(x) matters®

The relevance engine company.

xMatters **(IT)** engine for IBM
Tivoli Netcool/OMNIbus

This manual provides information about xMatters. Every effort has been made to make it as complete and accurate as possible; however, the information it contains is subject to change without notice and does not represent a commitment on the part of xMatters No part of this document may be reproduced by any means without the prior written consent of xMatters

AlarmPoint Systems, Inc. is now xMatters, inc. This change extends to how we name our products: the AlarmPoint Integration Agent is now the xMatters integration agent; AlarmPoint Enterprise is now xMatters enterprise; and so on. You can learn more about why we changed our name at www.xmatters.com. During the ongoing transition to the new naming conventions, legacy corporate and product names will still appear in some parts of our products, such as directory paths, logs, and messages. This document reflects the new names whenever possible, while respecting the need for clarity when referring to older products, legacy issues, existing knowledge base articles, etc.

Thursday, March 22, 2012

Contacting xMatters

You can visit the xMatters Web site at: http:///www.xmatters.com

From this site, you can obtain information about the company, products, support, and other helpful tips. You can also visit the Customer Support Site from the main web page. In this protected area, you will find current product releases, patches, release notes, a product knowledge base, trouble ticket submission areas and other tools provided by xMatters, inc.

xMatters, inc.
Corporate Headquarters
12647 Alcosta Blvd., #425
San Ramon, CA 94583

Sales and Technical Support:

Telephone: 925-226-0300
Facsimile: 925-226-0310

support@xmatters.com
sales@xmatters.com
Customer Support Site: http://connect.xMatters.com

This integration was designed and tested on an unmodified version of IBM Tivoli Netcool/OMNIbus, and this document describes how to configure xMatters to integrate with the default installation. If you have customized or altered your instance of Netcool/OMNIbus, this integration may need to be modified for your deployment. Please note that these integration changes are not part of the services offered by xMatters Technical Support, but can be performed through the xMatters Professional Services department. For more information, contact your xMatters Sales representative.

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Chapter 1: Introduction

Welcome to xMatters (IT) engine for IBM Tivoli Netcool/OMNIbus. This document describes how to install and configure the xMatters (IT) engine for IBM Tivoli Netcool/OMNIbus software integration. The intended audience for this document is experienced consultants, system administrators and other technical readers.

1.1 Summary

xMatters is an interactive alerting application, designed to capture and enrich important events, to route those events to the right person on any communication device, and to give that person the ability to solve, escalate, or enlist others to resolve the events remotely.

xMatters allows you to take critical business information and contact the right people via voice phone, SMS, two-way pagers, instant message, and email.

Through relevance engines, xMatters can become the voice and interface of an automation engine or intelligent application (the Management System, such as Netcool/OMNIbus). When Netcool/OMNIbus detects something that requires attention, xMatters places phone calls, sends pages, messages, or emails to the appropriate personnel, vendors or customers.

xMatters is also persistent, escalating through multiple devices and personnel until someone accepts responsibility or resolves the problem. Once contacted, xMatters gives the notified person instant two-way communication with Netcool/OMNIbus. Responses are executed immediately on Netcool/OMNIbus, enabling remote resolution of the event.

This integration supports alert notifications (from Netcool/OMNIbus to xMatters). It also supports inbound actions (from xMatters to Netcool/OMNIbus).

Note that you may need to modify this configuration to suit your particular business requirements and adjust it to suit your expected loads. For example, the default integration features automatic status annotations to the original alert that indicate each stage of delivery. In a high-volume production system, this constant stream of communications from xMatters to Netcool/OMNIbus may result in a significant amount of network traffic that can affect overall system performance. Consider your expected volume of injected events and your server capacity when designing your own integration with xMatters..

1.1.1 Benefits

With the xMatters integration, the appropriate technician can be notified directly via voice, email, pager, BlackBerry, or other device. Information about the failure will be presented to the event resolver and decisions can be made in real-time.

Once a response is selected on the recipient's remote device, xMatters will update the alert in Netcool/OMNIbus in real-time. The benefit is that this process is immediate – significantly faster than the time required for staff to notice the failures or malfunctions, determine who is on call, and manually notify the right person. In addition, the ability to take simple actions on the alert from any device gives the event resolver a quick way to deal with many issues and communicate to other team members the current state of the alert.

During the process, every notification, response, and action is logged in xMatters. In addition, xMatters automatically annotates the original alert in Netcool/OMNIbus with status information.

The xMatters product features a self-service web user interface to allow accurate assignment of responsible personnel for each job. xMatters also includes a Subscription panel that allows both managed and self-subscription to Netcool/OMNIbus events.

1.1.2 Information Workflow

The following diagram illustrates a standard incident workflow in a network monitoring system, and how information from the management system is passed into the xMatters relevance engine:
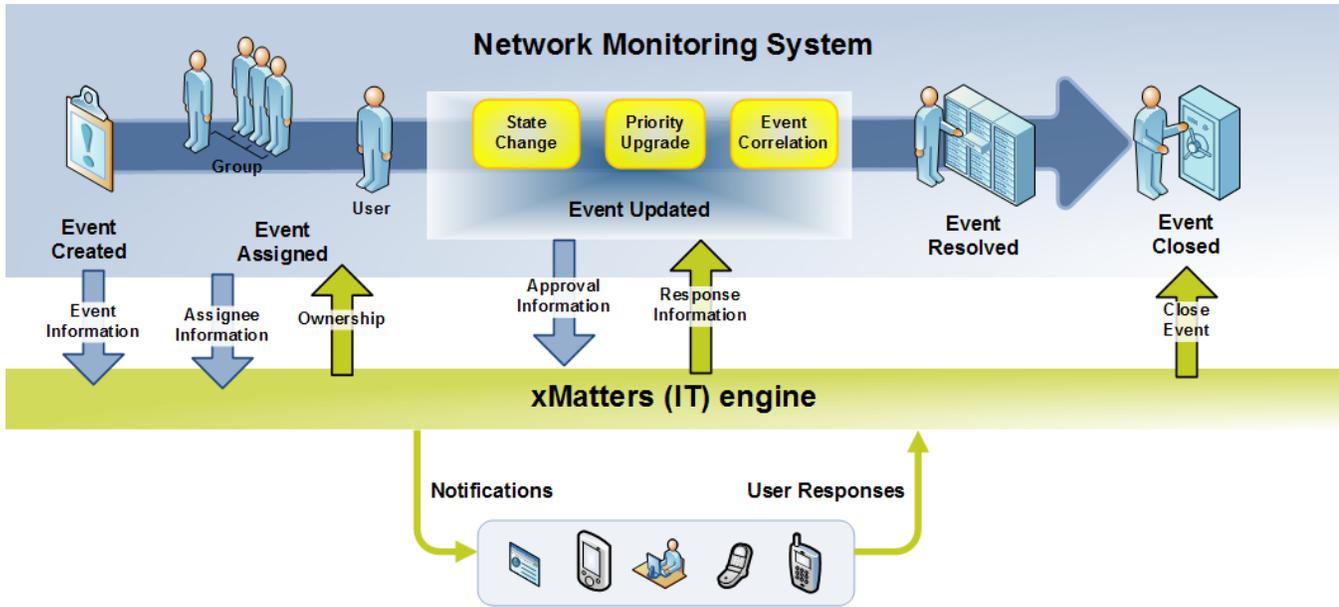
1.2 Integration architecture

The software components in this integration include:

- xMatters relevance engine
- IBM Tivoli Netcool/OMNIbus
- xMatters integration agent

Overview
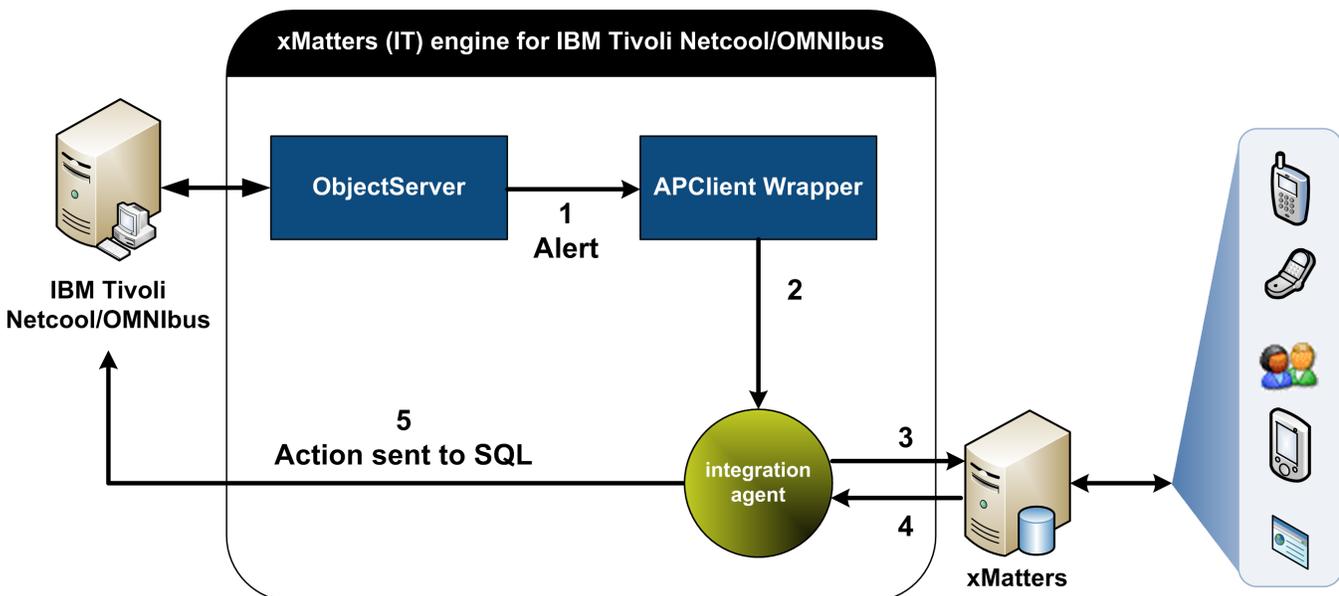
The following occurs for each alert within Netcool/OMNIbus that requires notification; the steps correspond to the numbers in the diagram above:

1. Netcool/OMNIbus calls the xMatters Netcool-APClient.bat with the alert details.
2. The request is forwarded to the integration agent.
3. The integration agent sends an enriched message to xMatters, which notifies the appropriate recipients.
4. The response returns to the integration agent.
5. The integration agentupdates the alert in Netcool/OMNIbus via JDBC to the Netcool/OMNIbus Sybase database.

1.2.1 Event workflow

The following describes the interaction between Netcool/OMNIbus and xMatters during the course of a typical alert.

Alert injection

Alerts may be injected from Netcool/OMNIbus in one of two ways:

- While using the included Event Viewer (`xmatters.elc`), a user can right-click an event, and then select **Tools > Dispatch to xMatters**. This updates the XMTarget field to the specified user, and changes the XMState to Marked for Dispatch.
- Automated injection (new to this version of the integration) is based on a trigger included with the integration, xMatters_auto_dispatch_trigger. This is configured to process any alert with a Severity equal to or greater than 4 (Major or Critical), that is not Acknowledged, and has an XMState of "0" (or New). The trigger updates the alert to change the XMState to Marked for Dispatch, and changes the XMTarget field to xMattersUsers.

Once the alert is marked for dispatch, the xMattersEvent trigger reacts to the changed state and sends the details to the xMattersEvent procedure. The alert details are then sent to Netcool-APClient.bat, which forwards the request to the integration agent.

Note that the above description identifies the behavior of the default installation configuration. The integration is highly customizable, and can be configured to suit your specific deployment requirements.

It is recommended that you review the included XMTarget configuration and update it if you want to choose a different xMatters recipient. Note that Subscriptions will still be created and sent regardless of the XMTarget.

1.3 System Requirements

The following products must be installed and operating correctly prior to integration.

xMatters:

- xMatters relevance engine 4.1 (patch 011 or later) or 5.x
- xMatters integration agent 4.1 (patch 005 or later) or 5.x
- xMatters Developer IDE

Note that the version number of the xMatters integration agent and xMatters relevance engine must be the same. For example, if you are using the 4.1 version of the integration agent, then you must also use the 4.1 version of the xMatters relevance engine.

Netcool/OMNIbus:

- IBM Tivoli Netcool/OMNIbus 7.3.1

Note that the base installation folder for Netcool/OMNIbus is referred to throughout this document as `%OMNIHOME%`.

1.3.1 Operating Systems

The following component versions, operating systems and databases are supported by this integration.

Integration Component	Version	Operating System	Database
xMatters relevance engine	4.1 patch 011	Microsoft Windows 2003 and 2008 (validated)	Oracle 11g
			Microsoft SQL Server 2008
	5.0	Linux CentOS 5.3 (validated)	Oracle 11g (validated)
xMatters integration agent	4.1 (patch 005 or later) or 5.x	Microsoft Windows 2008 (validated)	
		Linux CentOS 5.3	
IBM Tivoli Netcool/OMNIbus	7.3.1	Microsoft Windows 2008	Sybase Database
		All operating systems supported by the xMatters integration agent	

Note: *xMatters version 5.0 is currently available only for Linux/Oracle deployments. The integration agent is supported on multiple platforms.*

For more information about the supported operating systems for xMatters, refer to the *xMatters installation and administration guide* and *xMatters integration agent guide*.

1.4 Conventions and Terminology

This section describes how styles are used in the document, and provides a list of definitions.

1.4.1 Conventions

Some instructions appear in the following format: **MENU > OPTION**; for example, **File > Open** means click the **File** menu, and then click the **Open** menu option.

Words in **bold** typically reference text that appears on the screen. Words in `monospace` font represent the following:

- text that must be typed into the computer
- directory and file names
- code samples

Directory paths

Except where explicitly stated, the directory paths in this document are listed in Windows format. Unix users must substitute the given paths with the Unix equivalents.

The xMatters installation folder is referred to throughout the documentation as <xMHOME>.

- On Windows systems, the default location for the 4.1 version of xMatters is `C:\Program Files\AlarmPointSystems\AlarmPoint`
- On Unix systems, the default location for the 4.1 version of xMatters is `/opt/alarmpointsystems/alarmpoint`; for the 5.0 version, the default location is `/opt/xmatters/5`

Note: *xMatters version 5.0 is currently available only for Linux/Oracle deployments. The integration agent is supported on multiple platforms.*

The xMatters integration agent installation folder is referred to throughout the documentation as <IAHOME>.

- On Windows systems, the default is `C:\Program Files\AlarmPointSystems\IntegrationAgent` for the 4.1 version, and `C:\Program Files\xmatters\integrationagent` for the 5.0 version.
- On Unix systems, the default is `/opt/alarmpointsystems/integrationagent` for the 4.1 version, and `/opt/xmatters/integrationagent` for the 5.0 version.

1.4.2 Terminology

The following terms are used through the xMatters documentation.

Documentation terminology

Term	Meaning
Event	An *event* refers to any situation or item of interest detected by the management system, and which requires attention. Event is also used to refer to the incident or situation as it progresses through the xMatters system, from injection to notification to resolution. Each event must generate at least one alert or notification. Event can also be a generic term used to refer to an incident, change request, message, or other specific item within the management system. Whenever possible, these situations are referred to using the management system's preferred terminology, but can also collectively be called events.
Management system	A management system is any sort of IT service management software with which xMatters can combine; i.e., a synonym for Netcool/OMNIbus.
Device	The medium through which a recipient is contacted by xMatters; i.e., email, pager, phone, BlackBerry, etc.
User	In xMatters, people who can receive notifications are called "Users". Each person in the xMatters system is defined by a set of User details, including ID number, user name, login password, and so on.
Group	Groups are used to collect and organize Users and Devices into notification schedules. For a complete explanation of Groups in xMatters, see the *xMatters user guide*.

Chapter 2: Installation and Configuration

This chapter provides information about installing the xMatters (IT) engine for IBM Tivoli Netcool/OMNIbus integration. This chapter also contains complete instructions on how to configure xMatters, Netcool/OMNIbus, and the integration components.

2.1 Installing the integration

This section describes the installation process for the xMatters (IT) engine for IBM Tivoli Netcool/OMNIbus integration.

This integration includes the following components that must be modified for each deployment:

Component Name	Description
xM-IBM-Tivoli-Netcool.xml	Contains the Event Domain, Event Domain Constants, and the integration script package.
ibmnetcool-config.js	The JavaScript configuration file that defines the integration service on the integration agent.
xmatters.elc	An updated version of the Netcool/OMNIbus "Event List" panel that includes the XMState, XMResponder, XMTarget, and XMLastUpdated fields used by the integration.
Netcool-APClient.bat	Used by the integration to send commands to the integration agent either create or delete an event for a related alert in Netcool/OMNIbus

2.1.1 Installing the integration service

To install the integration service, you must perform the following steps:

- Copy the folder containing the integration components into the integration agent; this process is similar to patching the application, where instead of copying files and folders one by one, you copy the contents of a single folder directly into the integration agent folder (`<IAHOME>`). The folder structure is identical to the existing integration agent installation, so copying the folder's contents automatically installs the required files to their appropriate locations. Copying these files will not overwrite any existing integrations.
- Modify the integration agent's `IAConfig.xml` file to include the paths for the new integration service.
- Modify the variables in the `ibmnetcool-config.js` file associated with the integration service.

If you have more than one integration agent providing the Netcool/OMNIbus service, repeat the following steps for each one.

Note: *If you have already installed an existing integration, ensure that you backup the deduplicator-filter.xml file (if one exists) in the* `<IAHOME>\conf` *folder before you install this integration*

To install the integration services:

1. Copy all of the contents of the `\components\integration-agent` folder from the extracted integration archive to the `<IAHOME>` folder.
2. Open the `IAConfig.xml` file found in `<IAHOME>\conf` and add the following line to the "service-configs" section:

`<path>ibmnetcool/ibmnetcool.xml</path>`

3. Open the `ibmnetcool-config.js` file (now located in the `<IAHOME>\integrationservices\ibmnetcool` folder, and set the values for the following variables:

Variable	Description
OMNI_os_host	Name or IP address of the server hosting the Netcool/OMNIbus ObjectServer.
OMNI_os_port	Port on which the Netcool/OMNIbus ObjectServer is running.
OMNI_os_method	Method used to communicate with the ObjectServer's Sybase database.
OMNI_NetcoolUser	The name of the ObjectServer xMatters user.
OMNI_UID	The ObjectServer password for the ObjectServer xMatters user.

Note: *The OMNI_NetcoolUser and OMNI_UID, and XMDT_netcool_password variables are set in the installation SQL. Use the default values if the user information has not been changed.*

4. Restart the integration agent.
   - On Windows, the integration agent runs as a Windows Service.

2.1.2 Installing the subscription files

To use the optional subscription panel, you must copy the JSP files into the xMatters installation folder. If you have more than one web server, repeat the following steps for each one.

To install the JSP files:

1. Copy the `\components\xmatters\sub-panel\jsp\ibmnetcool` folder from the extracted integration archive into `<xMHOME>\webserver\webapps\cocoon\alarmpoint\jsp\subscription`.

2.1.3 Installing voice files

These files must be installed into any xMatters deployment running a voice Device Engine. For more information, refer to the *xMatters installation and administration guide*.

This integration provides a complete set of English voice files.

Note: *xMatters version 4.1 and 5.0 store voice files in different locations; ensure that you use the correct set of instructions for your version of xMatters.*

To install the voice files on xMatters version 4.1:

1. Copy all of the files in the `\components\xmatters\vox\bmcremedy\recordings\english\phrases` folder from the extracted integration archive to the following node installs folder:

   `<xMHOME>\node\phone-engine\Datastore\domains\common\recordings\english\phrases`

To install the voice files on xMatters version 5.0:

1. Determine the value of the File Identifier associated with your Company.
   - To find your Company's File Identifier, log into the xMatters web user interface as the Super Administrator, and view the target Company's Details page (**Admin** tab **> Companies > Company name**).
2. Copy the contents of the `\components\xmatters\vox\` folder from the extracted integration archive to the following node installs folder:

   `<xMHOME>\node\phone-engine\Datastore\<FILE_IDENTIFIER>\`

For example, if you were installing the integration for the Default Company on an out-of-the-box deployment, the installation path for the voice files would be as follows:

   `<xMHOME>\node\phone-engine\Datastore\1\bmcremedy\recordings\english\phrases`

2.2 Configuring Netcool/OMNIbus

Configuring Netcool/OMNIbus to combine with xMatters requires the following steps:

- Set the appropriate environment variables
- Update the database
- Configure the xMattersEvent and xMattersDelEvent procedures
- Configure the xMatters_auto_dispatch_trigger
- Add xMatters users and groups

2.2.1 Pre-configuration

This section identifies configuration steps that you can perform on your Netcool/OMNIbus deployment before configuring the integration.

Installing new Event Viewer

This integration includes an `xmatters.elc`, which is a replacement version of the default Netcool/OMNIbus Event List. The new version includes the fields used by the integration to identify alert information required by the integration settings.

To install the new panel, copy the `xmatters.elc` file from the extracted integration archive to a location on the classpath of the Netcool/OMNIbus machine.

Installing the event injection wrapper

The `Netcool-APClient.bat` file is used to send either a "Del" injection to the del Integration Service or an alert injection to the ibmnetcool Integration Service.

Copy the `Netcool-APClient.bat` file from the extracted integration archive to the `<IAHOME>\bin` folder..

Connection watch triggers

This integration creates connection watch alerts whenever the integration agent uses JDBC to access the Netcool/OMNIbus Sybase database. These alerts can be turned off in the Netcool/OMNIbus Administrator.

To disable the connection watch triggers:

1. In Netcool/OMNIbus Administrator, click **Automation > Triggers**.
2. In the Triggers list, open the **connection_watch_connect** trigger.
3. In the Edit Signal Trigger dialog box, clear the **Enabled** check box, and then click **OK**.
4. Repeat the previous step for the connection_watch_disconnect trigger.

Checking the Process Agent

If the Netcool/OMNIbus server cannot access the Process Agent, check the Process Agent name and password settings to ensure they are correctly configured.

To check the Process Agent:

1. Open the Netcool/OMNIbus Administrator and click **System > Properties**.
2. Locate the following settings:
   - **PA.Name**
   - **PA.Password**
   - **PA.Username**

3. Ensure that these settings are the same as the user who starts and runs the NCO_PA application.

2.2.2 Setting environment variables

After you complete the pre-configuration steps, the first task is to configure the environment variables on your Netcool/OMNIbus machine.

On Windows:

- Add a global environment variable named IA_HOME set to the integration agent installation directory.
- Append the IA_HOME environment to the system PATH environment variable.
- If it does not already exist in the Global or PATH variable, create a global environment variable named JAVA_HOME and set it to the `\jre` directory within the integration agent installation folder. Note that when adding to the path, it must include the `bin` directory: `path=...….%IA_HOME%\bin;%JAVA_HOME%\bin;`
  - This is used for the Data Synchronization portion of the integration.
- Append JAVA_HOME to the system PATH environment variable.

On Unix:

- For each user running Netcool/OMNIbus, add an environment variable named IA_HOME and set it to the integration agent installation directory.
  - As an alternative, you could set a global environment variable accessible to all Users.
- Append the IA_HOME environment variable to the PATH environment variable of the user under which Netcool/OMNIbus runs.
- Add an environment variable named OMNIHOME set to the Netcool/OMNIbus installation directory.
- Append `$OMNIHOME/bin` to the PATH environment variable of the user under which Netcool/OMNIbus runs.
- If it does not already exist in the Global or PATH variable, create a global environment variable named JAVA_HOME and set it to the `/jre` directory within the integration agent installation folder. Note that when adding to the path, it must include the `bin` directory: `path=...….%IA_HOME%\bin;%JAVA_HOME%\bin;`
  - This is used for the Data Synchronization portion of the integration.
  - Setting this environment variable is a required pre-installation step for xMatters version 5.0, and should already have been configured on a 5.0 deployment.
- Append JAVA_HOME to the PATH environment variable of the user under which Netcool/OMNIbus runs.

2.2.3 Updating the database

The first required step to configure Netcool/OMNIbus for this integration is to update the database.

To update the Netcool/OMNIbus database:

1. Back up the `%OMNIHOME%\db\<ObjectServerName>` directory (optional).
2. Change your working directory to `%OMNIHOME%\bin`.
3. Run the `%OMNIHOME%\bin\Netcool-updates.bat` script, passing the following parameters:
   - ObjectServer name
   - ObjectServer user name (must have ISQL Writer permissions)
   - Password for ObjectServer user name (can be null)

For example:

```
Netcool-updates.bat NCOMS user password
```

If the update is successful, you should see a message indicating that 31 rows were affected, and you should be able to verify that the database was updated correctly based on the changes in the SQL file.

Results

Updating the database results in the following changes to the Target ObjectServer tables:

- alerts.status:

```
XMState:               integer
XMTarget:              varchar(64)
XMResponder:           varchar(64)
XMLastUpdated:         UTC
```

- An additional number of conversions are inserted for XMState:

```
0:      New
1:      Marked For Dispatch
2:      Dispatched
3:      Delivered
4:      XM_Acknowleged
5:      Escalated
6:      Ignored
7:      Cancelled
8:      XM_Ignored
9:      XM_Owned
```

- One additional ObjectServer user with ISQL Write permissions is created:

```
User name:            xmatters
Password:             xmatters
User ID:              99999
Group member of:      System, ISQL & ISQL Write
```

- One additional Group is created: xMattersNetcoolGroup.
- One additional User is created in that Group: Bob Smith.
- xMatters prompts, tools, and menus are created:

```
xMatters Prompts, Tools, Menus
Dispatch to xMatters Users
Dispatch to xMatters Groups
Stop all xMatters Notifications for this Event
```

- One additional trigger Group is created:

```
xmatters_triggers
```

- Additional external procedures are created:
    - **xMattersEvent**: calls the Netcol-APClient.bat command line to inject events into xMatters
    - **xMattersDelEvent**: calls Netcol-APClient.bat to send "del" events into xMatters
- Three additional temporal triggers are created:
    - **xMattersEvent**: checks for events marked for dispatch and injects them into xMatters
    - **xMatters_auto_dispatch_trigger**: automatically dispatches an event to xMatters if the Severity is Major or higher for events which are not acknowledged and have a XMState of "new"
    - **xMatters_del_automated_trigger**: Sends a del request into xMatters when an event is deleted to stop all notifications within xMatters

2.2.4 Configuring procedures

The procedures created by the integration need to be updated to include the IP address of the Netcool/OMNIbus server.

To edit the procedures:

1. Open the Netcool/OMNIbus Administrator.
2. Connect to the ObjectServer to use for xMatters events.
   - This ObjectServer must have the xMatters SQL installed.
3. Expand the **Automation** section in the left menu, and then select **Procedures**.
4. Double-click **xMattersEvent**.
5. In the **Host** field, replace "localhost" with the IP address of Netcool/OMNIbus server:
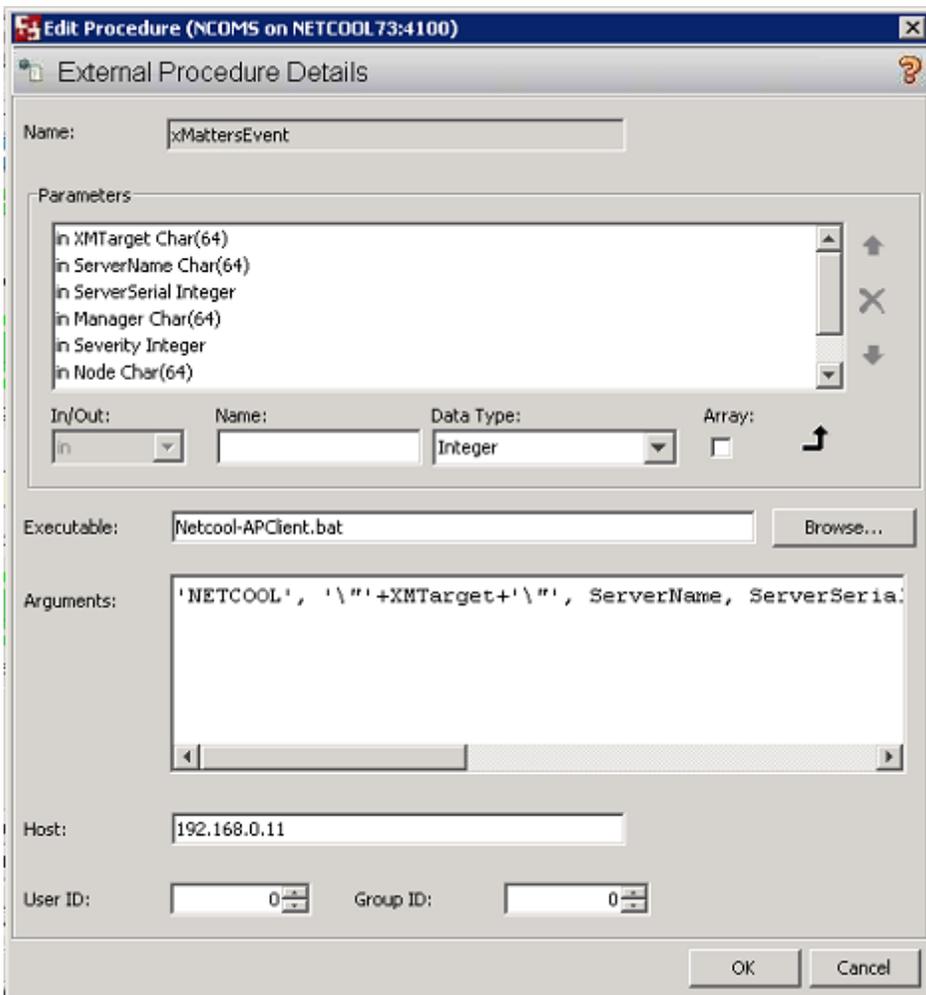
1. Double-click **xMattersDelEvent**.
2. In the **Host** field, replace "localhost" with the IP address of Netcool/OMNIbus server:
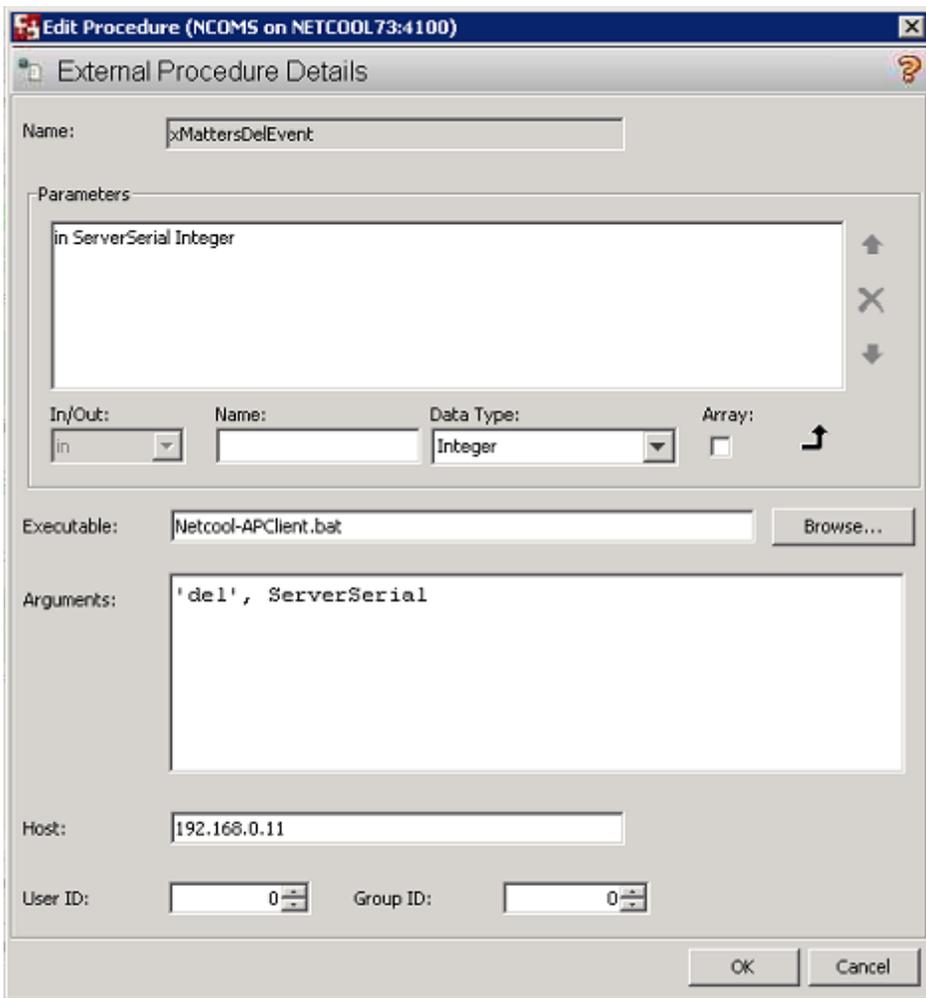
2.2.5 Configuring event trigger

The default integration trigger is configured to send events into xMatters if an alert has a Severity of 4 (Major) or higher, is not "acknowledged", and has an XMState of "0" (which equals new). The trigger is also configured to target the "xMattersUsers" group created in the Netcool/OMNIbus database.

You can edit this trigger to change when alerts are sent into xMatters for notification.

To configure the event trigger:

1. In the Netcool/OMNIbus Administrator, expand the **Automation** section in the left menu, and then select **Triggers**.
2. Double-click **xMatters_auto_dispatch_trigger**.
3. Edit the trigger to modify the conditions under which alerts are sent to xMatters.
   - To change the targeted recipient, change "xMattersUsers" to a valid xMatters User or Group ID.
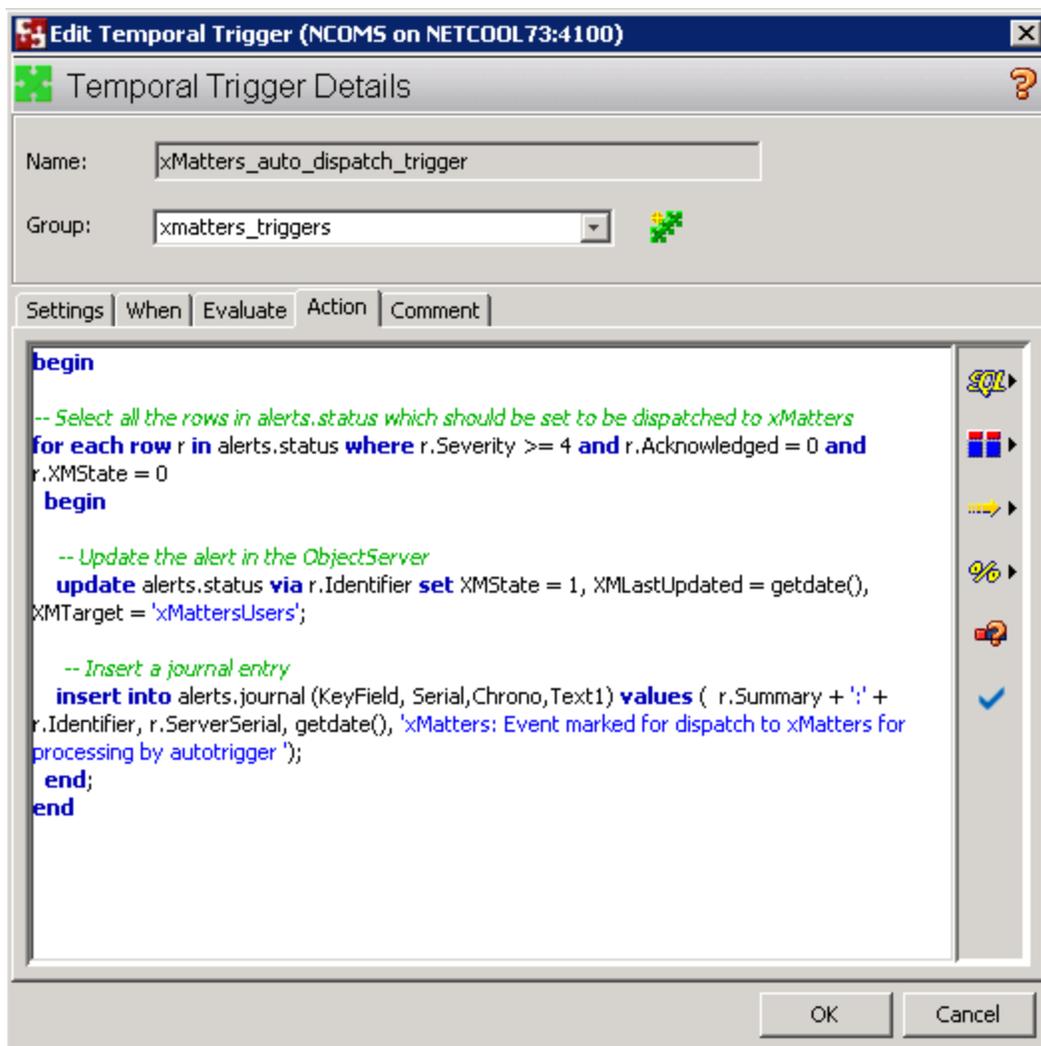
4. Click **OK**.

2.2.6 Adding users and groups

Use the following steps to create a user or group inside Netcool/OMNIbus that can be targeted by xMatters notifications.

To create a target user:

1. Open the Netcool/OMNIbus Administrator Application.
2. Log into the Object Server.
3. Open the User section and click **Users > Add User**.
4. Specify a **Username** and **Full Name** for the user.
5. Select the xMattersUsers group and add it to the user's Assigned Groups.
6. Click **OK**.

To create a target group:

1. In the User section of the Object Server, click **Groups > Add Group**.
2. Type a **Group Name** and **Description** for the new Group.
3. Select the xMattersGroup role and add it to the group's Applied Roles.
4. Click **OK**.

Note: *If a User or Group is created while the Netcool/OMNIbus Event List is open, the Event List must be closed and reopened before events can be dispatched to the new User or Group.*

2.3 Configuring xMatters

Configuring xMatters to combine with Netcool/OMNIbus requires the following steps:

- Import the Event Domain and define the integration service
- Configure the Web Services User
- Configuring a Subscription Domain and Subscriptions
- Review and configure the response choices

2.3.1 Importing Event Domain and scripts

The integration package includes an XML file that was created using the xMatters "Export Integration" feature; this greatly simplifies the xMatters configuration process by enabling you to create the integration Event Domain, configure the predicates and Event Domain Constants, and import the integration script package in a single step.

To import the integration Event Domain package:

1. Log in to xMatters as a Company Administrator, and click the **Developer** tab.
2. On the Event Domains page, click **Import New**.
3. On the Import Integration page, click **Browse**, and then locate the `\components\xmatters\event-domain\xM-IBM-Tivoli-Netcool.xml` file extracted from the integration archive.
4. Click **Open**, and then click **Upload**.

xMatters imports the integration configuration settings and displays the new "ibm_netcool" Event Domain. xMatters also creates the predicates for the Event Domain, and assigns common values as defaults. For more information about the created predicates, and instructions on how to modify them, see "Defining Event Domain predicates" on page 37.

Defining the integration services

For the installation to be successful, the integration service name must match the name specified in the `ibmnetcool.xml` file installed on the integration agent.

To define an Integration Service:

1. In xMatters, on the Event Domains page, click the **ibm_netcool** Event Domain.
2. On the Event Domain Details page, in the Integration Services area, click **Add New**.
3. Enter the following information into the form:
   - **Name**: ibmnetcool
   - **Description**: IBM Tivoli Netcool/OMNIbus Integration Service
   - **Path**: *Not required. (This field is used by the xMatters mobile access component, which is not included in this integration.)*
4. Click **Save**.

Specifying connection parameters

Once you have imported the Event Domain package and configured the Integration Service, you must specify an xMatters address that is reachable from within a notification so that responses can be processed.

Note: *A known issue in xMatters version 5.0 requires that all Event Domain Constants be defined in UPPERCASE.*

To specify the connection constants:

1. On the Event Domains page, in the Domains menu, click **Event Domain Constants**.
2. In the **Event Domain** drop-down list, select **ibm_netcool**, and then click **Continue**.
   - xMatters displays the pre-configured Event Domain Constants for the integration:
3. In the Event Domain Constants list, specify the correct values for the following constants (click the name of a constant to edit its value and description):

Event Domain Constants

Constant Name	Default Value	Description
XMATTERSURL	http://localhost:8888	Used to specify the address of the xMatters web server. The links provided in notification content use this value to locate the xMatters web server which would process the response. For these links to work, this address must be reachable from the Device where the User will receive the notification; normally, this is the IP address or fully-qualified host name of the xMatters web server.
BESPUSHURL	http://localhost:8888/static	Used to specify the address of the BES device server.
TRACKDELIVERY	true	Track when each device is delivered to. Setting this to false may give a performance advantage, but you will lose any information about whether a delivery was successful or not.
MAINLOGO	/static/images/xmatters/logos/xmatters_email.gif	Specifies the location of the xMatters logo displayed in email notifications.
		Note: This field not added as part of the Event Domain import process; it is required only on xMatters 4.1 deployments. You must add this constant using the tools on the Event Domain Constants page to have the xMatters logo appear as expected.

Note: *For more information about the Event Domain Constants included in the integration and how to configure them to suit your deployment, see "Defining Event Domain Constants" on page 34.*

2.3.2 Configuring the default User

By default, this integration uses a default demonstration User named "bsmith". Follow the steps below to ensure that this User has a virtual two-way text phone Device.

To configure the default User:

1. In xMatters, click the **Users** tab.
2. On the Find Users page, click **S**.
3. In the list of returned Users, click **Smith, Bob**.
4. In the Common Tasks pane, click **User Devices**.
5. Verify that a virtual text phone Device exists.

6. Click **Reorder**, and set the virtual text phone to be the first Device in the list.
7. Click **Save**.

Note: *If this user is missing, create a User with the User ID "bsmith", and add a virtual text phone Device. For more information and instructions on how to perform these tasks, refer to the* xMatters user guide.

2.3.3 Creating a Netcool/OMNIbus Administrator

The data synchronization feature requires an xMatters supervisor for new Users, Teams, and Groups. This supervisor must be an active User assigned to the Person Supervisor and Group Supervisor Roles. The following instructions describe how to create a supervisor with a User ID of "netcooladmin", which is the default value in the synchronization configuration file included with the integration. If you specify a different User ID, you will need to change the default value in the configuration file.

To create a synchronization administrator:

1. In the xMatters web user interface, click the **Users** tab.
2. In the Users menu on the left side of the screen, click **Add User**.
3. On the Add a User page, enter the following information into the form:
   - **User ID**: netcooladmin
   - **First Name**: Netcool
   - Last Name: Admin
4. In the **Available Roles** list, select **Standard User**, **Person Supervisor**, and **Group Supervisor**, and then click **Add**. (**Ctrl-click** to select more than one Role in the list.)
5. Click **Save**.
6. On the Change Web Login page, provide a password for the Netcool Admin and then click **Save** to create the User.

For more information about these tasks, refer to the *xMatters user guide*.

2.3.4 Adding the Web Service User

This integration requires an xMatters Web Service User for processing of events before being injected into xMatters using web services. The following steps describe how to configure the default Web Service User, IA_User, for this integration.

To set up a Web Service User:

1. In xMatters, click the **Users** tab, and then click **Find Web Service Users**.
2. On the Find Web Service Users page, click **All**.
3. In the returned search results, click **IA_User**.
4. On the Details for IA_User page, confirm that the list of **Allowed Web Services** includes the following web services; if any of the following are not listed in the Allowed Web Services list, select them in the **Denied Web Services** list (Ctrl-click to select more than one), and then click **Add**:
   - Add Coverage
   - Add Device
   - Add Group
   - Add Team
   - Add User
   - Delete Group
   - Delete Team
   - Delete User

- Delete Device
- Find Devices
- Query Group
- Query Incident
- Query User
- Update Coverage
- Update Device
- Update Group
- Update Team
- Update User

5. Click **Save**.

2.3.5 Subscribing to alerts

You can use the Subscriptions feature in xMatters to subscribe to Netcool/OMNIbus alerts that match specific criteria. For example, you could configure a subscription that would send an informational notification to a specific User each time an event entered the system that was of "Immediate" urgency, or whenever an event's status was changed to "Resolved".

To allow Users to subscribe to specific criteria on injected events, you must configure the Subscription using the following steps:

- Define a Subscription Domain
- Configure the Subscription Panel (Optional)
  - This integration includes a custom Subscription panel that populates certain fields on the panel based on settings in your Netcool/OMNIbus deployment. If you choose not to use the custom panel, you can still create Subscriptions using the default Subscription panel included with xMatters.
- Create a Subscription
- Create a Fail-Safe Group

Defining a Subscription Domain

The Subscription Domain is the reference point that allows you to control who can create Subscriptions, how recipients can respond to Subscription notifications, and which Event Domain predicates can be used to create a Subscription. You must create a Subscription Domain before you can create Subscriptions.

For a list of the Event Domain predicates included with the default integration, see "Defining Event Domain predicates" on page 37.

To create a Subscription Domain:

1. On the Developer tab, in the Domains menu, click **Subscription Domains**.
2. On the Subscription Domains page, click the **Add New** link.
3. In the **Event Domain** drop-down list, select **ibm_netcool**, and then click **Continue**.
4. On the Subscription Domain Details page, in the **Name** field, type `Netcool`.
   - By default, Subscriptions are non-FYI (i.e., they support response options). To disable two-way Subscription notifications, select the **One-Way** check box.
5. Click **Continue**.
6. On the Select Appropriate Response Choices page, specify the available responses for this Subscription, and then click **Continue**.
   - By default, the scripts support the following response choices: "Acknowledge", "Ignore", and "Annotate". To enable two-way communications for Subscriptions, define all of the response choices on the Select Appropriate

> Response Choices page. If you require only one-way, informational notifications, do not specify any response choices.

7. On the Select Appropriate Predicates page, add all of the predicates to the **Applied Predicates** list, and then click **Continue**.
8. On the Select Roles page, specify the Roles you want to be able to create Subscriptions on the Domain, and then click **Save**.

Note: *For more information about working with Event and Subscription Domains, see the* xMatters installation and administration guide.

Configuring the Subscription JSP

You can use one of the following methods to populate the predicate list values on the Subscription Panel:

- Manually specify the predicate list values in the web user interface.
- Using web services, query Netcool/OMNIbus for possible values, and automatically populate the predicate lists with the results of the web service call.

Note: *Changing Subscriptions by adding or removing Event Domain predicates may cause existing Subscriptions to fail. For more information about working with Event and Subscription Domains, see the* xMatters installation and administration guide.

Specifying predicate lists manually

To configure the Subscription panel in a demonstration mode, using predefined predicate list values, you must modify the Subscription JSP.

To manually populate the predicate lists:

1. Open the `NetcoolOMNIbusSubscriptionForm.jsp` found in the `<XMHOME>\webserver\webapps\cocoon\alarmpoint\jsp\subscription\ibmnetcool` folder on the xMatters web server install.
2. Set the following Boolean variables to *true*:

```
USE_PREDICATE_VALUES_FOR_NODE
USE_PREDICATE_VALUES_FOR_MANAGER
USE_PREDICATE_VALUES_FOR_ALERT_GROUP
```

3. Save and close the `NetcoolOMNIbusSubscriptionForm.jsp` file.
4. In xMatters, click the **Developer** tab.
5. On the Event Domains page, click **ibm_netcool**.
6. On the Event Domain Details page, in the Predicates list, click the name of the predicate for which you want to define the values.
7. Add to the predicate list values, and then click **Save**.
8. Repeat steps 6 and 7 for each predicate to which you want to assign values.

The predicate lists on the Subscription will now be populated with the predefined list values instead of the web service call results.

Populating predicate lists automatically

If you want to populate the predicate values lists from Netcool/OMNIbus through web service calls rather than the predefined predicate list values, you must configure the connection properties within the JSP file.

To configure the Subscription JSP to connect through web services:

1. Open the `NetcoolOMNIbusSubscriptionForm.jsp` found in the `<XMHOME>\webserver\webapps\cocoon\alarmpoint\jsp\subscription\ibmnetcool` folder on the xMatters web server install.

2. Within the Subscription JSP, locate the following section:

```
String OMNI_os_host = "localhost";
String OMNI_os_port = "4100";
String OMNI_os_method = "jdbc:sybase:Tds:";
String OMNI_os_constr = OMNI_os_method + OMNI_os_host + ":" + OMNI_os_port;
String OMNI_NetcoolUser = "xmatters";
String OMNI_UID = "99999";
String APDT_netcool_password = "xmatters";
```

3. Replace the value within quotes for each parameter as described in the following table:

Parameter	Value
OMNI_os_host	IP address of the hardware hosting ObjectServer. • Ensure that you include the final colon.
OMNI_os_port	Port number used by JDBC to connect the ObjectServer SYBASE database.
OMNI_os_method	Connection method used by JDBC to connect to the ObjectServer.
OMNI_NetcoolUser	ObjectServer user with ISQL write permissions
OMNI_UID	User ID for the ObjectServer user with ISQL write permission
APDT_netcool_password	Password for the ObjectServer user with ISQL write permission

4. Save and close the JSP.

Creating a Subscription

You can now subscribe to Netcool/OMNIbus events that match specific criteria. For example, you could configure a subscription that would send an informational notification to a specific User each time an event entered the system that was of critical severity.

If you configured the optional Subscription Panel, you can use it to create your Subscriptions.

To create a Subscription using the Custom Subscription Panel:

1. In xMatters, on the Alerts tab, click **My Subscribed Alerts**.
2. In the **Subscription Domain** drop-down list, select **Netcool**, and then click **Continue**.
3. On the Subscription Details page, specify a **Name** for the Subscription.
4. Set the Subscription criteria using the **Netcool Events** tab:

Attributes

| Netcool Events | Preferences |

Node:
```
-- ANY --
vic-esx-nc721
VIC-ESX-NC721
```

Manager:
```
-- ANY --
Unknown Application
Administrator
isql
Windows Event List
```

AlertGroup:
```
-- ANY --
ConnectionWatch
```

Severity:
```
-- ANY --
Critical, 5
Major, 4
Minor, 3
Warning, 2
```

[Save]

5. Click the **Preferences** tab to define the time frames and overrides you want to apply to the Subscription:

Attributes

| Netcool Events | Preferences |

Timeframe

Start Time: `08:00` `9` hours `0` minutes *
Timeframe ending the same day at 17:00.
On the following days: ☐ Sun ☑ Mon ☑ Tue ☑ Wed ☑ Thu ☑ Fri ☐ Sat
Time Zone: `Canada/Pacific`

Overrides

Device Types: ☐ All Devices ☑ Email ☑ Instant Message ☑ Text Devices ☐ Voice Devices
Override User Device Timeframes: ☐
Ignore Device Delays: ☐
Override Device Severities and Use All: ☐
Notification Delay: `0` min

[Save]

6. Click **Save** to create the Subscription.
   - You can review the Subscription details at any time on the **Summary** tab:

Creating a fail-safe Group

If an event is submitted to xMatters when the fail-safe functionality is enabled, and there is no subscription that matches the event, xMatters sends the notification to the fail-safe recipient. The fail-safe recipient is typically a Group, but can be configured as a User.

To create a fail-safe Group:

1. In xMatters, click the Groups tab.
2. Create a new Group named Netcool Fail Safe, with at least one User as a Team member to receive notifications.

For more information about creating Groups and Teams, see the *xMatters user guide*.

Note:	*If you want to use an existing Group or a different Group name, modify the value for the failsafegroup Event Domain Constant. You can also eliminate notifying any fail-safe group by setting the failsafe constant to disabled. For more information, see "Defining Event Domain Constants" on page 34.*

2.4 Configuring synchronization

This integration supports one-way synchronization Groups, Teams, Users, and Coverages from Netcool/OMNIbus into xMatters. To configure the synchronization process for your deployment, modify the following configuration files included with the integration:

- `xMattersSyncConfig.properties`: defines the configuration and connection values for the integration agent, xMatters web services, and Netcool/OMNIbus.
- `group.properties`: defines the default values for synchronized Groups, Teams, and Coverages.
- `person.properties`: defines the default values for synchronized Users.

The synchronization is provided using JDBC calls into Netcool/OMNIbus to retrieve those users and groups that are marked for synchronization with xMatters. The following sections provide an overview and technical description of this process, and describe how to modify the configuration to suit you business behavior.

Netcool/OMNIbus users, groups, and group members will be synchronized to xMatters only when they are configured within Netcool/OMNIbus as an xMatters User or Group:

- For a Netcool/OMNIbus user to be considered an xMatters User, they must be in the "xMattersUsers" group.
- For a Netcool/OMNIbus group to be considered an xMatters Group, they must have the xMattersGroup role.

2.4.1 Synchronization configuration file

The `xMattersSyncConfig.properties` synchronization configuration file contains the following parameters:

```
.### Common Properties ###
xm_ia_url=http://localhost:2010/agent
xm_ia_service=ibmnetcool
xm_ia_action_script=ibmnetcool
xm_webservice_host=localhost
xm_webservice_port=8888
xm_webservice_user=wsuser
xm_webservice_password=password
### Administrator's XM UserID to be contacted for Synchronization Errors
netcool_administrator=netcooladmin
### Netcool Properties ###
OMNI_os_host=localhost:
OMNI_os_port=4100
OMNI_os_method=jdbc:sybase:Tds:
OMNI_netcool_user=xmatters
OMNI_netcool_password=xmatters;
OMNI_UID=99999
```

Replace the value for each parameter with the specific value for your deployment, as explained in the following table:

Parameter	Value
xm_ia_url	IP address of the integration agent
xm_ia_service	Name of the integration service used by the integration.
xm_ia_actionscript	Name of the script package used by the integration.
xm_webservice_host	IP address of the xMatters web server (used to access the web services)
xm_webservice_port	Port at which the xMatters web server can be accessed (the default for most xMatters deployments is 8888)
xm_webservice_user	User ID of the Web Service User used toi inject Netcool/OMNIbus events into xMatters
xm_webservice_password	Web Service User's password.
netcool_administrator	User ID of the xMatters administrator to be contacted in the event of any synchronization errors. This is the same User configured in "Creating a Netcool/OMNIbus Administrator" on page 16.
OMNI_os_host	IP address of the hardware hosting the ObjectServer. Ensure that you include the final colon in the variable; it is required when constructing the URL used to communicate with Netcool/OMNIbus.
OMNI_os_port	Port number used by JDBC to connect to the ObjectServer Sybase database.
OMNI_os_method	Connection method used by JDBC to connect to the Object Server.
OMNI_netcool_user	ObjectServer User with ISQL write permission.
OMNI_netcool_password	Password for the ObjectServer User with ISQL write permission.
OMNI_UID	User ID for the ObjectServer User with ISQL write permission.

2.4.2 Default values

The `person.properties` and `group.properties` files included with the integration have default values to use for each object type, but can be customized to use different values for a specific instance of an object.

Each default element must specify a value for all possible fields (refer to the following section for a complete list of possible fields). This integration is seed-only, which means that the object will only be added to xMatters when it is initially synchronized and is not updated on subsequent synchronizations.

Note: *All objects within the .properties files must remain in place; the synchronization will fail if any elements are removed.*

To specify a default synchronization value, set a default value for one of the fields listed in the tables below:

- **default**: the value for this field
- **field**: the column in this table to apply the regular expression

For example, to set the default value for the User Supervisor:

```
default.supervisor=netcooladmin
```

2.4.3 Object-specific values

All object-specific elements from Netcool/OMNIbus will override any default value element. The following table lists the object-specific elements in Netcool/OMNIbus and their equivalent properties in xMatters.

Netcool/OMNIbus Element	xMatters Element
Username	User ID
Full Name	First Name, Last Name
Group Name	Group Name
Description	Description

The fields listed in the following tables use the default values defined in the properties files:

User configuration fields

Field	Description	Possible Values
active	Whether this User is active	true, false
first-name	User's first name	Any string
last-name	User's last name	Any string
has-mobile-access	Mobile access flag	true, false
site	User's Site	Valid xMatters Site name
language	User's language	Valid xMatters language
timezone	User's time zone	Valid xMatters time zone
role	User's xMatters Role	Valid xMatters Role

Field	Description	Possible Values
supervisor	User's xMatters supervisor	Valid xMatters User target name (must be a User Supervisor or the synchronization will fail)
ldap-domain	User's web login LDAP domain	Valid xMatters LDAP domain
web-login	User's web login	Always set to the Netcool/OMNIbus Username
web-password	User's web login password	Any string
web-login-type	Defines whether the web login is a native xMatters login or an LDAP authentication	NATIVE, LDAP

Groups configuration fields

Field	Description	Possible Values
description	Group's description	Any string
timezone	Group's time zone	Valid xMatters time zone
site	Group's Site	Valid xMatters Site
active	Whether this Group is active	true, false
allow-duplicates	Allow duplicates flag	true, false
externally-owned	Externally owned flag	true, false
observed-by-all	Observed by all flag	true, false
observer	Target name of a User to be the Group's observer	Valid xMatters User target name
supervisor	Target name of a User to be the Group's supervisor	Valid xMatters User target name (must be a Group Supervisor or the synchronization will fail
use-default-device	Use default Device flag	true, false

Team configuration fields

Field	Description	Possible Values
suffix	Team name is generated by the Group name and the suffix	Any string not containing '|'
description	Description for the Team	Any string
externally-owned	Externally owned flag	true, false
reuse	Reuse Team flag	true, false

Field	Description	Possible Values
rotation-interval	Rotation interval (only used if type is ROTATION)	Integer value
rotation-start	Rotation start date (only used if type is ROTATION)	Date in the format 'dd/mm/yyyy h:mm:ss AM/PM'
rotation-unit	Rotation units (only used if type is ROTATION)	DAYS, MONTHS, WEEKS
type	Team type	BASIC, EVENT_ROUND_ROBIN, ROTATION
member-type	Team member type (should leave as PERSON for the integration)	PERSON, GROUP, TEAM, DEVICE
member-delay	Delay between Team members	Integer value
member-in-rotation	Are Group members in the rotation	true, false

.

Coverage configuration fields

Field	Description	Possible Values
suffix	Coverage name is generated by the Group name and the suffix	Any string not containing '|'
start-time	Start time for this shift	Time in the format "hh:mm"
duration-hours	Hours duration of the shift	Integer value $0 <= N <= 24$
duration-minutes	Minutes duration of the shift	Integer value $0 <= N <= 60$
exclude-holidays	Exclude holidays flag	true, false
sunday	Coverage on Sunday	true, false
monday	Coverage on Monday	true, false
tuesday	Coverage on Tuesday	true, false
wednesday	Coverage on Wednesday	true, false
thursday	Coverage on Thursday	true, false
friday	Coverage on Friday	true, false
saturday	Coverage on Saturday	true, false
recurrence-end-date	End date for the coverage	Time in the format dd/mm/yyyy h:mm:ss AM/PM
recurrence-frequency	Frequency of the recurrence	DAILY, WEEKLY, MONTHLY
recurrence-interval	Interval of the recurrence	Integer value

Field	Description	Possible Values
recurrence-no-end-date	No end date flag	true, false
recurrence-occurences	Number of recurrences for this coverage	Integer value
recurrence-start-date	Start date of the recurrence	Time in the format dd/mm/yyyy h:mm:ss AM/PM

Chapter 3: Integration Validation

After configuring xMatters and Netcool/OMNIbus, you can validate that communication is properly configured. Before testing, ensure that you restart all of the components to ensure that the environment variables are properly initialized.

It is recommended that you start the components in the following order:

- IBM Tivoli Netcool/OMNIbus
- xMatters relevance engine
- xMatters integration agent

Consult the respective user manuals for details on starting these applications.

The following sections will test the combination of xMatters and Netcool/OMNIbus for notification delivery and Subscription functionality.

3.1 Validating synchronization

The following validates that communication from Netcool/OMNIbus to xMatters is properly configured for data synchronization.

To launch the data synchronization, run the following file:

```
<IAHOME>\NetcoolDatasync\XMNetcoolDatasync.bat
```

In batch case, the results of the operation are sent to the console of the command prompt from which you are running the synchronization. Depending on the success or failure of the operation and the configuration of the service, a notification may be sent to an xMatters User specified as the target for results messages (default is "netcooladmin").

3.2 Triggering a notification

The following steps test end-to-end connectivity between xMatters and Netcool/OMNIbus. Note that while this section uses a virtual BlackBerry Device to illustrate the notification and response, any validated Device can be used to the respond to the notification.

(Note that while the following steps describe how to test automatic notifications, you can also manually trigger a notification by right-clicking an existing alert in Netcool/OMNIbus, and then selecting **Tools > Dispatch to xMatters**.)

To trigger a notification:

1. Launch the included `xmatters.elc` file.
2. Create a new alert within Netcool/OMNIbus with a Severity of High or Critical to match the automated trigger rule.
    - For example, attempt to log in using an incorrect user name and password combination. The system will return an error message indicating that it failed to connect to the login server. Then log in using a valid user name and password.
3. Netcool/OMNIbus creates a new alert with an XMState of "Dispatched":

3.3 Responding to a notification

This section describes how to respond to a notification from xMatters. In the following example, the notification is received on a simulated BlackBerry Device, but the process is similar for all Devices.

To respond to a notification:

1. When a notification arrives for the User, the Device indicates the number of calls received:

2. Opening the notification displays its details:

3. Scrolling down will display the remainder of the details, and the list of possible replies:

4. To respond to the notification, the User clicks a response choice, and xMatters updates the alert in Netcool/OMNIbus.

For more information about response choices, and changing the options available to Users, see "Response choices" on page 37.

3.4 Viewing response results

In Netcool/OMNIbus, the results of the notification are displayed in the Netcool/OMNIbus operator interface; the alert is marked with the user's response and the XMResponder field is updated:


You can see the progress and details of the notification on the Journal tab for the alert:
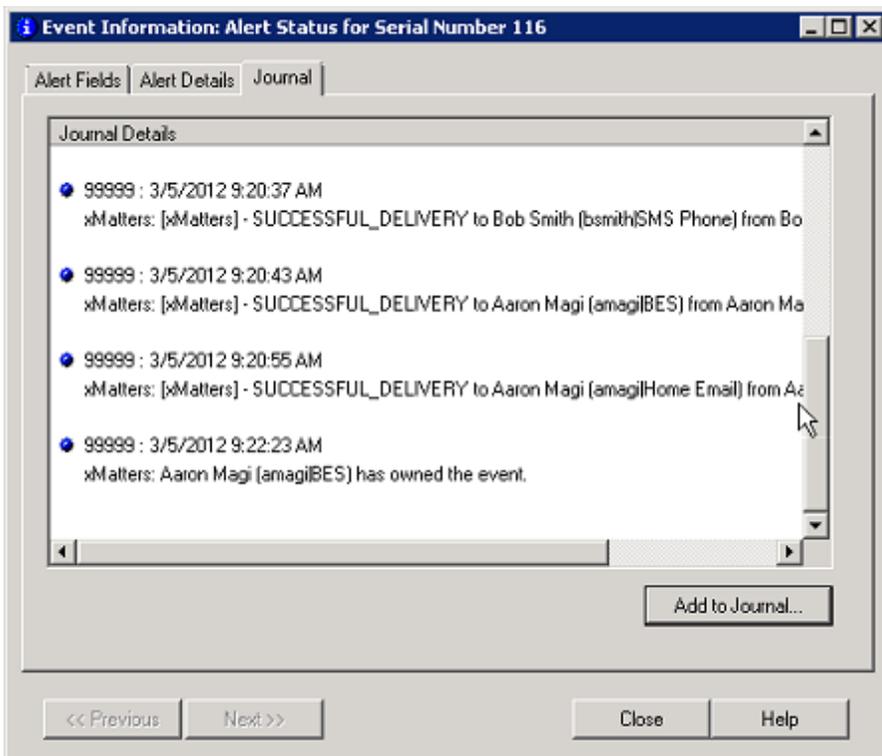
3.5 Testing Subscriptions

To test Subscriptions, ensure that you have created a Subscription (for more information, see "Creating a Subscription" on page 19). Trigger a notification that matches the criteria of the Subscription you created.

You will receive an FYI Notification (informational only) which will not have any response choices available if your Subscription Domain is configured to not add responses to notifications.

Chapter 4: Optimizing and Extending the Integration

This section describes some of the ways you can optimize or extend the xMatters (IT) engine for IBM Tivoli Netcool/OMNIbus integration.

4.1 Manually configuring xMatters

This integration includes an exported version of the xMatters script package and Event Domain, including Event Domain constants and predicates. If you do not want to use the included XML file to create and configure the required Event Domain and Action Scripts, the following sections describe how to manually configure these components.

4.1.1 Importing the script package

This integration includes a set of customized Action Scripts specific to Netcool/OMNIbus that must be imported into the xMatters scripts.

Note:	*This step requires the xMatters Developer IDE. For installation instructions and more information about scripting in xMatters, refer to the xMatters Online Developer's Guide.*

To import the xMatters Script Package:

1. Launch the IDE, and then configure the database connection.
2. Click **Workspace > Import**.
3. Select the `\components\xmatters\scripts\xM-IBM-Tivoli-Netcool.aps` file extracted from the integration zip file, click **Open**., and then click **OK**.
4. When the script has finished importing, click **OK**.
5. Right-click the **IBM Tivoli Netcool/OMNIbus (BUSINESS)** folder, and then select **Validate**.
6. Right-click the folder again, and then select **Check In**.
7. In the Create Script Package dialog box, click **Create**.
8. In the Check In dialog box, click **Close**.

4.1.2 Configuring the Event Domain

By default this integration is set up to use an Event Domain of "ibm_netcool"; it is strongly recommended that you use this Event Domain name. For the integration to be successful, the Event Domain name must match the value in the integration agent configuration file for the integration service (i.e., the <domain> tag in `ibmnetcool.xml`). Note that the <domain> tag MUST contain the same value in both XML files.

The xMatters relevance engine web server must be running to perform this portion of the integration.

To define an Event Domain:

1. Sign on to xMatters as a Company Administrator, and click the **Developer** tab.
2. In the Developer menu on the left side of the screen, click **Event Domains**.
3. On the Event Domains page, click **Add New**.
4. Enter the following information into the form:
   - **Name**: ibm_netcool
   - **Description**: Netcool/OMNIbus Integration
   - **Script Package**: IBM Tivoli Netcool/OMNIbus

5. Click **Save**.

Once you have defined the Event Domain, you can add the integration services, as described in "Defining the integration services" on page 14.

Defining Event Domain Constants

Company Administrators and Developers can create Event Domain Constants that will be available in scripting for all event objects associated with an Event Domain. This integration uses Event Domain Constants to define custom values for the integration script package.

The integration script package uses the names of the constants defined in the table below to look up the values; it is strongly recommended that you use the names specified, or speak to an xMatters client assistance representative before changing these values.

Note: *The values for the XMATTERS and BESPUSHURL constants should be modified to specify the address of the xMatters web server (to enable the HMTL response options) and the BES device server.*

To add an Event Domain Constant:

1. In xMatters, click the **Developer** tab, and then, in the menu on the left side of the screen, click **Event Domain Constants**.
2. In the **Event Domain** drop-down list, select **ibm_netcool**.
3. On the Event Domain Constants page, click **Add New**.
4. Define a **Constant Name**, **Value**, and **Description** for the new constant, according to the table below.
   - Note that Event Domain Constant names in xMatters version 5.0 MUST be defined in uppercase.
5. Click **Save**.
6. Repeat the above steps for each of the constants you want to add.
   - Note that if the constants are not defined in the web user interface, the scripts will use the values listed in the Default Values column of the following table.

Note: *Shaded rows indicate **mandatory** settings that are specific to your deployment. You must change the default settings to match your instance.*

Constant Name	Default Value	Description
XMATTERSURL	http://localhost:8888	Used to specify the address of the xMatters web server. The links provided in notification content use the XMATTERSURL constant value to locate the xMatters web server which would process the response. For these links to work, this address must be reachable from the Device where the User will receive the notification; normally, this is the IP address or fully-qualified host name of the xMatters web server. Populates the $main.xmatters_url variable.
BESPUSHURL	http://localhost:8888/static	Used to specify the address of the BES device server. Populates the $main.bes_pushurl parameter.

Constant Name	Default Value	Description
FORCEFYI	disable	Force notifications to be informational only (FYI), rather than requiring responses; this overrides the fyi behaviour specified on the injected event. Possible values: • **disable**: Nothing is forced. • **on**: Notifications are forced to be FYI. • **off**: Notifications are forced not to be FYI. Populates the `force_fyi` parameter.
FAILSAFEGROUP	Netcool Fail Safe	The fail-safe recipient to notify, typically a group. The fail-safe group identifies the recipient that will be notified if an event is injected to xMatters relevance engine and no subscriptions exist that match the event. Set this constant if you want to change the failsafe group from Netcool Fail Safe to another group defined in xMatters.
FAILSAFE	enabled	Controls fail-safe functionality, notifying the fail-safe recipient via EMAIL under certain circumstances; possible values are: • **enabled**: Notify if no subscriptions match or no notifiable recipients. • **for-subscriptions**: Notify if subscription functionality is enabled AND no subscriptions match. • **for-recipients**: Notify if no notifiable recipients. • **disabled**: Disable fail-safe functionality. Populates the `$fail_safe` parameter.
OVERRIDETIMEFRAMES	false	Override Recipients Device Timeframes. Populates the `$override_timeframes` parameter.
USEEMERGENCYDEVICES	false	Force the use of emergency Devices. Populates the `$use_emergency_devices` parameter.
TRACKDELIVERY	true	Track when each device is delivered to. Setting this to false may give a performance advantage, but you lose any information about whether a delivery was successful or not. Populates the `$track_delivery` parameter.
ANNOTATE	true	Enables submission of annotations back to the management system. Populates the `$main.annotate` parameter.

Constant Name	Default Value	Description
SUBSCRIPTIONANNOTATE	true	Enables submission of Subscription annotations back to the management system.
		Populates the $main.subscription_annotate parameter.
TRACKSUBSCRIPTIONDELIVERY	true	Track when each device is delivered to for Subscriptions.
		Populates the $track_subscriptionDelivery parameter.
TIMEOUT	259200	Amount of time (in seconds) the event is allowed to run before timing out. 259200 seconds = 72 hours.
		Populates the $main.timeout parameter.
MAXINVALIDRESPONSES	3	Specifies the maximum number of invalid responses allowed before notification is no longer requeued.
		Populates the $main.maxInvalidResponses parameter.
ENABLEHTMLEMAIL	true	Enables HTML email functionality.
		Populates the $main.enable_HTML_Email parameter.
USELOGO	true	Set this if you want the logo displayed within HTML email notifications.
		Populates the $main.use_logo parameter.
MAINLOGO	/static/images/logos /xmatters_email.gif	Indicates the location of the image that will be displayed in HTML notification., This is the default location for xMatters version 5.0. For 4.1 deployments, the image location should be changed to:
		/static/images/xmatters/logos/xmatters_email.gif
USEURLALIAS	false	Indicates how Response Choices are presented to xMatters to ensure that the user is authenticated in the correct company so the notification can be updated.; set to *true* for xMatters on demand integrations.
DEBUG	false	Indicates whether to use the debug level for logging messages.
		Populates the $main.debug variable.
ENABLESUBSCRIPTIONS	true	Indicates whether to enable processing of Subscriptions on incoming events.
SUBSCRIPTIONFYI	false	Indicates whether Subscriptions should be forced to be informational only (FYI).

Defining Event Domain predicates

The default Event Domain provided with the integration includes a number of predicates (also known as tokens or event parameters) that contain information about the incoming event. These predicates are created when you import the Event Domain, and assigned common values as defaults. You can modify or remove the default values to suit your deployment.

You can also use the following steps to add other predicates that you consider important and which you plan to add to the integration. For more information, see "Adding new parameters" on page 1. For more information about predicates, including the available types and how the Important flag works, refer to the *xMatters installation and administration guide*.

To define the Event Domain predicates:

1. In xMatters, click the **Developer** tab.
2. On the Event Domains page, click **ibm_netcool**.
3. On the Event Domain Details page, in the Predicates section, add to or modify the following predicates:

Event Domain predicates

Predicate	Type	Important	Description
Node	List		A list of managed entities from which alerts originate; may be host or device names, service names, or other entities.
			For IP network devices or hosts, Node is the resolved name of the device or host. In cases where the name cannot be resolved, Node is the IP address of the device or host.
Manager	List		A list of descriptive names for the probes that collect and forward the alerts to the ObjectServer; may also be used to indicate the host on which the probe is running.
AlertGroup	List	Yes	A list of descriptive names of the type of failure indicated by the alert; e.g., a disk partition indicated by a file system full alert or the switch port indicated by a utilization alert.
Severity	List		Indicates the alert severity level, which provides an indication of how the perceived capability of the managed object has been affected. The default values are: ● Clear ● Indeterminate ● Warning ● Minor ● Major ● Critical

4.1.3 Response choices

This integration allows recipients to respond to notifications with several default choices, some of which are injected back to the Netcool/OMNIbus server, updating the original alert. Users notified on email Devices also have the ability to respond with an extra annotation message which will be logged in the original alert, as described in "Adding annotation messages", below.

The following is a list of the default response choices (and their short forms) available with the integration, their availability based on the Device on which the notification is received, and their associated actions on the event in xMatters and the Netcool/OMNIbus alert.

Response	Netcool/OMNIbus Update	xMatters Job Control	Device Availability
Own (Own)	Updates the alert to mark the xMatters responder, updates the XMState to "XM_Owned", and records the response in the alert journal.	Delivered, delink all except responder	BES, email, voice, text.
Acknowledge (Ack)	Moves the alert to Acknowledged and updates the XMState to XM_Acknowledged., sets the Status to In Progress, and records the response in the alert journal.	Delivered, delink all	BES, email, voice, text.
Ignore (Ign)	No status change; records the response in the alert journal.	Delivered, notify next, delink responder.	BES, email, voice, text.
Annotate (Ann)	No status change; adds the annotation text to the alert journal.	Delivered	Email and two-way text Devices only.

Job control definitions

The xMatters job controls in the above table are defined as follows:

- **Delivered**: marks the notification as delivered.
- **Notify next**: notifies the next recipient in the Group according to the defined escalation in xMatters.
- **Delink responder**: marks the notification as delivered, and stops the responder from performing any further action on the notification.
- **Delink all except responder**: marks the notification as delivered, and stops any recipients other than the responder from performing any further action on the notification.
- **Delink all**: marks the notification as delivered, stops any further action on the notification for all recipients, and terminates the event in xMatters.

The job control defined for each response choice is the default configuration for this integration; for more information about job control, and how to modify these actions in the scripts, see the *xMatters Online Developer's Guide*.

4.2 Changing and adding response choices

Changing or adding a response choice to the integration requires the following steps:

- Modify the scripts that present the choices to the notification recipient
- Update the xMatters script to forward the response choice to the integration agent.
- Update the integration agent to send the response choice into Netcool/OMNIbus to perform the desired action on the originating alert.

As an example, the following steps illustrate how to add a response choice of "Be there in 10 minutes" to the integration.

Step One: Modifying the presented choices

To present the recipient with the new or modified response choices:

1. Launch the xMatters Developer IDE and open the INTERACTION > deviceResponses script.
2. Modify the parts of the script that add entries to the `$content.choices` variable.

Note that there is logic in the default implementation of this script to add options specific to email Devices and FYI notifications, and to display truncated response option text on limited Devices such as pagers.

Step Two: Forwarding the response to the integration agent

To forward the response choice to the integration agent, open the Handler script; make the following changes:

1. In the buildUserResponseMap script add:

```
@userResponseMap::put("be there in ten minutes", "be there in ten minutes")
```

2. In the processUserResponse script add:

```
IF ( $actionToken == "be there in ten minutes" )
GOSUB prepareAndSendServiceMessage

CALL sendAPDeliveredResponse
```

Step Three: Sending the response into Netcool/OMNIbus

To send the response choice from the integration agent into Netcool/OMNIbus, open the `ibmnetcool` file, and add a new case block to the switch statement in the handleResponse function:

```
switch (String(responseAction).toUpperCase())
  {
   case "acknowledge":
...
    break;
...
    case "be there in ten minutes":
      <your code goes here>
    break;
   default:
     throw("Unknown responseAction [" + responseAction + "]");
    break;
  }
```

The above is intended only as a brief overview of the required components. For more information about responses and scripting, refer to the xMatters Action Scripts and the xMatters Online Developer's Guide.

Adding annotation messages

Two-way email Device notifications (not FYI) can add extra annotations that will be added as a message on the alert in Netcool/OMNIbus. To add an extra annotation, respond to an email notification with the following format in the subject line:

```
RESPONSE <Choice> <Message>
```

`<Choice>` can be any of the response choices listed in the table above, and `<Message>` can be any content you want to add as the annotation.

Responses for FYI notifications

FYI notifications do not have any response choices available, except for FYI notifications sent to voice Devices. Voice FYI notifications offer the following response choices so that Users can navigate between multiple notifications. (This navigation is not required on other Devices.)

Voice Device responses for FYI notifications

Response	Description
Delete	Removes the notification from the User's list. This option is most likely to be selected.

Response	Description
Save	Saves the notification and stops attempting to deliver it to the User's other Devices. Users may select this option to delay listening to the notification when it is delivered, and access the details by calling in, or via the xMatters web user interface, at a later time.
Repeat	Replays the notification content.

4.2.1 Responses for sync errors

Sync Error notifications are based on the default "messaging" Event Domain. These create an event within xMatters and are FYI (i.e., no responses are available).

4.3 Annotations

This integration extensively annotates the originating Netcool/OMNIbus alert, but this may not be desirable in all environments. To prevent the annotation of an incident, change the "annotate" Event Domain Constant to *false*. For more information, see "Defining Event Domain Constants" on page 34.

4.4 Altering the duration of events

You can modify the amount of time xMatters will send out notifications for a particular event before it times out by changing the timeout Event Domain Constant. This constant stores the number of seconds the notifications will be allowed to continue before timing out.

For example, if you wanted to change the event duration to two hours, you could change the value for the timeout constant to **259200**.

For more information about working with Event Domain Constants, see "Defining Event Domain Constants" on page 34.

4.5 FYI Notifications

You can make all notifications informational only (i.e., the user is not offered any response choices) by setting the "forcefyi" Event Domain Constant to "on". This makes all normal and Subscription notifications one-way (FYI). For more information, see "Defining Event Domain Constants" on page 34.

Note: *All FYI events are set to priority LOW; this allows users to prevent the alerts from being sent to specific Devices by configuring their Devices to be used for only Medium and High priority alerts.*

4.5.1 Generating FYI notifications for Subscriptions

When using subscriptions to inform Users about service outages, you may want to remove responses from notifications generated for subscriptions.

To accomplish this, select the **One Way** check box on the Subscription Domain details page for the associated Subscription Domain.

4.6 Constructing BES and email notifications

You can configure xMatters to create BES and HTML email notifications.

This feature requires the xMatters Developer IDE. For installation instructions, refer to the xMatters Online Developer's Guide.

To enable BES and HTML email, the IBM Tivoli Netcool/OMNIbus (Business) script package set must be checked into the Developer IDE Database. If the script package has not been checked in already, see the instructions in "Importing the script package" on page 33.

Note:	*Some email clients, such as Microsoft Outlook 2007, may not display HTML elements correctly. It is recommended that you test the HTML compatibility of your email client before implementing the HTML email feature.*

To enable BES and/or HTML email:

1. In xMatters, click the Developer tab, and then, in the menu on the left side of the screen, click **Event Domain Constants**.
2. In the Event Domain drop-down list, select **ibm_netcool**.
3. On the Event Domain Constants page, do the following:
   - Set the **ENABLEHTML** constant to `true`.
   - Set the **USELOGO** constant to `true` (if you want your HTML email to show a logo).
   - Set the **XMATTERSURL** constant to the base URL of your xMatters web server. (default is localhost).
   - If you are using BES, set the **BESPUSHURL** constant to the URL of the BES server.

Note:	*If the Event Domain Constants are not present, you can add them using the names specified above. For more information, see "Defining Event Domain Constants" on page 34.*

4. Optionally, you can also use the Developer IDE to make any of the following changes to the Global Configuration Variables section of the initial PROCESS script in the IBM Tivoli Netcool/OMNIbus (Business) Production script package::
   - Change `$main.HTML_form_url` to point to a JSP page that you want to process any responses from the HTML email. (the default setting should work out-of-the-box).
   - Set `$main.logo_alt_text` to the text you wish to display when the logo cannot be fetched. This can be displayed if the email client is configured not to show images, or it could be displayed because the email client cannot access the xMatters web server directly and thus cannot respond by using the links in the HTML.
5. Save and validate the script, and check in the script package.

For more information about these and other configuration variables, see "Configuration Variable Reference" on page 55.

4.7 Uninstalling

For instructions on removing an xMatters deployment, refer to the *xMatters installation and administration guide*.

To remove the Netcool/OMNIbus objects installed as part of this integration:

Chapter 5: Configuration Variable Reference

This section outlines and describes the configuration variables available in the initial PROCESS Action Script.

Note that many of the configuration variables are configurable using the Event Domain Constants, as described in "Defining Event Domain Constants" on page 34; those variables are not listed here.

5.1 Global configuration variables

These variables are available throughout the script package, and are parameters of the "main" object. The value assigned to each variable is its default value within the script.

Gobal variables

Variable	Description
$main.use_logFile = false	Specify whether to use an alternate log file for debugging messages. This variable is ignored unless $main.debug is also set to true.
$main.logFile = "../logs/"	Defines the file used to log debugging information (only if $main.use_logfile is set to true).
$main.HTML_form_url = $AlarmPoint_URL & "/jsp/ProcessNotificationResponse.jsp"	Specifies the URL of the xMatters web server's Process Notification Response JSP form, used by HTML email and BES to inject responses through the system.
$main.logo = $AlarmPoint_URL & "/static/images/logos/alarmpoint/UNKNOWN.png"	Specifies the path to the graphic displayed on HTML (email and BES) notifications.
$main.logo_alt_text = "[If the logo does not appear you may be blocking images or you may be outside a firewall. If the latter, the links will not work for responding and you should respond by replying to this email as described below.]"	The alternate text to display if the HTML email logo is unavailable. **Note**: If the logo does not display, it is unlikely that the HTML_form_url is valid and responses will not be injected from HTML Devices (email and BES).
$main.numeric_pager_number = "555-1212"	The phone number to display for calling in to retrieve event information. This variable has a non-existent number as a default value; a real call-in number must be supplied, or a message indicating that an xMatters event has occurred.

5.2 Local Configuration Variable

These variables are available only in this script, and control how the script runs. For more information about the initial PROCESS script, consult the *xMatters Online Developer's Guide*.

5.2.1 FYI and Subscription Notification Variables

The following variables configure the behavior of informational-only, or FYI, notifications. The value assigned to each variable is the default value within the script.

Note: *For more information on the behavior associated with informational-only notifications, see "FYI Notifications" on page 40.*

<div align="center">FYI and Subscription variables</div>

Variable	Description
$use_email_for_fyi = true	Configure Device filters for informational-only (FYI) notifications.
$use_phone_for_fyi = false	Setting these flags to false prevents that Device type from being notified with informational (FYI) messages.
$use_im_for_fyi = true	
$use_text_phone_for_fyi = true	
$use_text_pager_for_fyi = true	
$use_numeric_pager_for_fyi = true	
$use_bes_for_fyi = true	
$use_generic_for_fyi = true	

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1-877-xMattrs

12647 Alcosta Blvd., #425
San Ramon, CA 94583 USA
+ 1.925.251.5733

Central Court 25 Southampton Buildings,
London WC2A 1AL UK
+ 44.0.20.3427.6326