and Close**, and restart the Domino server.

- 4 Configure the Exchange server to require TLS encryption for the receive connector. You can do this either by PowerShell commands or by settings in the Exchange Management Console:

- To enable TLS encryption for the Exchange receive connector by PowerShell:

```
get-receiveconnector | set-receiveconnector -requiretls $true
```

—OR—

- To enable TLS encryption for the Exchange receive connector in the Exchange Management Console:

In **Server Configuration | Hub Transport | Properties | Authentication**: Mark the checkbox for **Transport Layer Security (TLS)**, and also the checkbox for either **Externally Secured** (for the default receive connector) or **Integrated Windows Authentication** (for a client receive connector).

After either method: Restart the Exchange Transport Service.

(To disable TLS encryption for the receive connector by PowerShell, enter the same command substituting *\$false* for *\$true*. To disable it in the Exchange Management Console, unmark the same checkboxes.)

- 5 Configure the Exchange server to require TLS encryption for the send connector. You can enable/disable TLS encryption for the send connector by PowerShell commands only:

To enable: `get-sendconnector | set-sendconnector -requiretls $true`

To disable: `get-sendconnector | set-sendconnector -requiretls $false`

And then restart the Exchange Transport Service.

- 6 Verify that STARTTLS is enabled on the Exchange server (and enable it if necessary):

- a From the CMN client computer, telnet to the Exchange server on port 25, and send 'EHLO'. If the Exchange reply includes *250-STARTTLS*, then STARTTLS is already enabled (skip ahead to step 7).

- b If STARTTLS is *not* already enabled, enable it with this command:

```
Enable-ExchangeCertificate -thumbprint <thumbprint of certificate> -services:SMTP
```

And then restart the Exchange server.

- 7 Check the CMN log to verify that TLS is enabled and working properly. In the detailed log entries you should see an entry like this:

Secured connection from CMN to Destination Exchange server: Cipher Algorithm: Rc4 - Cipher Strength: 128 - Is Authenticated: True - Is Encrypted: True - Is Mutually Authenticated: False - Key Exchange Algorithm: RsaKeyX - Key Exchange Strength: 2048 - Protocol: Tls

Step 8 (optional): Have an administrator sign the *CMN.ntf* template file

If your organization uses active mail and you do not sign the *CMN.ntf* file, an Exchange user opening an active mail message will have to dismiss a popup dialog box to verify that he/she trusts the unsigned database. To permanently bypass that step, have an administrator sign the *CMN.ntf* template file:

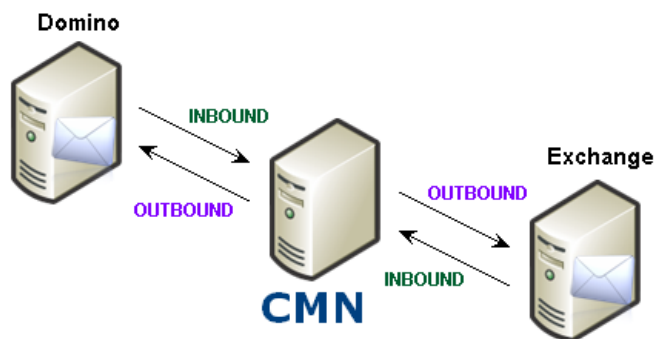
- 1 Copy the *CMN.ntf* template file from your CMN Mail Connector directory to the Domino server.
- 2 Have an administrator sign the *CMN.ntf* template file.
- 3 Copy the signed *CMN.ntf* template file to the CMN server running the Mail Connector component.
- 4 Select the signed *CMN.ntf* template file in the CMN Mail Connector Management Console, on the *Active Mail* screen, with the **Browse (...)** button.

Mail Connector Management Console

CMN includes a Management Console for the Mail Connector to assist in updating the component in a series of friendly, helpful GUI screens. The Management Console then edits the Mail Connector's configuration file according to your entries in the GUI screens.

The next few sections explain the basic operating principles of the Mail Connector Management Console, and provide screen-by-screen field notes.

All configuration settings in the CMN Management Console screens correspond to parameters stored in the CMN .xml configuration file. The Management Console provides an easier, "friendlier" way to enter and change those settings.



Note: The terms "Inbound" and "Outbound" as used here are relative to the Mail Connector itself, as shown in this illustration. An "Inbound" server is one *from* which CMN receives messages, and an "Outbound" server is one *to* which CMN relays messages.

Management Console screen: Mail Connector | Inbound Servers

The **Inbound** settings define the valid Domino and Exchange servers whose message traffic the Mail Connector will accept.

A checkbox appears near the top of the screen, above the Servers table:

- **Enable hosted Exchange** (if connecting with a remote "hosted" Exchange server): Tells CMN to accept transmissions from a server not defined in the table below, and to assume that the undefined server is a hosted Exchange server.

All other (non-hosted) servers are defined in the table, where each row defines one server. You must specify at least one **Inbound** server each for Exchange and Domino. However, you may specify two or more for either or both. Click **Add** to define a new server in the table, select an existing server and click **Edit** to change its configuration, or click **Remove** to delete a server from the table.

Each server is defined by values in these columns:

- **System Type:** Select **Microsoft Exchange** or **Lotus Domino** (with the version number of Domino installed on this server).
- **Server Name / IP Address:** The name of the server, which may be designated as the DNS name of the physical box, or by the IP address associated with the server, or by its MX record notation, which can rank physical server names by a priority usage preference.

Management Console screen: Mail Connector | Outbound Servers

The **Outbound** settings define the valid Exchange and Domino mail servers to which the Mail Connector will try to route mail. You may specify two or more servers for either or both sides—in which case CMN will distribute the outbound traffic among all of the servers defined for any single side (Exchange or Domino) in round-robin fashion.

The servers are defined in a table, where each row defines a single server. You must specify at least one server for each of Exchange and Domino. Click **Add** to define a new server in the table, select an existing server and click **Edit** to change its configuration, or click **Remove** to delete a server from the table.

Each server is defined by values in these columns:

- **System Type:** Select **Microsoft Exchange** or **Lotus Domino**.

The **System Type** drop-down list for a Notes outbound server offers an assortment of Domino versions. Your selection here determines how CMN will process certain message types for delivery to that server. (Remember that Notes implements some features differently in different versions, so CMN processes messages differently to accommodate those differences. Your **System Type** designation here tells CMN how to process messages bound for this server.)



NOTE: If defining a remote "hosted" Exchange outbound server: Select the **Microsoft Exchange** value here.

- **Server Name / IP Address:** The name of the server, which may be designated as the DNS name of the physical box, by the IP address associated with the server, or by MX record notation.



NOTE: If defining a remote "hosted" Exchange outbound server: Enter the SMTP MTA for the **Server Name / IP Address**. You should be able to find the correct value in the admin interface of your hosted provider or by contacting the provider directly.

Management Console screen: Mail Connector | Notes Doc Links

Specify how CMN's Mail Connector should handle Notes DocLinks. Select one of the radio-button options.

- **HTML Links to your Domino webserver:** A DocLink converted to an HTML link will not require the Notes client on the user's desktop, and will instead open into a web browser if iNotes is enabled.
 - **Site Address:** The URL for the Domino web server.
- **HTML links to your SharePoint server (requires Notes Migrator for SharePoint):** This option requires that you have Notes Migrator for SharePoint. If you select this option, you must also specify:
 - **Site Address:** The URL for the SharePoint server.

The example link (*https://serveraddress/_layouts/linktracking.aspx*) shown in the screen will direct users to Notes for the corresponding data until it is migrated to SharePoint. After migration, the LinkTracking Service will automatically redirect users to the migrated content in SharePoint.

- **Notes NDL links (requires Notes client on Outlook users' workstations to use):** This standard DocLink format will work only if the Notes client is installed and running on the user's desktop.
- **Convert to NDL Attachment (Requires Notes client on users' workstations to use):** Select this option to replace Notes link with NDL attachments.

Management Console screen: Mail Connector | Network Settings

The settings on this screen control how the Mail Connector will process message traffic and how to maximize processing performance:

- **Port Number to Listen On:** The SMTP port that CMN will monitor. The default is 25, but you may specify any port from 1–65535.
- **Performance Tuning:**
 - **Maximum Connections:** Number of simultaneous open channels CMN will allow. Default=600.
 - **Maximum Processing Threads:** Maximum number of threads CMN will use to process message bodies. Default=16. In most environments, this setting should be set to 4x the number of CPU cores.

Management Console screen: Mail Connector | TLS Settings

The settings on this screen let you configure the Mail Connector to support transport-layer security (TLS) encryption when communicating with inbound and outbound servers:

- **Disable TLS vs. Enable TLS:** Select the appropriate radio button to indicate your choice.
- **Certificate Store:** From the drop-down list, select the location in your network where the certificate resides. If the certificate location does not appear in the list, you must copy the certificate to one of the listed locations using the Microsoft Certificates Management Console, into a *LOCAL-SYSTEM* account (not a personal account).
- The **Choose Certificate** table on the bottom half of the screen then shows a list of all certificates found in the designated **Certificate Store**, with the *Issuer*, the *Effective* and *Expiration Dates*, and the certificate *Thumbprint*.
In the **Choose Certificate** table, select the certificate you want to install.
- **Disable SSL v2:** This checkbox offers the option to disable SSLv2 encryption to permit connections to Domino servers that don't support SSLv2 (for example, patched Domino 9.0.1 servers). See [this Lotus article](#) for more information.

Remember to **Save Configuration** (on the **File** menu) for any changes here to take effect.

Management Console screen: Mail Connector | Advanced Message Settings

Advanced Message Settings are performance-tuning features:

- **Send Keep-Alives During Processing:** CMN's Mail Connector is configured to send an SMTP NOOP every 30 seconds, to keep the server from timing out when processing larger messages. You can disable and enable this feature by the checkbox here, and/or set the time interval to some other value:
 - **Send Keep-Alive Message Every __ Seconds:** Number of seconds CMN will wait before sending the first NOOP and each successive NOOP (if *Send Keep-Alives* is enabled). Default=30.
- **Response Message Mail From Address:** The return address that the Mail Connector will insert into the *From* field of its email notifications to end users—e.g., in a "friendly bounce" to notify a sender that some uncorrectable incompatibility between Notes and Exchange prevents the completion of whatever the sender intended.

Performance Tuning:

- **Maximum Message Process Time:** Maximum time (in minutes) that CMN will spend processing a message before reporting a failure. Default = 4 minutes.

- **Message Connection Inactivity Time:** Maximum time (in seconds) that CMN will wait for a mail system to transmit a message, or acknowledge a transmission from CMN, before abandoning the attempt and reporting a failure in the log. Valid range = 1–600 seconds (inclusive), default = 30.
- **Maximum Memory Usage Per Message:** Maximum memory (in KB) that CMN will allocate for each message, before redirecting to a temporary file on the hard drive. (Without the limit, a single very large message could occupy a large portion of system memory, slowing performance.) The valid range for the setting is 0–64 K (inclusive), default = 32. A setting of 0 tells CMN to always use disk files.
 - **Temporary File Directory:** The directory to which CMN will write temporary files associated with the **Maximum Memory Usage** setting above. The Mail Connector will use the Windows TEMP directory by default (if left unspecified), or you can use the **Browse** button ([...]) to find and specify some other directory. To reset the value to the Windows TEMP default, click **Use Windows Default**.

Management Console screen: Mail Connector | Address Rewriting

This screen lets you configure the Mail Connector to detect certain formats of user names and addresses in message traffic, and automatically convert them to other forms. Select any number and combination of checkboxes (or none) to enable the features you want to use.

[] Rewrite Notes Addresses: Mark this checkbox if you want the Mail Connector to strip sub-domain addresses and leave just the single-domain addresses. If you enable this feature, you must also specify:

- **Internet Domains:** Enter one or more domains, separated by commas. For example, specify the **Internet Domain** *internetdomain.com* for the Mail Connector to replace *jsmith@server.internetdomain.com* with *jsmith@internetdomain.com*.

[] Rewrite Notes Common Names: Mark this checkbox if you want the Mail Connector to convert Notes-style common names in calendar items to a "friendlier" form—for example, to convert *John Smith/domain1/domain2* to *John Smith*.

[] Remove 'Friendly Names' from Exchange to Domino Messages: Mark this checkbox if you want the Mail Connector to replace "friendly" (display) Exchange email addresses with SMTP addresses in messages sent from Exchange to Domino.

Management Console screen: Mail Connector | Message Content Limits

These limits let CMN enforce certain compatibilities between the Notes and Exchange environments.

Maximum Subject Line Length: The longest message *Subject* line CMN will permit, in number of characters. If a *Subject* line exceeds this length, the Mail Connector will truncate the line and insert ellipsis (...). The default of 1975 is the maximum allowed by a local Microsoft Exchange, and should be plenty in most local-Exchange environments. But if coexisting with Office 365, this limit should be set much lower, to 255.

Maximum Number of MIME Parts: The maximum number of MIME bodies CMN will allow in multipart messages. CMN will bounce a message with more than this number of MIME bodies. The default limit of 5000 is very high. But if coexisting with Office 365, this limit should be lowered to 250.

Management Console screen: Mail Connector | Active Mail



NOTE: Active mail processing requires a Notes client on the Exchange recipient's workstation, which must connect to a Lotus Domino server.

NOTE: Verify any shared resources that will be referenced by Notes active mail content are included in the *CMN.ntf* template file. Active mail content that references shared resources not included in *CMN.ntf* will appear to an Exchange recipient as a database with empty cells or other missing parts.

This screen lets you configure the Mail Connector for the types of active content it should process, how to handle active-mail attachments, and the name of the input template file.

- **Active Mail Processing Performed:** Mark any number and any combination of checkboxes to indicate the types of active content you want CMN to process:

<input type="checkbox"/> Process Encrypted Mail	<input type="checkbox"/> Process Hot Spots
<input type="checkbox"/> Process Forms	<input type="checkbox"/> Process Notes Rich Markup
- **NOTE:** CMN supports certificate-style encryption and decryption methods, but does not support the TLS method of SMTP encryption.
- **NOTE:** Decryption of Notes-encrypted mail requires a valid Notes certificate on the Exchange recipient's workstation.
- **Attachment Options:** Mark either, neither or both checkboxes to indicate how CMN should handle active-mail attachments:
 - **Send Notes Alternative Text to Recipients:** Determines whether CMN will retain and send any in-line attached HTML and/or plain-text renderings of active-mail content.
 - **Strip Extra Notes Attachments:** Determines whether CMN will remove any extra attached plain-text renderings of active-mail content.
- **Attachment Name:** Enter the filename you want CMN to assign to active-mail attachment files.
- **Input Template File:** Use the **Browse** button ([...]) to specify the path (including filename) of the CMN template file. This file provides the information necessary for CMN to properly process the Notes .OND attachment and produce the active-mail attachment file. The default is set to *CMN.ntf*.

Management Console screen: Mail Connector | Notification Messages

You can customize the notices CMN inserts to notify recipients of conversion issues, which may include suggestions to compensate for known limitations. For example, a message may suggest that the recipient manually update his/her calendar, or verify that a particular appointment has been added.

All of the notification message information is saved in a separate .xml file, which you must specify as the:

- **Messages File:** The path (including filename) of the .xml file containing the CMN notification messages. The other values on this screen are saved in the file you specify here, and the CMN Mail Connector pulls your preferred message from this file.

IMPORTANT: Any new information or changes entered in this screen will be saved to the **Messages File** only when you save the configuration file—by selecting **Save Configuration File** on the **File** menu. If you exit the Management Console without saving the configuration, any new information or changes entered in this screen (or any other screen) will be lost.

To view or customize notification messages:

Repeat this process for as many message types as you want to customize.

- 1 In the folder tree to the left of the **Description**, **Plain Text Message** and **HTML Message** fields, select the message you want to view or customize. When you select the message in the folder tree, the fields show the associated current values for:
 - **Description** (uneditable, FYI only): A name and/or brief description of the circumstances that would cause this message to be sent.
 - **Plain Text Message:** The message, in plain-text format, that CMN will insert into plain-text emails to notify recipients.
 - **HTML Message** (does not apply, and appears grayed-out and uneditable, for NDR-type messages and some other message types): The message, in HTML format, that CMN will insert into HTML emails to notify recipients.
 - **Delivery Action** (applies only to the *Subject* strings of *SenderResponses*, as selected in the folder tree at left): A combo box to specify how CMN will handle the selected *SenderResponse*:

- *Hard Bounce Message (NDR)*: CMN rejects the message, and the sending server determines what to do.
- *Insert Instructional Text for Recipient*: CMN inserts a text string (as specified above, typically instructions) into the message it relays to the recipient, and the sender is **not** notified. **Note**: CMN will ignore this *Insert Instructional Text* option for these message types that require a *Soft Bounce*:
 - UnableToRescheduleSeriesWithExceptions
 - UnableToReschedulePartOfSeries
 - UnableToRescheduleForResource
 - MeetingSeriesTooComplex
 - UnableToRescheduleEntireSeriesForResource
 - UnableToScheduleSeriesForResourceInNotes65
 - MeetingSeriesTooComplex
 - CalendarEncryptionNotSupported
- *Soft Bounce Message (Friendly Message to Sender)*: CMN rejects the message, and sends a notification to the sender explaining the reason.

i | **NOTE:** The **Delivery Action** can be specified only for *Subject* strings (both a *Remark* and a *Subject* can be configured for each *SenderResponse*).

- 2 To customize either or both the **Plain Text Message** and **HTML Message** fields: Click your cursor into the text box, and use familiar text-editing features to add, delete and/or edit the text box contents.

While you are editing, two buttons at the bottom of the screen let you:

- **Insert Variable...:** Calls a pop-up list of defined variables (for the date, time, message sender, etc.) from which you may select one to insert inline into the text of a **Plain Text Message** or **HTML Message** (see above). A message may, for example, cite the proposed date and time of a meeting invitation, which will vary with every instance of the message.
- **Use Default Message:** Restores the default message values into the **Plain Text** and **HTML Message** fields above. Any custom message data that may already appear in the fields will be lost.

Management Console screen: Mail Connector | Resource Mapping

Specify a .tsv file that defines the Notes resource names and associated SMTP addresses. These are associations CMN needs in order to process Exchange users' attempts to schedule Notes resources.

Note that the **Mapping File** must already exist before you can specify it in this screen. The Notes resource mapping file can be populated using the **Import from MNE** button in the Management Console or created manually, as described in step 1 of the [Configuration](#) process earlier in this chapter.

To specify the Notes resource mapping file:

- Use the **Browse** button ([...]) to locate and specify the path (including filename) of the resource mapping file you created in step 1 of the Mail Connector [Configuration](#) process.

The Management Console then displays the file path in the **Mapping File** field, and imports its data into the table below. Note that this is a read-only table; its contents cannot be edited on this screen.

CMN Free/Busy Connector

- [Free/Busy Connector overview](#)
- [FBC installation and configuration](#)
- [F/B Connector Performance Counters](#)
- [F/B Connector Management Console](#)

Free/Busy Connector overview

The Notes and Exchange environments implement calendar free/busy queries differently, so by themselves cannot read the availability of users on the other system. For full calendar functionality, the calendar applications on both sides need some way to determine the availability of users within the other environment.

CMN's Free/Busy Connector ("FBC," or "F/B Connector") is a coordinated set of applications that enable Exchange and Domino to query the calendar availability of each other's users. Sharing free/busy data between Notes and Exchange simplifies calendar updates when accepting a meeting invitation, or changing the day/time or canceling a meeting, or making some other change to an existing meeting or recurring meeting series.

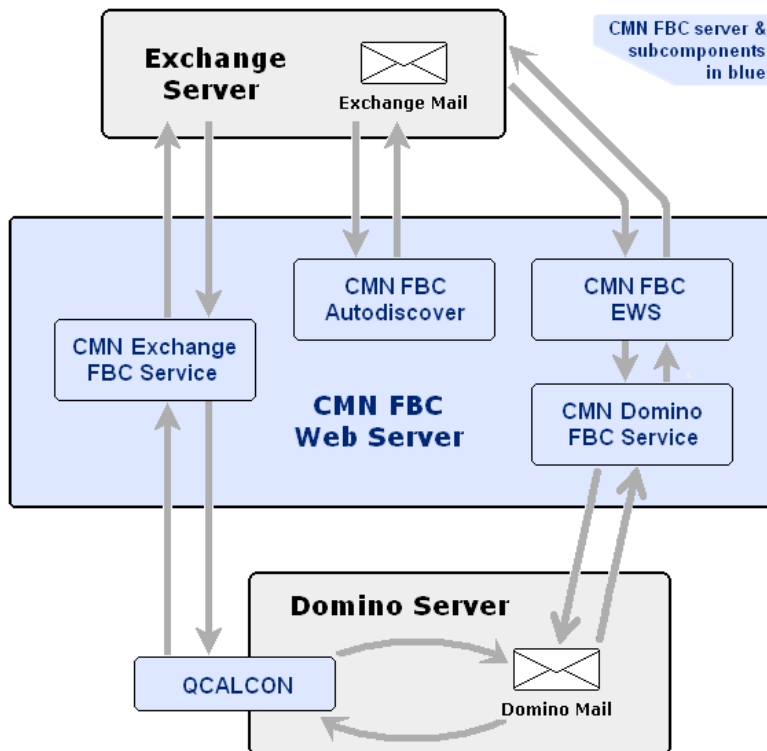
When a user in one environment requests free/busy information about a user in the other environment, the asking server's query must be translated into a form that the other server will understand. Likewise, the data reply has to be translated into a form that the asking server will understand. This is true of free/busy queries and replies in both directions, and a separate translation application is required for each direction.

i **NOTE:** Free/Busy queries to Notes resources cannot be forwarded to Exchange, but you can accomplish the same functionality by replacing the Notes resources with contacts that are named for the resources they represent.

In addition to the query, translation and reply functions, both the Exchange and Domino servers require a service to facilitate data communications between themselves and external data sources (e.g., each other). Exchange uses Exchange Web Service (EWS) for communications between Exchange and other applications, while Domino requires a server task. And finally, Exchange also uses an *Autodiscover* service to track and report the location (URL) of the EWS.

In typical configurations, CMN's bidirectional Free/Busy Connector contains five subcomponents to facilitate the flow of F/B queries and replies between Exchange and Domino:

- **Free/Busy Autodiscover Web Service:** Tracks the location of the EWS (see below), reporting the EWS URL to Exchange upon each outbound F/B query (which tells Exchange where to send its query).
- **Free/Busy Connector EWS:** Facilitates communications between the Exchange and Domino servers, for transmitting Exchange F/B queries to Domino, and receiving F/B information from Domino.
- **Domino Free/Busy Connector Service:** Translates Exchange F/B queries into a form that Domino can process, and then translates F/B data (Domino's reply to a query) from Domino form into a form that Exchange can process.
- **QCalCon:** A Domino server task for communications between the Domino and Exchange servers (Exchange F/B queries to Domino, and Domino's F/B information)—performing essentially the same function for Domino that the F/B EWS performs for Exchange.
- **Exchange Free/Busy Connector Service:** Translates Domino F/B queries into a form that Exchange can process, and then translates Exchange F/B data (reply to a query) into a form that Domino can process.



For technical reasons, QCalCon must be installed on the Domino server. The other four F/B Connector components may reside on a single server, as shown above.

However, many production environments have sufficient query volume to warrant separate servers to ensure optimal performance. These multi-server configurations appear in the two scenario narratives described and illustrated below.

These scenarios and the accompanying illustrations show the roles these components serve within the overall scope of CMN's Free/Busy Connector.

Outlook user retrieves F/B data for a Lotus Notes user

The illustration below shows how three F/B Connector components fit into the data flow when an Outlook user requests free/busy data for a Notes user. The process described and illustrated here is for a disparate namespace or subdomains scenario, but the F/B Connector also supports a shared/single namespace with either a local proprietary Exchange or Office 365.

In this scenario: Sally (in Outlook) wants to book a meeting with Joe (in Notes). Joe's address is *joe@d-sitraka.com*. Exchange resolves *d-sitraka.com* through DNS.

DNS has a zone called *d-sitraka.com* with a host *autodiscover.d-sitraka.com*. The host name must match the common name (of the certificate you requested) where CMN is installed.

The step numbers in this simplified process narrative correspond to the circled numbers in the illustration:

- 1 The Exchange server asks the F/B Autodiscover Web Service (at <https://autodiscover.d-sitraka.com/autodiscover/autodiscover.xml>): "Where is the EWS that can relay my free/busy query to Domino?"
- 2 The F/B Autodiscover Web Service replies with the URL for CMN's F/B Connector EWS.
- 3 The Exchange server addresses its F/B query to CMN's F/B Connector EWS, at the designated URL.
- 4 The F/B Connector EWS relays the query to the Domino F/B Connector Service.

- 5 The Domino F/B Connector Service translates the Exchange query into Domino form, and passes the query to Domino. (The Domino FBC Service is configured with the Domino Server name, Directory Server name, ID path, and secure password of the Domino server.)
- 6 The Domino server accepts and processes the query, and replies with Joe's free/busy information, directed back to the Domino F/B Connector Service.
- 7 The Domino F/B Connector Service translates Joe's Domino F/B data into Exchange form, and passes the information to the EWS.
- 8 The F/B Connector EWS receives the inbound F/B data for Joe and relays it to the Exchange server, where it is passed on to Sally.

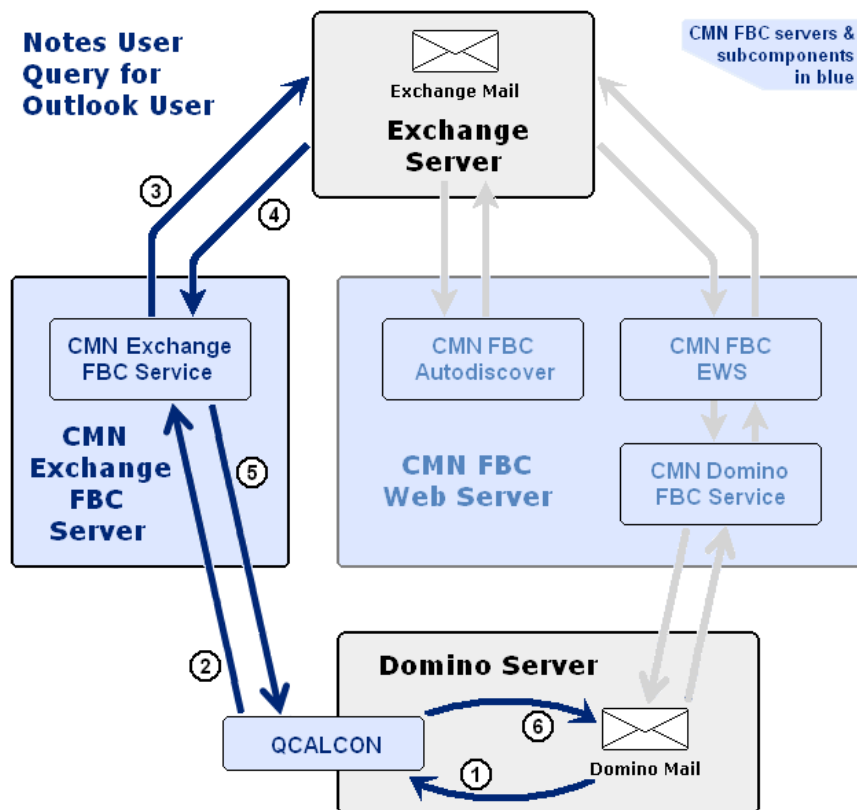
i | **NOTE:** QCalCon and the CMN Exchange FBC Service are not used at all for F/B queries and replies in this direction (Exchange query and Domino reply).

Notes user retrieves F/B data for an Outlook user

A query-and-reply in the opposite direction, Notes-to-Exchange, is basically the same, although the details vary somewhat because Domino's interface to external systems is different from Exchange's.

Again, the process described here is for a disparate namespace or subdomains scenario, but the F/B Connector also supports a shared/single namespace. And again, the step numbers in this simplified process narrative correspond to the circled numbers in the illustration below.

In this scenario, Joe (a Lotus Notes user) wants to book a meeting with Sally, an Outlook user, whose address is *sally@e-sitraka.com*:



- 1 The Domino server sends a request for Sally's free/ busy information to Domino's internal queue, where it is picked up by the F/B Connector's QCalCon server task. (QCalCon resides on the Domino server and is configured to listen for Exchange calendar queries.)

- 2 QCalCon relays the request to CMN's Exchange F/B Connector Service.
- 3 The Exchange F/B Connector Service translates the Domino query into Exchange form, and passes the query to the Exchange server.
- 4 The Exchange server accepts and processes the query, and replies with Sally's free/busy information, directed back to the Exchange Free/Busy Connector Service.
- 5 The Exchange F/B Connector Service translates Sally's Domino Free/ Busy data into Domino form, and passes the information back to the QCalCon server task.
- 6 QCalCon relays the Free/Busy information back to Domino, where it is passed on to Joe.

NOTE: CMN Domino FBC Service and the Autodiscover and EWS web services are not used at all for F/B queries and replies in this direction (for a Domino query and an Exchange reply).

FBC installation and configuration

CMN's Free/Busy Connector (FBC) supports F/B coexistence for an on-premises Exchange, or for a hybrid or non-hybrid Office 365 ("O365") scenario. For a hybrid O365 (O365 synced to an on-premises Exchange), CMN's FBC is configured between Notes/Domino and the local on-premises Exchange, and synchronization of the local Exchange to O365 is configured apart from CMN (described in Microsoft documentation).

CMN also supports F/B coexistence for either a single (shared) namespace environment (equivalent domain names) or separate (multiple) namespaces. In a single-namespace environment, equivalent domains are mapped to the primary domain in the Exchange server or Domino server.

The configuration procedures for different combinations of these factors are lengthy and complex, and therefore are documented in a separate *FBC Scenarios Guide* that accompanies the other documentation in the CMN product kit. See the *FBC Scenarios Guide* for procedures and application notes for installing and configuring CMN's Free/Busy Connector in all of these Exchange-side scenarios:

- Hybrid Office 365 with shared (single) namespace
- Hybrid Office 365 with separate namespaces
- Non-hybrid Office 365 with shared (single) namespace
- Non-hybrid Office 365 with separate namespaces
- On-premises Exchange with shared (single) namespace
- On-premises Exchange with separate namespaces

CMN's F/B Connector also supports several variations to the primary scenarios listed above. Accommodations for these variations are included in the configuration instructions in the *FBC Scenarios Guide*, and we summarize them briefly here:

- **Multi-Domain Support:** The Free/Busy Connector can facilitate the exchange of F/B information among multiple subdomains supported by both the Exchange and Domino servers.
- **Multiple Domino Servers:** CMN supports sharing F/B information between multiple Domino servers and a single Exchange server.
- **Domino Clusters:** CMN supports a cluster of Domino servers (ClusterNode1 and ClusterNode2) that provide Lotus Notes mail service in an active/standby redundancy configuration. In this case, only a single CMN Web Server is required to support both Domino servers.

F/B Connector Performance Counters

Quest CMN generates sets of performance counters for its Free/Busy Connector that feed live data to Windows' System Monitor feature. If you are unfamiliar with Windows' System Monitor feature, or how to add Quest CMN

counters to the System Monitor view, see your Microsoft documentation and/or visit the System Monitor online Help for more information.

The Quest CMN Free/Busy Connector includes these performance counters:

- **Quest CMN To Exchange Free/Busy** [queries from Notes users for Exchange users' F/B data]:
 - Number of free/busy requests to Exchange during last minute.
 - Average free/busy to Exchange response times during last minute.
 - Maximum number of free/busy requests to Exchange for one minute.
 - Maximum average free/busy to Exchange response times for one minute.
- **Quest CMN To Domino Free/Busy** [queries from Exchange users for Notes users' F/B data]:
 - Number of free/busy requests to Notes during last minute.
 - Average free/busy to Notes response times during last minute.
 - Maximum number of free/busy requests to Notes for one minute.
 - Maximum average free/busy to Notes response times for one minute.

F/B Connector Management Console

The CMN Management Console contains four screens for configuring the Free/Busy Connector. The Management Console saves F/B Connector configuration data in several data files. The Free/Busy Connector configuration files, unlike the config files for the DC and Mail Connector, are fixed at their default filenames and locations, and should not be opened or edited except through CMN's Management Console.

The Free/Busy Connector actually consists of two separate processes: one for the query-reply path in each direction. The Management Console therefore groups the Free/Busy configuration screens into two subgroups:

- **Exchange Free Busy Connector** screens configure CMN components that facilitate Notes queries for Exchange F/B info.
- **Notes Free Busy Connector** screens configure CMN components that facilitate Exchange queries for Notes F/B info.

Chapter 1 of the *User Guide* explains the basic operating concepts for the CMN Management Console. The topics below provide field notes for the Management Console screens that pertain to the Free/Busy Connector.

Management Console screen: QCalCon Domino Server Task | Qcalcon Settings

The values on this screen provide information needed by the Qcalcon server task to communicate with the Quest Exchange Free/Busy Connector Service.

Gateway Mail File Name: Name of the gateway mailbox DB on the Domino server (e.g., *mail.box*). This should be the same as the Calendar system name.

CMN Exchange Free/Busy Connector Host Name: Name of the computer running the Exchange Free/Busy Connector Service.

CMN Exchange Free/Busy Connector Service Endpoint: This field is filled by CMN and cannot be edited. The value is derived from the **Host Name** value.

[Test] button: Click the **Test** button if you want to test the connection to the Endpoint entry. The Management Console will post a dialog box with the test results. Click **OK** to clear the dialog box.

Management Console screen: Notes F/B Connector | Domino Free/Busy Settings

Domino Server Name: Name of the Domino server, used to gather F/B information of Notes users. For example, *NotesHost/NotesDomain* or *NotesHost*

Domino User Fetch Interval In Minutes: Interval between requests for new users, a value from 15 to 1440 inclusive.

Domino User Smtip Domain: Name of the Domino domain. For example, *domino.sitraka.com*

SMTP Domain Mappings: Used when the domain specified in Notes for a Notes user's email address is different from the domain specified for the same Notes user on an Exchange system, and to enforce a match between the AD *targetaddress* values and users' actual Domino email addresses. For example, if the user's email address in Notes is *JohnSmith@notesdomain.com*, and his email address in Exchange is *JohnSmith@exchgdomain.com*, then an SMTP domain mapping would be created for *exchgdomain.com=notesdomain.com*. Then when Outlook does a F/B search for *JohnSmith@exchgdomain.com*, the CMN F/B Connector translates the Notes request to *JohnSmith@notesdomain.com*. **SMTP Domain Mappings** are used only for Exchange-to-Notes F/B queries. You can **Add**, **Edit** or **Remove** domain-mapped pairs in the table, as noted below.

- **[Add]** button: Permits the addition to the table of a new SMTP domain-mapped pair.
- **[Edit]** button: Select an existing domain-mapped pair in the table and click **[Edit]** to change either of the domain values.
- **[Remove]** button: Select an existing domain-mapped pair in the table and click **[Remove]** to delete it.

Domino Id File Path: Use the **Browse** feature ([...] button) to select the path and filename of the ID file that will be used to request F/B data from Domino, or just enter the path and filename into the text box.

Domino Password: Password associated with the **ID File** entered above.

Management Console screen: Notes F/B Connector | CMN Web Services

These values configure the CMN Web services.

Web Service Prefix: The first element of the name of the web service for the Domino Free/Busy Connector component. Typically this value is *autodiscover*, but this field permits an alternate web service prefix, to accommodate F/B coexistence with Exchange 2013 or Office 365 (Wave 14 or 15) where the prefix is configurable.

CMN Autodiscover Host Name: Host configured in DNS to run the CMN services and return Domino F/B information.

CMN Autodiscover URL: Pre-filled by CMN with the correct value derived from the **Host Name** entry above. This field cannot be edited.

[Test] button: Click **Test** if you want to test the connection to the URL in the adjacent field. The Management Console will post a dialog box with the test results. Click **OK** to clear the dialog box.

CMN EWS URL: The URL to the Quest Free/Busy Connector's EWS. For example:
https://<HostName>/EWS/Service.asmx

[Test] button: Click **Test** if you want to test the connection to the URL in the adjacent field. The Management Console will post a dialog box with the test results. Click **OK** to clear the dialog box.

EMS command: Pre-filled by CMN. This command must be run in the Exchange Management Shell to permit Free/Busy lookups to flow from Exchange to **CMN**.

CMN Domino Free/Busy Connector Host Name: Name of the computer where the Domino Free/Busy Connector is installed—typically this same computer (*localhost*).

Domino Free/Busy Service Endpoint: Pre-filled by CMN with the correct value derived from the Host Name entry above. This field cannot be edited.

[Test] button: Click **Test** if you want to test the connection to the **Endpoint** value in the adjacent field. The Console will post a dialog box with the test results. Click **OK** to clear the dialog box.

Management Console screen: Exchange F/B Connector | Exchange Free/Busy

Exchange Server Location: Select one of these three radio buttons to tell CMN's F/B Connector how to route free/busy queries to the coexisting Exchange environment—by **EWS Endpoint**, by **Autodiscover Endpoint**, or by **Autodiscover Only**.

Specify your choice by selecting one of these methods:

- **EWS Endpoint:** Select this option if you will coexist with an on-premises Exchange 2013 or 2010 environment with a single Exchange EWS whose location (URL) is fixed relative to CMN's Exchange FBC service. This approach typically yields the best performance of the three options, but is the least flexible since the connection will fail if the Exchange EWS is not at the specified URL. If you select this option, you must also specify:

- **Exchange EWS Host Name:** Name of the Exchange server where EWS requests should be sent.
- **EWS URL:** Location of Microsoft EWS web service on the Exchange server.



NOTE: All queries for Exchange users' F/B information must pass through an Exchange EWS, which facilitates communications between Exchange and the CMN Exchange FBC service.

In an Exchange environment with a single EWS at a known fixed location (URL), you can point the FBC service directly to the EWS by specifying the EWS URL and host name. If there is no single Exchange EWS with a known fixed location, the FBC service can query the Exchange Autodiscover service, which tracks and reports the current location of an available EWS.

If you will coexist with an Exchange environment where you don't know the location of either the EWS or the Autodiscover endpoint, the CMN FBC service will have to search the network for the connection.

- **Autodiscover Endpoint:** Select this option if you have an on-premises Exchange 2013 or 2010 environment with multiple Exchange EWS endpoints (for example, in a load-balanced environment) and you have an Exchange Autodiscover service that can determine which EWS endpoint to use. This can also be the best choice to coexist with Microsoft's hosted Office 365 (see the Office 365 notes below). Performance will be slower than if you direct the FBC service to a fixed-location EWS (above), but will still be faster than if neither the EWS nor the Autodiscover value is specified (below). If you select this option, you must also specify:

- **Exchange Autodiscover URL:** Location of Autodiscover service on the Exchange server (or, for Office 365, of the MS Autodiscover URL, as noted below).



NOTE: If coexisting with Microsoft's Office 365: Select the **Autodiscover Endpoint** option and set the **Exchange Autodiscover URL** to Microsoft's Autodiscover URL:

<https://autodiscover-s.outlook.com/autodiscover/autodiscover.svc>

Note, however, that *this is a Microsoft URL subject to change*, in which case this connection and the Free/Busy Connector would fail. Remember this if you set the Exchange Autodiscover URL to the Microsoft URL, and CMN's F/B Connector works fine for a time but then suddenly and consistently fails. The most likely cause is a change in Microsoft's Autodiscover URL. Contact Microsoft to get the new URL, or select **Autodiscover Only** (below) instead.

- **Autodiscover Only:** Select this option if you will coexist with an Exchange 2013 or 2010 environment where you don't know the location of either the EWS or Autodiscover, such as in Microsoft's Office 365. In this case, the FBC service will search the network for the connection it needs, so this is the most flexible option, but it is also somewhat slower than either alternative above.

Regardless of your selection for **Exchange Server Location**, all of the fields listed below appear on this screen.

Exchange Online: Mark this checkbox only if you are configuring coexistence with Microsoft's Office 365 hosted Exchange services. If you are configuring coexistence with a local, on-premises Exchange server, make sure this checkbox is *unmarked*.

Exchange Username: Admin account the F/B Connector should use to access data and features in a hosted Exchange environment. Leave this field empty unless you are connecting to a hosted Exchange, or to a local on-premises Exchange that isn't in the same domain as the CMN admin server. In those cases an entry here is mandatory.

Exchange Password: Password associated with the **Exchange Username** entered above—again, enter this value only if connecting to a hosted Exchange, or to a local on-premises Exchange that isn't in the same domain as the CMN admin server. In those cases an entry here is mandatory.

Show Tentative As Busy: Select **Yes** or **No** to indicate whether *Tentative* F/B status in Outlook should appear as *Busy* in Notes.

Azure Cloud Instance: Use the drop-down list to specify the Office 365 environment you want to use—again, select a value only if connecting to a hosted Exchange. The options are as follows:

- Office 365 Global
- Office 365 Germany
- Office 365 operated by 21Vianet

The Log Viewer

The Log Viewer utility simplifies the viewing and interpretation of program log files, which document alerts and warnings in Quest programs. The same Log Viewer is used for Quest Software Inc.'s CMN, CMG, MNE and MFG products.

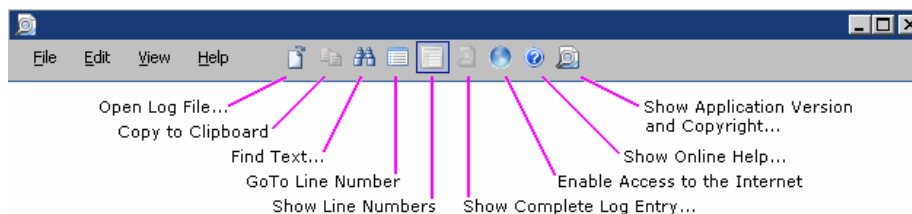
IMPORTANT: The full benefit of Quest's Log Viewer requires the application to transmit log event codes from the computer hosting the Log Viewer to a remote Quest database of *Solutions* (useful information about the events associated with the log codes). The Quest *Solutions* database then sends a corresponding *Solution* back to the Log Viewer for display to the user.

This feature is enabled by default, but can be disabled by deselecting the **Enable Internet Access** option on the **View** menu. For more information, see the **IMPORTANT** disclosures in the **View** menu topic below, in the field notes for the **Enable Internet Access** option.

These Log Viewer topics document [Log Viewer menus and toolbar](#) and [How to ...](#) (accomplish various tasks).

Log Viewer menus and toolbar

Most Log Viewer features are accessible by the program's menus and/or the program toolbar, which share a horizontal band across the top of the screen:



Several features are also available directly from the keyboard, and those keyboard shortcuts are displayed in the menus and noted here.

The Log Viewer menus are: [File menu](#) • [Edit menu](#) • [View menu](#) • [Help menu](#)

File menu

- **Open Log File...** (or Ctrl+O): Opens a standard Windows *Open* dialog box, from which you can specify the file you want to open into the Log Viewer. The Log Viewer can open and display *WLog* (optionally compressed) files, and plain text files.

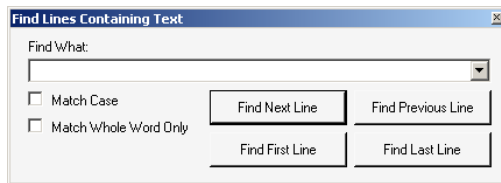
NOTE: Drag-and-Drop Option: You can also open a wlog file in the Log Viewer by dragging and dropping a filename from Windows Explorer into the Log Viewer window.

- **Save Copy Of Log File As...** (appears only when a file is open): Opens a standard Windows *Save As* dialog box, from which you can specify the filename and location where you want the open file to be saved. The Log Viewer lets you edit the contents of an open file, but will not replace the original on disk with the edited version (you cannot save it under the same name in the same location).
- **Recent Files:** Shows a list of recently opened files, from which you can select a file to re-open (to quickly re-open a file you have recently viewed and closed).

- **Exit:** Closes the Log Viewer window.

Edit menu

- **Copy** (or Ctrl+C): Copies the selected line to the Windows clipboard.
- **Find...** (or Ctrl+F): Opens a **Find** dialog box that lets you specify a text string to search for within the open file:



The dialog box lets you search for the next or preceding occurrence, or for the first or last occurrence in the file. The **Find** feature highlights the entire line that contains the target string.

- **Go To Line Number:** Open a dialog box that lets you jump to a particular line number of the file. (Enter the line number and click **OK**.)

View menu

- **Show Line Numbers** (or Ctrl+L): Toggles the display of line numbers (within the open file) on and off.
- **Show Complete Log Entry** (or F5): Opens a *Log Detail* window that shows the entire string for the selected item—useful when the item text overruns the Log Viewer's maximum line length (maximum 259 characters), or if the line extends beyond the right edge of the viewer window without wrapping.
- **Enable Internet Access:** Toggles the Internet connection on and off. Note these important disclosures:

IMPORTANT: The full benefit of Quest's Log Viewer requires the application to transmit log event codes from the computer hosting the Log Viewer to a remote Quest database of *Solutions* (useful information about the events associated with the log codes). The Quest *Solutions* database then sends a corresponding *Solution* back to the Log Viewer for display to the user.

This feature is enabled by default, but can be disabled by deselecting this **Enable Internet Access** option (on the **View** menu). Note:

- The Log Viewer sends event codes to Quest servers in the United States, as the codes appear in a log file that has been opened into the Log Viewer window.
- The Log Viewer sends only event codes and source IP addresses to Quest's server. No personally identifying information other than IP addresses is collected or sent.
- Quest's transmission of *Solutions* corresponding to received event codes is fully automated (no human intervention or observation). Quest tallies the frequencies of event codes received and *Solutions* sent in reply, but does not associate those tallies with IP addresses or any other personally identifying information, and no other information is logged.
- Quest servers treat each received event code as a query. Quest uses an event code only to determine which *Solution* to send back to the source of the query, and uses an IP address only to transmit the *Solution* to the source of the query. Quest servers log querying IP addresses as a matter of course, but Quest does not use them for any other purpose and does not disclose them to any other entity.
- You may opt out of this feature, to prevent the transmission of event codes and IP addresses to Quest, by unmarking the **Enable Internet Access** option on the **View** menu.

- **Goto Line Number:** Prompts for a line number in the file to display.

Help menu

- **Online Help...** (or F1): Opens Quest's online Help file for the Log Viewer, which documents its features.
- **About...:** Opens a window of information about the Log Viewer—identifying the current release, and asserting Quest's intellectual property rights to the software.

How to ...

To open a specific log:

- Drag and drop a wlog file name from Windows Explorer into the Log Viewer window.
— OR —

Click the **Open Log File** button (in the Toolbar) to view a list of log files that can be opened. In the *File* section of the screen, select a log file and click **OK** to open the log in the Quest Log File Viewer.

i | **NOTE:** The **Open Log File** button in the Management Console's *Health* screen is enabled only when the *UdpAppender* is defined in the *log42net.config* file of at least one module. During a new installation, the Log Viewer installer installs a file with the required *UdpAppender*. During an upgrade, however, the installer does not overwrite the *log42net.config* file, so the *UdpAppender* is not present, and this makes the **Open Log File** button invisible. To correct this, see *To Add the UdpAppender to an Existing Log File* at the end of the *Configuring CMN Logging* Appendix.

To find a particular text string within an open file:

- **Edit** menu | **Find...** (or Ctrl+F): Opens a **Find** dialog box that lets you specify a text string to search for within the open file. The **Find** feature highlights the entire line that contains the target string.

To re-open a recently viewed file:

- **File** menu | **Recent Files:** Shows a list of recently opened files, from which you can select a file to re-open (to quickly re-open a file you have recently viewed and closed).

To save a copy of a file:

- **File** menu | **Save Copy Of Log File As...** (appears only when a file is open): Opens a standard Windows *Save As* dialog box, from which you can specify the filename and location where you want the open file to be saved. (This feature does not permit any revisions to the open file. It simply lets you save the file *in its original form* to a new filename and/or a new location.)

To show or hide line numbers:

- **View** menu | **Show Line Numbers (or Ctrl+L):** Toggles the display of line numbers (within the open file) on and off.

To jump to a particular line number in the file:

- **Edit** menu | **Go To Line Number:** Opens a dialog box that lets you specify the destination line number. (Enter the number and click **OK**.)

To view an entire untruncated log entry:

- **View** menu | **Show Complete Log Entry (or F5):** Opens a Log Detail window that shows the entire string for the selected item—useful when the item text overruns the Log Viewer's maximum line length (maximum 259 characters), or if the line extends beyond the right edge of the viewer window without wrapping.

To turn internet access on or off:

- **View** menu | **Enable Internet Access:** Toggles the Internet connection on and off.

To copy a selected line to the clipboard:

- **Edit** menu | **Copy** (or Ctrl+C): Copies the selected line to the Windows clipboard.

To close the log viewer:

- **File** menu | **Exit:** Closes the Log Viewer window, or click the Log Viewer **Close** box (**[X]**) to dismiss the window and return to the previous display.

Appendix A: Known limitations

The known limitations of any coexistence method are usually due to feature inconsistencies between the two environments. That is, features that are available in one environment may not have an equivalent function in an alternate environment. Other limitations are due to feature incompatibilities, where similar features are available in both environments, but their implementations are so different that remediation is impractical.

- i** **NOTE:** Many of the Known Limitations documented here are due to known or suspected problems with the connected systems, rather than any inherent limitation of the coexistence process with CMN. We list them here as a courtesy, with known solutions (upgrades and hotfixes) where they exist.

Many of the known limitations listed here are inherent to the process and, as such, may not be resolved. Issues that we *do* expect to resolve in upcoming releases are itemized in the *CMN Release Notes*, under *Known Issues*.

Directory Connector issues

- The CMN Directory Connector cannot read a Notes Directory Catalog for a Notes-to-Exchange directory update.
- A Domino-to-Exchange Connector will not update Active Directory with a contact for a Domino group with no internet mail address. Domino may insert a mail attribute for a group when the internet address field is empty, in which case the group will be copied into Active Directory, although the internet address field will remain empty in Domino.
- When a CMN Exchange-to-Notes Connector updates Domino with a contact that contains no SN attribute in Active Directory, the object's CN attribute is copied into the SN attribute field in the Domino contact.
- The name of the source container for an Exchange-to-Notes connector cannot begin with the letters *CMN*. If the source container name begins with *CMN* the connector will generate an "Empty Recipient List" error.
- When provisioning or updating a user with no last name in the AD source, an E-to-N connector will sync the user to Domino with the first name in both the first name and last name fields.
- The **Add** and **Delete Verification** values in the *General* tab of *DC Advanced Settings* do not reset to zero if the corresponding checkboxes are unmarked.

Mail Connector issues

Meeting invitations sent from Notes to Exchange recipients

- When an Exchange invitee accepts a meeting invitation from a Notes organizer, the acceptance notification appears in some versions of Notes with an "i" icon. *This is a known consequence of the way some Notes versions process SMTP calendar messages*, and in any case is only a harmless cosmetic artifact.
- When an invitation originating in Notes is sent to an Exchange recipient, any inline image in the original invitation (including any DocLink icon) does not appear in Outlook. *This appears to be an Outlook issue rather than a CMN issue*.
- Multi-line subjects and locations in Notes 6.5.x meeting invitations appear in Outlook truncated at the end of the first line, *because Notes transmits only the first line*.
- If an invitation originating in Notes is sent to an Exchange recipient and requires that the recipient open an .ics file to accept the invitation, when the .ics file is opened and accepted by some other party with

delegated access (e.g., the recipient's secretary), the appointment is added to the other party's mailbox and not in the recipient's mailbox.

- When a Notes user organizes a meeting series, then reschedules a single instance of the series, and then invites an Exchange user to all instances, the Exchange invitee receives separate invitations for different portions of the recurring series. For example, if the Notes originator reschedules the time of a Wednesday instance (only) of an every-day recurring meeting, the Exchange invitee would receive one invitation for the Mon-Tues meetings, another invitation for the Wed meetings, and a third invitation for the Thurs-Fri meetings. The invitee can simply accept all of the invitations, but the tracking information associated with such acceptances may appear to the Notes originator as "no response" unless the *forcereplyremediation* config option is set.
- Notes does not recognize the delegation of an Exchange user's invitation by his/her forwarding the original invitation to another Exchange user. In this scenario, if the delegated user accepts the forwarded invitation, the Notes originator receives the acceptance, but the tracking shows "no response" from the original invitee, while the delegated user appears as an "unknown" user who accepted. Thereafter, any reschedule notice is sent to the original invitee (who delegated the invitation), but not to the "unknown" delegate invitee. *This is a known limitation of Notes that CMN cannot remediate.*
- When a Notes user with delegate access to another Notes user's calendar sends a recurring meeting invitation (on behalf of the other Notes user) to an Outlook user, then updates a single instance to change the date, and then adds another Outlook invitee:
 - The first Outlook invitee gets the date update but receives no indication of the new participant.
 - The new invitee is notified that he/she "may need to accept from calendar" (rather than accepting via the email invitation).
 - The delegate chair receives a message that "acceptances cannot be processed, error that they are not in mailfile."
- Meeting requests originating in Notes and sent to Exchange users may be off by one hour for meetings scheduled in the period between the second Sunday in March (when daylight savings time begins) and the first Sunday in April (when DST used to begin). *This is not a CMN defect, but rather an apparent issue in the way Windows processes time zone data.* Microsoft offers a free time-zone update utility (downloadable from <http://support.microsoft.com/kb/2443685>) that will likely correct this problem. Apply the update to the Windows OS on **both** the Domino server and the CMN admin server hosting the Mail Connector software.
- A meeting invitation from a Notes organizer to a Notes invitee, but then forwarded to an Exchange user, arrives in Outlook as an email, but not as a functional invitation that can be accepted/declined or added to the user's calendar. *This appears to be an issue with how Notes/Domino forwards an invitation rather than any limitation of CMN*, since the same behavior is observed when a Notes invitee forwards the invitation to another Notes user (where the invitation never passes through CMN).
- The original Comments entered with a Notes-sourced recurring online meeting request may be lost in an attendee's invitation and calendar if additional Comments are appended to the original Comments when rescheduling a single instance of the series. *This is a problem with some versions of Notes/Domino rather than with CMN.*

Custom meeting invitations

- The conversion of a custom-meeting invitation from Notes to Exchange introduces meeting date/time errors. The invitation in Outlook, if accepted, does not correctly add the meetings to the recipient's Calendar, and the **When** field contents are inaccurate. Therefore, CMN converts custom meetings to an appropriate series (with exceptions) for Exchange and attaches an .ics file that, when opened, will correctly add the series of recurring meetings to the recipient's Calendar. CMN also appends a notice in the message body, alerting the invitee and listing the true meeting dates and times.
- Exchange rooms and resources cannot properly process custom recurring meetings, regardless of the source. An Exchange room or resource does not respond to a request for a custom recurring meeting, with dates/times for multiple instances, and sends the request to its *Deleted Items* folder.
- An image in the message body of a custom meeting invitation originating in Notes, but received in Exchange, does not appear on the item in the Outlook Calendar after one of the .ics files is opened and accepted.

- Some custom meeting invitations (recurring events but irregularly scheduled) originating in some combinations of a Notes 6.5.5 client with a 6.5.3 Domino server are not transmitted out of the Notes/Domino environment. *This appears to be a Notes/Domino issue.*

Other meeting/appointment features

- Exchange cannot process the case of a Notes resource being available for only a part of a meeting series organized by an Outlook user. In this case, the resource account in Notes generates two accept/decline replies for the same meeting: one listing the date(s) for which it accepts, and the other listing the date(s) for which it declines. Exchange, however, does not support partial acceptance of a series, and cannot correlate these separate accept/decline notices to its original meeting record. The *Tracking* tab therefore incorrectly shows all instances as accepted, even though some were actually declined. CMN does explain this limitation to the Outlook organizer, and suggests: *Leave your calendar as it is, and simply note to yourself the date(s) that the resource has accepted and declined; or cancel the entire meeting series and create a new invitation rescheduled to accommodate the resource.*
- Notes does not correctly display (in the calendar) a meeting that spans two or more date boundaries—for example, a meeting that begins Monday and ends Wednesday. CMN detects such meetings and inserts a note explaining that the calendar may show only the first day, but the meeting can be opened to see the full duration.
- When an Exchange user reschedules an entire recurring meeting, the reschedule notification appears in Notes 6.5 as a cancellation, and the change is not processed by the Notes calendar. Therefore, CMN inserts a notice to the user explaining that he/she should "manually reschedule the meeting with the following dates...." This only occurs with Notes 6.5. In Notes 7.0.0 and higher, the reschedule notification appears in Notes in the form of an invitation to a new meeting, so CMN inserts the string "Rescheduled: " to prepend the invitation title (which matches the original invitation title), and the Notes calendar is correctly updated despite the possibly confusing message format.
- When a meeting with an online meeting place is rescheduled by a Notes user, the meeting URL does not appear in the *Location* field in the rescheduling notice in Outlook. Notes does not transmit the URL as it does when the meeting is originally scheduled, so CMN cannot insert the URL, and in Outlook the meeting appears to have a modified location and does not show the URL.
- A meeting time counterproposal from a Domino attendee to an Exchange meeting organizer often shows an incorrect "Current" meeting time in Outlook. The calendar processes the counterproposal correctly, and CMN inserts an explanatory note in the message, but incompatibilities between Notes and Exchange prevent CMN from determining the correct time for display in Outlook.
- Rescheduling a single instance of a recurring meeting to a date/time before the first instance of the series, or after the last instance, will create a duplicate instance if the rescheduled instance is not already the first or last of the series, respectively. The original, unchanged instance will remain in the calendar, as a part of the series, and the duplicate will appear at the rescheduled date/time but not as a part of the series. *This behavior occurs between Notes and Exchange, with or without Quest Coexistence Manager for Notes.*
- Rescheduling a single instance of a recurring series that has previously been rescheduled may, in certain specific circumstances, create a duplicate instance. The instance will remain in the calendar at its previously scheduled date/time, as a part of the series, and the duplicate will appear at the rescheduled date/time but not part of the series. *This behavior occurs between Notes and Exchange, with or without Quest Coexistence Manager for Notes.*
- When a single instance of a recurring series is rescheduled, and then an Exchange user changes the location of the entire series, the old and new locations both appear in Outlook, and CMN in turn passes this to any Notes invitee(s), where the same calendar error occurs. *This is a known Exchange limitation.*
- When a meeting request from an Exchange user (with Microsoft Rollup 5, 6 or 7 only) is accepted in Notes, the Notes user's response mistakenly appears in Outlook as "tentatively accepted."
- When an Exchange user declines a meeting invitation from a Notes 6.5 user, Notes reports a mail template error when attempting to remove the Exchange invitee. This is a limitation of Notes, and occurs only with Notes version 6.5.
- A Notes user who sends a meeting invitation to an Exchange user, and later removes the Exchange user, cannot then re-add the Exchange user. *This is a known limitation of Notes.*

- When an Outlook user invites a Notes user to a single-instance meeting, and the Notes user then delegates the invitation to the Exchange user, the notice back to the Outlook organizer does not identify the delegate and Outlook cannot automatically process the reply. Delegation to another Notes user does work, however.
- CMN is unable to completely reconcile an incompatibility between Notes and Exchange when a Notes user schedules a recurring meeting, and then reschedules a single instance, and then reschedules the entire series. For example:

- 1 Notes user schedules an every-day, Monday through Friday meeting recurring at 10am.
- 2 Notes user then changes the Wednesday instance (only) to 11am.
- 3 Notes user then changes the series as a whole to start at noon.

Notes processes the second change (in step 3) to preserve the one-hour difference on Wednesday, so that the Wednesday instance is rescheduled to 1pm. But Exchange cannot process this sequence. As a result, CMN sends a notification to any Exchange invitee, warning that only the first change has been processed, and listing the subsequent proposed changes to the other instances with a suggestion that the invitee make those calendar changes manually.

- The owner of a Domino resource is unable to approve a meeting request from an Exchange organizer when Owner Approval settings are in force for Domino resources. *This is a bug in the Notes client (not in CMN)*, and IBM may resolve the problem in a future Notes release.
- An Exchange user cannot schedule a recurring series of meetings with a Domino 6.5.x resource because Domino does not support this scenario over SMTP. (*This is a limitation of Domino, not of CMN.*) CMN will not relay any such attempt, and will send a brief explanatory notice back to the Outlook user.
- An Exchange user cannot reschedule an entire recurring meeting to which a Notes resource has been invited. CMN will not relay any such attempt, and will send a brief explanatory note back to the Outlook user.
- A Notes user who declines a meeting request from an Exchange user, and who unchecks the *Keep me informed of updates* checkbox in the Notes reply, still receives update notifications if the Exchange organizer reschedules the meeting.
- When an inline image occurs in a calendar message sent from an Exchange user to a Domino user, CMN converts the inline image to an attachment. *This is necessary to accommodate Notes' requirement for "content-disposition: attachment."*
- CMN does not support a scenario in which an Exchange user schedules a recurring meeting, invites a Notes resource, and then reschedules all instances of the recurring meeting. In that case, CMN prevents the delivery of the reschedule notice to Notes invitees, and sends a courtesy message to the Exchange originator explaining that he/she must delete the meeting series altogether and then recreate it at the new time.

Certain attributes, embedded elements and other features

- Exchange, and thus CMN, does not prevent delivery of a Notes-encrypted message to an Exchange recipient when TLS is disabled in Exchange and active mail processing is disabled in CMN. The message arrives in Outlook unencrypted. If active mail processing is enabled, however, the message remains encrypted in Outlook.
- An attachment to an encrypted Notes-to-Exchange message cannot be seen when opened from Outlook, if the source Domino Mail Router Server version is earlier than 8.5.3.
- An OLE object embedded as active content in a Notes message sent to another user—whether in Notes or in Exchange—arrives in the recipient's mailbox as a read-only document. *This is not a limitation of CMN, but appears to be the way Notes handles an OLE object within active content.* CMN simply relays the object in that state when it passes the message to Exchange. The recipient cannot alter the document and then return or forward it, as with other forms of active content.
- An NSF attachment may be un-openable by an Exchange recipient if the attachment name contains Japanese, Russian or Arabic characters. To prevent this issue, always use English-language attachment filenames.

- Relative font-size specifications in Notes' HTML message outputs (e.g., where sizes are specified as 1, 2, 3, etc.) can cause mismatched font sizes in Outlook. This appears to be caused by the two-step conversion process: First the point sizes of the Notes original are mapped to the 1-2-3 sizes in the HTML output, and then Outlook interprets the HTML to re-map the 1-2-3 sizes back to point sizes, but according to its own (apparently different) mapping methods.
- Read receipts and delivery receipts do not function between Notes and Exchange, in either direction. A Notes user requesting a delivery receipt from an Exchange recipient is notified that the server does not support delivery status notifications. An Exchange user requesting a delivery receipt from a Notes recipient is notified that the message was relayed, but that Notes sent no delivery notification. Senders requesting read receipts are not notified that the feature is not supported.
- A meeting invitation originating in Notes and sent to an Exchange user, and containing an embedded (pasted) picture, appears in Outlook with an empty rectangle in place of the picture.
- An email or calendar item designated by an Exchange originator as "low" importance, and sent to a Notes recipient, loses that designation in the Notes environment. A "high" importance designation, however, is retained in Notes.
- Notes priority designations (Low, Normal, High) assigned to calendar invitations are not retained for an Exchange recipient, although priority designations are preserved for non-calendar emails.
- An *Expires After* value in a message originating in Exchange is lost when the message is delivered to a Notes recipient. Both Notes and Exchange permit setting an expiration date for a message, after which it is safe to delete or archive the message. That value is preserved for messages originating in Notes and delivered to an Exchange recipient, but is lost in the other direction.
- The Outlook voting-buttons feature is not preserved in messages sent from Exchange to Notes.
- A moodstamp in a message originating in Notes is not preserved when sent to an Exchange recipient.
- An attendee added as optional in Notes appears as a required attendee in Exchange. *This is a Notes issue that CMN cannot detect and fix.*
- Calendar items sent as attachments to messages originating in Outlook do not open in Notes.
- As of October 31, 2018, Microsoft Office 365 will remove support for TLS 1.0 and 1.1. This means that all client-server and browser-server combinations must use TLS version 1.2 or later. In this scenario, a connection needs to be secured but fails when mail is sent from Office 365 to a Domino server that does not support TLS 1.2. (i.e., Domino version is lower than 9.0.1 FP3 IF2).

Notes DocLinks

- Notes DocLinks are sometimes lost in messages forwarded from Notes to Exchange recipients, because the Domino SMTP gateway occasionally fails to include the DocLinks in such messages. *This is a Notes limitation.*
- When a message containing a Notes DocLink is created in Notes by selecting **Copy into New Memo** after opening a message containing a DocLink, the DocLink is lost upon receipt of the message in Exchange.
- In some environments, when you choose to **Convert to NDL Attachment** (in the Mail Connector Management Console, *Notes Doc Links* screen), an Outlook recipient can successfully open an .ndl attachment only if the required Notes client on the user's workstation is not already running. If the Notes client is already running, the user sees an error message: *Invalid directory name or device not ready*. In that case, the attachment should open if the user dismisses the error message, exits from the Notes client, and re-clicks on the attachment.

Resources

- If you are using Quest's Migrator for Notes to Exchange (MNE) to migrate from Notes to Exchange: The current version of MNE cannot set visibility on resources. This can be done manually, or the resources could be removed/disabled after they are migrated.
- When a Notes user adds a room resource to a previously scheduled and accepted meeting, the added room appears in Exchange meeting forms as an attendee but not as the meeting Location.

- A contact object representing a room can be added to the Exchange 2010 Room Finder Distribution List only if it is an actual room with an associated mailbox—that is, only after the resource has been migrated and brought live in Exchange.
- A Notes user requesting a Notes resource no longer appears in the *From* field of the booking-request message to the resource owner after the owner has migrated to Exchange. The requestor's name does appear in the body of the message, but only in *addr-spec* format (the left-hand side of his/her email address). *This is a known Domino issue*; Domino does not send the name except within the message body.

Active mail

- Active Mail attachments cannot be opened from a Web Access connection to an Exchange Inbox. The Web Access Inbox shows that a message with an Active Mail attachment has been received, but the attachment cannot be opened without the Notes client installed on the local machine, and Web Access permits only a download of the attachment.

.ics files

- A table within an .ics file is rendered correctly within the body of a message, but loses its table formatting within the .ics file.

Free/Busy Connector issues

- Notes queries for free/busy information from meetings with any external users can take longer and in some cases fail to return data for internal users. *This is a known issue with Notes/Domino*, which places such requests in the *LWPSCHEDGATEWAY* queue instead of the configured queue preferred by CMN (in most cases called *MAIL.BOX* or *MAIL1.BOX*).
- The *Get-CmnExchangeWebServicesUrl* command does not work in a single-namespace environment.

Appendix B: Troubleshooting

This Appendix describes the most common problems encountered when installing and using Quest Coexistence Manager for Notes, and provides suggestions and procedures that are most likely to resolve them. Virtually all of these issues are unique to particular CMN components—the Directory Connector vs. Mail Connector vs. Free/Busy Connector. Such component-specific issues are listed and discussed separately, grouped by CMN component, following the more general introductory notes and comments below.

Many issues can be resolved quickly by reviewing this short list of preliminary checks before calling Quest Support:

- **Review the component log file(s).** You can find valuable information about component errors and warnings in the components' respective log files. If you call Quest Support and a support engineer can't immediately identify the problem, typically he/she will ask for copies of your log files.
- **Verify system requirements.** CMN problems are often traced back to inconsistencies between the product's system requirements and the host network's hardware or software specifications. You may therefore save yourself some time and trouble by simply comparing your local system to the CMN system requirements. System requirements are documented in the *RTM Release Notes*.
- **Always ask yourself:**
 - **Is this a known limitation or known issue?** Check [Appendix A: Known limitations](#) in this *User Guide*, and the *Known Issues* section of the current CMN *Release Notes*, to see whether the problem might simply be a known limitation of the process.
 - **What has changed since the last server restart?** Configuration values are normally updated only when a service is restarted. This can hide a pending problem for weeks or longer until an administrator restarts the services and the changes are applied.

Directory Connector

CMN Directory Connector service does not start

Verify that all system requirements have been met (see *System requirements* in the *RTM Release Notes*).

Verify that you have a valid Quest License Key installed. For more information, see [About Quest license keys](#) in User Guide chapter 1.

Connector Creation Wizard does not save connector definition

A Connector definition—the information that creates and characterizes a Connector—is part of the configuration.xml file that governs the operation of the overall Directory Connector component. The Directory Connector configuration file may contain one, two or more Connector definitions. The Connector Creation Wizard does **not** save Connector definitions to disk; it only adds or edits them in the open Directory Connector configuration file, *which then must be explicitly saved to disk in the CMN Management Console*. If you do not save the overall DC configuration file, any new Connector definitions or changes to existing Connector definitions will be lost when you exit the Management Console.

For more information see, in User Guide chapter 2: [Step 4: Run the DC Management Console and Connector Creation Wizard to create connector\(s\)](#).

Domino or Exchange server denies access to Directory Connector account

The account usernames required for access to the Domino Directory and Active Directory can take different forms in different environmental contexts (including where the Directory Connector's host computer resides within the network, relative to the server that a DC Connector is trying to reach. It is therefore possible (but uncommon) that access will fail even if you enter the correct credentials into the Connector Creation Wizard. In this case, you can usually resolve the problem by expressing the username in some other form, such as:

For Domino	For Exchange
NotesAdmin	Domain\Admin
NotesAdmin/domain	Admin@mydomain.com

Edit the **Username** field in either the *Source* or *Target Server Information* screen—whichever server is denying access—and then run the Connector again.

Connector Creation Wizard doesn't populate selection lists with existing target or source OUs

CMN's Connector Creation Wizard is designed to scan the source and target OUs to generate lists of valid options for the source and target OUs. Ordinarily, the Wizard requires source and target OUs be selected for a connector definition based on the results of these scans. However, in the rare event the Wizard encountered a corrupt OU structure, it may be impossible to select an OU and complete the Connector configuration.

A CMN configuration parameter provides an option to bypass these OU scans and disregard the OU verifications. With this feature configured to ignore the OU scans, the Wizard can advance to the next screen whether or not the OU selection can be confirmed—so you can continue the connector definition.

To enable this feature (to disable the verifications), set this boolean parameter setting in CMN's *Configuration.xml* file from false to true:

```
<IgnoreWizardOUCheck>true</IgnoreWizardOUCheck>
```



NOTE: CMN automatically adds this parameter to *Configuration.xml* when installing the Directory Connector. The parameter is set to *false* by default (which leaves the Wizard's verifications intact). To enable this feature, change the value to *true*, as shown above. Quest recommends maintaining the *false* setting for this feature unless the Wizard encounters a corrupt OU structure.

Then, use the *Custom Configurations* tab of the connector's *Advanced Settings* to configure the Directory Connector for the OU(s) you want to appear in CMN's selectable list. You must define separate lists of available OU(s) for the Notes environment as the source and as the target.

The table in the *Custom Configurations* tab shows parameter names (the **Key** column) and their corresponding **Values**, as they now occur in the connector's *config.txt* file. You can change the value of an existing parameter, or add a new one. Click **Add** to add a new parameter. A dialog box opens with two fields: **Key** and **Value**.

For Notes as the source, define this parameter and value:

- **Key:** sourcecontext
- **Value:** [the desired OU(s) – e.g., *ou=org1,o=contoso*]

For the source parameter (only), you can enter a **Value** with multiple containers by using vertical bars (|) to separate the containers.

Then define another parameter and its value for Notes as the target:

- **Key:** destsubtree
- **Value:** [the destination OU for synched data – e.g. *o=contoso*]

Exchange-to-Notes connector generates *Empty Recipient List* error

The name of the source container for an Exchange-to-Notes connector cannot begin with the letters *CMN*. If the source container name begins with *CMN* the connector will generate an *Empty Recipient List* error.

DC Connector does not find or copy Notes resources

If resources are not extracted from Notes during a connector's initial run, verify:

- Each resource in the Notes source must have a mail address: the *Mail=jon.doe@xyz.com* address as seen in LDAP, which is the Internet address of the resource.
- If any Notes resources are defined but not associated with an Organization, then the DC's search for resources must begin at the ROOT container, not *O=NotesDomain*, unless your intent is to specifically limit the scope by Organization. For example, "Room A" with no associated organization would be found in the ROOT, and "Room A/Domain" would be found in *O=Domain*. For this case the DC Connector could be configured for a Source OU of *O=Domain*.

Connector errors due to duplicate objects

CMN's Directory Connector may produce a duplicate object record (sharing the same SMTP address) in Active Directory if an existing AD object had previously been added to the Domino Directory—either manually, or by some other directory tool such as Microsoft's Transporter. In this case, the first run of a Notes-to-Exchange Connector will copy the Domino object back to Active Directory as a contact, where it may generate a duplicate record. And then the first run of an Exchange-to-Notes Connector will copy it back to Domino.

To resolve this issue, check the Domino Directory for such objects before the first CMN Directory Connector run, and:

- Manually remove them from Domino, since they will then be restored (as they should be) by the first run of an Exchange-to-Notes Connector.
— OR —
- Keep the objects, by moving them to a Domino container outside the scope of the container from which CMN's Directory Connector will copy object data.
— OR —
- Hide them with Notes' visibility feature—although a Notes-to-Exchange Connector may still find some and produce duplicates in AD.

"Object class violation" error when trying to sync from Exchange to Notes

The most likely solution is to turn off the LDAP document schema enforcement. In Domino, set *Enforce schema* to **No** for the LDAP document.

Other Directory Connector Issues

Look through your CMN Directory Connector log files for clues to help diagnose and resolve the problem.

Mail Connector

CMN Mail Connector does not start

Verify that all system requirements have been met (see *System requirements* in the *RTM Release Notes*).

Verify that you have a valid Quest License Key installed. For more information, see [About Quest license keys](#) in chapter 1.

Server disallows message

CMN processing may marginally increase or decrease the size of a message, which may rarely push a message over a receiving server's size limit even though the original message was smaller than the server's configured limit.

External mail recipients' message replies are bouncing (with subdomain mail routing)

A subdomain routing method may introduce a risk that the assigned subdomain names will escape your organization's internal communications, which in turn can cause bounce-backs on replies to those addresses. To prevent this problem, set the Notes *forwarding address* attribute to *user@subdomain@notesdomain*, which causes Domino to set the reply address for external email to the user's primary SMTP address (internet address field value).

Notes-to-Exchange email delivery slowed by long delays with Exchange 2010 SP1 RU4

This may be caused by a *shadow redundancy* feature built into Exchange 2010 SP1 RU4. Shadow redundancy keeps a copy of a message on the previous hop until the server verifies that it has successfully delivered it to all the next hops—which isn't possible when receiving a message from a mail server (like CMN) that doesn't support shadow redundancy. In that case, Exchange delays its acknowledgement to the sending server until it verifies that the message has been successfully delivered, or until a specified timeout interval expires (without verification), whichever comes first. The timeout interval is specified by the *MaxAcknowledgementDelay* attribute of each Receive connector. The default value is 30 seconds.

If this seems likely to be the cause of the problem, try disabling the *MaxAcknowledgementDelay* feature.

Notes recipient calendar does not correctly process invitations or meeting changes originating in Outlook

The Domino server is likely misconfigured (in the **Outbound** servers screen of CMN's Management Console) for the wrong version.

Notes implements some features differently in different client versions, and CMN can process messages differently to accommodate those differences. Each Domino server is designated (in the Management Console) to a particular version, so CMN will know how to process messages bound for that server.

Outlook recipient cannot open Notes active mail attachment

The .nsf attachment file is designed to open into a Lotus Notes client, so a Notes client must be installed on the Outlook recipient's computer, and must be connected to a Domino server. If the recipient has no Notes client installed, the attachment will not open.

Assuming a Notes client is installed on the Outlook recipient's computer, the NSF file type must be associated (in Windows) with the Notes client application. If the Outlook user has not defined that association, Windows will prompt the user to designate an application to use to open the file.

Notes recipient cannot open active mail attachment forwarded from Outlook

When a Notes user sends a message with Active Mail content to an Outlook user, who then forwards the message back to a Notes user, the Notes recipient is unable to open the .nsf attachment, and an error message reports that the database cannot be found. If the Notes recipient can save the attachment locally first, however, the attachment should open normally.

Active mail appears in Outlook as database with missing parts

Active Mail content that references shared resources not included in the CMN.ntf file will appear to an Outlook recipient as a database with empty cells or other missing parts. To correct this, verify any shared resources that will be referenced by Active Mail content are included in the CMN.ntf template file.

Notes user cannot send message to synced Exchange distribution group

This is an issue only in some environments, and the most likely solution is to change the message delivery restriction settings. Note that an Exchange group must be of the *universal distribution* type to be mail-enabled. For an admin to change the settings, beginning in the Exchange Management Console:

- 1 Select the group under **Recipient Configuration | Distribution Group**, then double-click the group you want to edit.
- 2 Click the *Mail Flow Settings* tab, and highlight **Message Delivery Restrictions**, then click **Properties** above.
- 3 De-select (unmark) the check box for **Require that all senders are authenticated**.
- 4 **Save**, and then restart the MS Exchange transport service.

Notes-to-Exchange meeting invitation time is off by one hour

Meeting requests originating in Notes and sent to Exchange users may be off by one hour for meetings scheduled in the period between the second Sunday in March (when daylight savings time begins) and the first Sunday in April (when DST used to begin). *This is not a CMN defect, but rather an apparent issue in the way Windows processes time zone data.*

Microsoft offers a free time-zone update utility (downloadable from <http://support.microsoft.com/kb/2443685>) that will likely correct this problem. Apply the update to the Windows OS on **both** the Domino server and the CMN admin server hosting the Mail Connector software.

“PermanentFailure” in CMN logs; EHLO command rejected or returned as unrecognized

A *PermanentFailure* appears in the CMN logs, and the SMTP logs show that the EHLO command was being rejected or returned as unrecognized:

```
Failed to send resource reservation request to resource: 'testroommigration@sitraka.ae':  
System.Exception: Failure response received: PermanentFailure
```

And about the same time:

```
Received response: 500 Syntax error, command "XXXX hostname" unrecognized
```

You may have a firewall that is inspecting message traffic and making changes, causing CMN to fail to send a message. Investigate the environment to make sure there is no firewall manipulating traffic. “XXXX *hostname unrecognized*” is the target server explaining why it rejected the message and why CMN failed to send it: it received “XXXX” when it was expecting “EHLO.”

Other Mail Connector issues

Look through your CMN Mail Connector log files for clues to help diagnose and resolve the problem. If necessary, see [Appendix C: CMN Logs](#) for instructions to configure the feature to suit your needs.

Free/Busy Connector

Troubleshooting tips for the F/B Connector are documented in an Appendix of the *FBC Scenarios Guide*.

Appendix C: CMN Logs

- [Log files for the Directory Connector](#)
- [Log files for the Mail Connector](#)
- [Log files for the Free/Busy Connector](#)
- [Configuring CMN logging](#)

By default, CMN is installed with the log4net utility to generate log files of CMN components' system activity. This information is critical to diagnosing any problems that may arise. CMN log entries look like this:

2011-02-18 16:20:43,851 INFO CMN.logging - Connection from 127.0.0.1:20045

2011-02-18 16:20:43,866 INFO CMN.logging - [1] Established channel from Notes(127.0.0.1:20045) to Exchange(10.4.160.17:25). Total Channels: 2

2011-02-18 16:20:48,804 INFO CMN.logging - [1] Message Sent From: , To: , Message Number: (1) Message ID: () Size: (5) Proc Time: (188)msec Routed From Notes(127.0.0.1:20045) to Exchange(10.4.160.17:25)

2011-02-18 16:20:49,788 INFO CMN.logging - [1] Router closed. Open Sockets: 0

2011-02-18 16:24:54,446 ERROR CMN.logging - [2] Message Failed 552 CMN was unable to process the message. ICal Error: The recurring series spans over 1000 days, and Exchange can not display it. From: somewhere@place.com, To: here@somewhereelse.com, Message Number: (2) Message ID: () Size: (244159) Proc Time: (2828)msec Routed From Notes(127.0.0.1:20056) to Exchange(10.4.160.17:25)

CMN logs are configured and saved separately, by component, in files that reside in or under each component's subtree root folder. CMN logging is enabled by default, for all CMN components, and the default configurations will be suitable for almost all organizations and circumstances. The parameters that are most often edited are listed in the procedure notes below.

CMN actually generates multiple log files for each component, so you can track different types and levels of program activity. All CMN logging-configuration files are xml-format files, which you can edit with any XML editor.



NOTE: The **Open Log File** button in the Management Console's *Health* screen is enabled only when the *UdpAppender* is defined in the *log42net.config* file of at least one module. During a new installation, the Log Viewer installer installs a file with the required *UdpAppender*. During an upgrade, however, the installer does not overwrite the *log42net.config* file, so the *UdpAppender* is not present, and this makes the **Open Log File** button invisible. To correct this, see [Adding the UdpAppender to an existing log file](#) at the end of this Appendix.

Log files for the Directory Connector

Logs are stored in the Logs subdirectory under the Directory Connector folder.

The Directory Connector log files *CMN.log* and *CMN_ERROR.log* are configured in the file *C:\Program Files (x86)\Quest\Coexistence Manager for Notes\Directory Connector\log42net.config*

The Directory Connector log files *Sync.log* and *Sync_ERROR.log* are configured in the file *C:\Program Files (x86)\Quest\Coexistence Manager for Notes\Directory Connector\tools\log42net.config*

NOTE: The Sync log contains all the sync information for the connector that was run.
The CMN log contains only the start and stop information for the connector. I

The configuration section for each log file is listed below.

DC Log Filename	Configured in:
CMN.log	section <appender name="LogFileAppender" ...>
CMN_ERROR.log	section <appender name="ErrorLogFileAppender" ...>
Sync.log	section <appender name="LogFileAppender" ...>
Sync_ERROR	section <appender name="ErrorLogFileAppender" ...>

Log files for the Mail Connector

Logs are stored in the Logs subdirectory under the Mail Connector folder.

Mail Connector log files are configured in the file

C:\Program Files (x86)\Quest\Coexistence Manager for Notes\Mail
Connector\log42net.config

The configuration section for each log file is listed below.

MC Log Filename	Configured in:
CMN.log	section <appender name="LogFileAppender" ...>
CMN_ERROR.log	section <appender name="ErrorLogFileAppende
SMTP.log	section <logger name="SmtpFileAppender" ...>

Log files for the Free/Busy Connector

Logs are stored in the Logs subdirectory under the Free Busy Connector folder.

Free/Busy Connector logs are configured in the log42net.config file for each log listed below. The complete file path is

C:\Program Files (x86)\Quest\Coexistence Manager for Notes\Free Busy Connector\...

FBC Log Filename	Configured in:
EWS.log	...\Free Busy Connector\EWS\bin\log42net.config
Autodiscover.log	...\Free Busy Connector\Autodiscover\bin\log42net.config
DominoFreeBusyService.exe.log	...\Free Busy Connector\DominoFreeBusyService\log42net.config
ExchangeFreeBusyService.exe.log	...\Free Busy Connector\ExchangeFreeBusyService\log42net.config

Configuring CMN logging

A CMN configuration file will roll over to a new file (close the existing log file and create a new one) when its contents reach a particular size, or a particular time of day (e.g., midnight). Also, the log4net utility will create up to a certain number of sequential files before deleting the oldest to preserve disk space. By default the rollover method is size (default 10MB), to a default maximum of 25 sequential files, but these are configurable values, as noted in the procedure notes below.

Editing configuration settings in a CMN configuration file

To edit any of the configuration settings in a CMN configuration file:

- 1 Use an XML editor to open the configuration file (filenames in the right-hand column in the charts above).
- 2 *For the Mail Connector's SMTP.log file (only):* If you want to enable or disable SMTP logging altogether, find the section `<logger name="CMN. SmtplibProtocol.logging" ...>`, and then:
 - To enable SMTP logging:
 - Set the `<level value="INFO" />` parameter value to INFO.
 - Uncomment the line:
`<!-- <appender-ref ref="SmtplibFileAppender" /> -->`
 - To disable SMTP logging:
 - Set the `<level value="OFF" />` parameter value to OFF.
 - Restore the comment enclosures to the line:
`<appender-ref ref="SmtplibFileAppender" />`
- 3 *For a Directory Connector or Mail Connector log (only):* Find the corresponding section in the open file (section name also appears in the right-hand column above).
- 4 *For any/all component log files:* Make any desired changes. Values must be enclosed in double quotation marks and followed by a trailing space and slash character as shown in the field notes below.

The most commonly edited values in CMN configuration files are:

- **`<file value="[PathAndFilename]" />`:** Location and name of the log file that log4net will generate. The path specification can be absolute (e.g., `"C:\log4net\CMN.log"`) or relative to the installation directory (e.g., `".\log4net\CMN.log"`).
- **`<threshold value="INFO" />`:** Scope and level of detail to appear in the logs. A valid value is any of these single words: OFF FATAL ERROR WARN INFO DEBUG ALL

The values as listed here are in ascending order of detail, left to right, and the log will contain items at and above (to the left of) the specified value. For example, `<threshold value="WARN" />` tells log4net to include WARN, ERROR and FATAL events in the log file. The level is set to INFO by default.
- **`<rollingStyle value="Size" />`:** Determines what will trigger log4net's closing of a current log file and opening of a new one: either a change in calendar date, or a log file reaching a particular size. Parameter value is set to "Size" by default, or change to "Date" for the alternative.
- **`<maximumFileSize value="10MB" />`:** Maximum log file size—the size at which log4net will close the current log file and open a new one (applies only if `<rollingStyle value="Size" />`).
- **`<maxSizeRollBackups value="25" />`:** Maximum number of log files to keep—after which log4net deletes the oldest log file to create a new one.

(Not all of these parameters apply to all CMN components.)

- 5 **Close** and **Save** the configuration file under the same filename.

i **NOTE:** Any changes to the `log4net.config` file are immediately applied by the CMN service when the configuration file is saved.

For more detailed information about the log4net utility and how its log files can be configured, see the [log4net Config Examples](#) at the Apache.org web site.

Enable DEBUG logging for the CMN Directory Sync service

- 1 Stop the Coexistence Manager for Notes Directory Sync service.
- 2 Navigate to the log configuration file at
C:\Program Files (x86)\Quest\Coexistence Manager for Notes\Directory Connector\tools\log42net.config.
- 3 Open the file for editing.
i | NOTE: If desired, you can make a backup copy of the file prior to editing.
- 4 There are two entries for `<threshold value="INFO" />`.
One under `<root>` and a second under `<!-- Main log appender. -->`.
Change both entries to `<threshold value="DEBUG" />`
See the example below.
- 5 Save and close the file.
- 6 Delete, rename, or move the current log file at
C:\Program Files (x86)\Quest\Coexistence Manager for Notes\Directory Connector\Logs\Sync.log.
- 7 Start the Coexistence Manager for Notes Directory Sync service.
- 8 Once the troubleshooting is completed, change DEBUG back to INFO.

Example

```
<log42net>
  <root>
    <!-- Only log the INFO messages, change to DEBUG if you want more
         details in the ERROR log. This will have a substantial impact on
         the performance of CMN. -->
    <level value="DEBUG" />
    <!-- The main log. -->
    <appender-ref ref="LogFileAppender" />
    <!-- Broadcast via UDP. -->
    <appender-ref ref="UdpAppender" />
    <!-- Errors only log. -->
    <appender-ref ref="ErrorLogFileAppender" />
    <!-- Write to CONSOLE when running console application. -->
    <appender-ref ref="ColorConsoleAppender" />
  </root>

  <!-- Main log appender. -->
  <appender name="LogFileAppender" type="log42net.Appender.RollingFileAppender" >
    <file value="..\Logs\Sync.wlog" displayName="Directory Sync Service Main Log"
  />
    <!-- Change this to include more or less information in main log. -->
    <threshold value="DEBUG" />
    <appendToFile value="true" />
    <datePattern value="yyyyMMdd".wlog"" />
    <rollingStyle value="Size" />
    <!-- Change this setting to change the max log size. -->
    <maximumFileSize value="10MB" />
    <!-- Change this setting to change the max number of logs. -->
    <maxSizeRollBackups value="25" />
    <!-- Newest files have smaller numbers. -->
    <layout type="log42net.Layout.PatternLayout">
      <conversionPattern value="%date %-5level %logger [%t] - %message%newline"
    />
    </layout>
    <encoding value="utf-8" />
  </appender>
```

Adding the UdpAppender to an existing log file

The **Open Log File** button in the Management Console's *Health* screen is enabled only when at least one module has the *UdpAppender* defined in its *log42net.config* file. During a new installation, the Log Viewer installer installs a file with the required *UdpAppender*. During an upgrade, however, the installer does not overwrite the *log42net.config* file, so the *UdpAppender* is not present, and this makes the **Open Log File** button invisible.

For upgrades or installations prior to the current release, the *log42net.config* file must be modified in each module to enable live log viewing. In the `<log4net>` root in each module directory, add the following lines:

```
<root>
  <!-- Broadcast via UDP. -->
  <appender-ref ref="UdpAppender" />
</root>

<!-- UDP appender. -->
  <appender name="UdpAppender" type="log4net.Appender.UdpAppender">
    <threshold value="DEBUG" />
    <remoteAddress value="127.0.0.1" />
    <remotePort value="2500" />
    <layout type="log4net.Layout.PatternLayout">
      <conversionPattern value="%date{HH:mm:ss.fff}[%level]MC[%message]" />
    </layout>
  </appender>
```

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- View Knowledge Base articles.
- Sign up for product notifications.
- Download software and technical documentation.
- View how-to-videos.
- Engage in community discussions.
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