

**Oracle® Communications  
Performance Intelligence Center**

Diagnostic Utility Administration Guide

Release 9.0

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## Chapter1: About this Help Text

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- *Scope and Audience*
- *About the Performance Intelligence Center*
- *Customer Care Center*
- *PIC Documentation Library*
- *Locate Product Documentation on the Customer Support Site*

## Scope and Audience

This guide is designed to assist the user in working with Diagnostic Utility and surveillance concepts and procedures. It is designed for users with the role System Administrator, NSPMonitorManager or NSPMonitorPowerUser working with the PIC system to view either the overall status of sites, subsystems or servers.

## About the Performance Intelligence Center

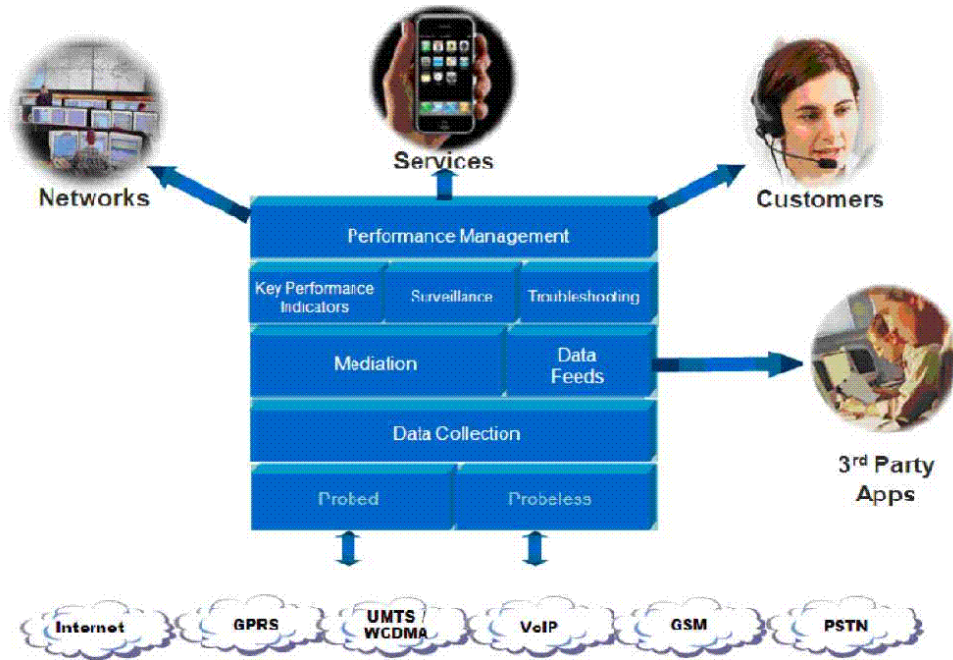
The Performance Intelligence Center (PIC) is a monitoring and data gathering system that provides network performance, service quality and customer experience - across various networks, technologies, protocols, etc. Beyond monitoring performance and gathering data, the solution also provides analytics, actionable intelligence and potentially an intelligent feedback mechanism. It allows Service Providers to simultaneously look across the Data Link, Network, Transport and Application layer traffic to better correlate and identify the impact of network problems on revenue generating applications and services.

PIC functionality is based on the following general flow. The Integrated Message Feeder (IMF) is used to capture SS7 and SigTran traffic. The Probed Message Feeder (PMF) is used to capture both SS7 and IP traffic. Both products forward Probe Data Units (PDUs) to the Integrated xDR Platform (IXP). The IXP stores this traffic data and correlates the data into detailed records (CDRs, IPDRs, TDRs, etc.). The IXP then stores the data on the system for future analysis. The Network Software Platform (NSP) provides applications that mine the detailed records to provide value-added services such as network performance analysis, call tracing and reporting.

PIC centralized configuration tasks fall into one of two categories:

- Data Acquisition and Processing - the configuration of the probes, routing of PDUs to the xDR builder setup, KPI generation, data feeds, etc.
- PIC System Administration - the configuration of monitoring sites, configuring PIC servers, setting up permissions, etc.

**Note:** For more information see Centralized Configuration Manager Administration Guide. This is a graphic overview of the PIC system.



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Figure 1 : PIC Overview

## User Preferences

All applications that query xDRs use a specific User Preferences option. The description outlined goes over the formatting screens.

**Note:** All screen shots presented here show default values.

### Date/Time Tab Screen

Format the time parameters.

The screenshot shows the 'Preferences' window with the 'Date/Time' tab selected. The window title is 'User preferences'. The tabs are: Date/Time, Directory, Mapping, Point Code, CIC, and Default Period. The 'Date/Time' tab contains the following fields:

- Date format:** dd/MM/yyyy \*
- Time format:** HH:mm:ss \*
- Date and time fields:** dd/MM/yyyy HH:mm:ss \*
- Duration fields:** hhh:mm:ss.ms
- Time zone:** (GMT -08:00) America/Los\_Angeles

Below the fields, there is a 'Tips' section:

*Tips: above fields represents the format that will be applied to different types of fields. Here is an help about authorized values and their meanings. Separators are allowed, and will be restituted "as is". Please note that these formats are case sensitive.*

Legend:

- yy or yyyy: Year (number)
- dd: Day in month (number)
- EEE: Day in week (string)
- MM or MONTH: Month in year (respectively number or string)
- aa: AM/PM marker (string)
- HH: Hour in day (0-23)
- hh: Hour in AM/PM (1-12)
- mm: Minute in hour (number)
- ss: Second in minute (number)

At the bottom, there are four buttons: Reset, Reset Tab, Apply, and Cancel.

Figure 2: Date/Time Tab Screen

Field	Description
Date Format	Required field - Sets date format.
Time Format	Required field - Sets time format.
Date and time fields	Required field - Sets the date and time format.
Duration fields	Sets a duration format
Time Zone	Pull-down list for selecting the desired time zone
Reset Button	Resets all the tabs to default values
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system.
Cancel Button	Exits the screen

**Table 1 : Time Tab**

### **Directory Tab**

Select the **Directory tab** to set the defaults directories used in transport screen.

The screenshot shows a 'Preferences' window with a 'User preferences' section. The 'Directory' tab is selected, showing three text input fields: 'Export Directory', 'Upload Directory', and 'Download Directory', each containing '/tmp'. A warning message is displayed below the fields. At the bottom, there are four buttons: 'Reset', 'Reset Tab', 'Apply', and 'Cancel'.

**Figure 3: Directory Tab Screen**

Field	Description
Export Directory	Enables you to set the default directory for exporting.
Upload Directory	Enables you to set the default directory for uploads
Download Directory	Enables you to set the default directory for downloads
Reset Button	Resets all the tabs to default values
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system.
Cancel Button	Exits the screen.

**Table 2: Directory Tab**

**Note:** The directories must be present on the NSP server side. See Warning at the bottom of Directory tab screen.

### Mapping tab

Select the Mapping tab to set the xDR display parameters.

The screenshot shows the 'Preferences' window with the 'Mapping' tab selected. The 'XDR display' section is active, showing three checked options: 'Translate ENUM values', 'Point Code to Node Name', and 'Link Short Name to Long Name'. The 'Reset' and 'Reset Tab' buttons are visible at the bottom left, and 'Apply' and 'Cancel' buttons are at the bottom right.

**Figure 3: Mapping Tab Screen**

Field	Description
Translate ENUM values	Selects whether ENUM values are translated or not Default is to select ENUM values translation.
Point Code to Node Name	Select this if you want to use the Node Name instead of the Point Code name in the xDR display. Default is to use Node Name.
Link Short Name to Long Name	Selects whether you can use long name (Eagle) for link sets .Default to use Long Name
Reset Button	Resets all the tabs to default values.
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system.
Cancel Button	Exits the screen.

**Table 3 : Mapping Tab**

### Point Code tab

Select the Point Code tab, shown and described in the figure and table.

**Preferences**

**User preferences**

Date/Time   Directory   Mapping   **Point Code**   CIC   Default Period

Point code

Hexadecimal display ☒

Decimal display ☐

Split format ☒

Bit groups

Separation

Group 0  \*

Group 1  \*

Group 2  \*

Group 3  \*

Reset   Reset Tab   Apply   Cancel

**Figure 4: Point Code Tab**

**Note:** if Session Point Code feature is enabled the Point Code tab will look like

**Preferences**

**User preferences**

Date/Time   Directory   Mapping   **Point Code**   CIC   Default Period

**DEFAULT**   ANSI   ETSI\_I   ETSI\_N   CHINESE   JAPANESE

Point code

Hexadecimal display ☐

Decimal display ☒

Split format ☒

Bit groups

Separation

Group 0  \*

Group 1  \*

Group 2  \*

Group 3  \*

Reset   Reset Tab   Apply   Cancel

**Figure 5: Point Code Tab with Session Point Code Enabled**

Field	Description
Hexadecimal display	European defaults are hexadecimal and display with Group 0-3, Group 1-8, Group 2-3, Group 3-0.
Decimal display	North American defaults are decimal and display with Group 0-7 and Group 1-5.
Split format	Select or deselect Split format.
Separation	Select a Bit Group Separation
Group 0	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Group 1	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Group 2	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Group 3	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Reset Button	Resets all the tabs to default values.
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system
Cancel Button	Exits the screen.

**Table 4: Point code Tab**

### **CIC tab**

Select the **CIC** tab to set the parameters for CIC and Bit groups.



**Figure 6: Formatting Rules (CIC) Screen**

Field	Description
Hexadecimal display	European defaults are hexadecimal and display with Group 0-3, Group 1-8, Group 2-3, Group 3-0.
Decimal display	North American defaults are decimal and display with Group 0-7 and Group 1-5.
Split format	Select or deselect Spilt format.
Separation	Select a Bit Group Separation Group 0:8, Group 1:8.
Group 0	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Group 1	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Reset Button	Resets all the tabs to default values.
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system
Cancel Button	Exits the screen.

**Table 5 : CIC Tab**

## Default Period tab

Select the **Default Period tab**, for setting the default time period for beginning and ending time for traces (ProTrace only).

The screenshot shows a 'Preferences' window with a 'User preferences' section. There are six tabs: 'Date/Time', 'Directory', 'Mapping', 'Point Code', 'CIC', and 'Default Period'. The 'Default Period' tab is selected. Below the tabs, there is a label 'Default Period:' followed by a text input field containing the number '24' and the unit 'hours'. At the bottom of the window, there are four buttons: 'Reset', 'Reset Tab', 'Apply', and 'Cancel'.

**Figure 7: Default Period Tab Screen (ProTrace only)**

Field	Description
Default Period (in hours)	Sets the default run time period for running traces. Default is 24 hours. Range 1-7200
Reset Button	Resets all the tabs to default values.
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system.
Cancel Button	Exits the screen.

**Table 6: Default Period Tab Field Descriptions**

After setting the formatting parameters, click **Next** to move to the next screen in the wizard.

## Customer Care Center

The Tekelec Customer Care Center is your initial point of contact for all product support needs. A representative takes your call or email, creates a Customer Service Request (CSR) and directs your requests to the Tekelec Technical Assistance Center (TAC). Each CSR includes an individual tracking number. Together with TAC Engineers, the representative will help you resolve your request.

The Customer Care Center is available 24 hours a day, 7 days a week, 365 days a year, and is linked to TAC Engineers around the globe.

Tekelec TAC Engineers are available to provide solutions to your technical questions and issues 7 days a week, 24 hours a day. After a CSR is issued, the TAC Engineer determines the classification of the trouble. If a critical problem exists, emergency procedures are initiated. If the problem is not critical, normal support procedures apply. A primary Technical Engineer is assigned to work on the CSR and provide a solution to the problem. The CSR is closed when the problem is resolved.

Tekelec Technical Assistance Centers are located around the globe in the following locations:

Tekelec - Global

Email (All Regions): [support@tekelec.com](mailto:support@tekelec.com)

- **USA and Canada**

Phone:

1-888-FOR-TKLC or 1-888-367-8552 (toll-free, within continental USA and Canada)

1-919-460-2150 (outside continental USA and

Canada)

TAC Regional Support Office Hours:

8:00 a.m. through 5:00 p.m. (GMT minus 5 hours), Monday through Friday, excluding holidays

- **Caribbean and Latin America (CALA)**

Phone:

USA access code +1-800-658-5454, then 1-888-FOR-TKLC or 1-888-367-8552

(toll-free)

TAC Regional Support Office Hours (except Brazil):

10:00 a.m. through 7:00 p.m. (GMT minus 6 hours), Monday through Friday, excluding holidays

- **Argentina**

Phone:

0-800-555-5246 (toll-free)

- **Brazil**

Phone:

0-800-891-4341 (toll-free)

TAC Regional Support Office Hours:

8:30 a.m. through 6:30 p.m. (GMT minus 3 hours), Monday through Friday, excluding holidays

- **Chile**

Phone:

1230-020-555-5468

➤ **Colombia**

Phone:

01-800-912-0537

➤ **Dominican Republic**

Phone:

1-888-367-8552

➤ **Mexico**

Phone:

001-888-367-8552

➤ **Peru**

Phone:

0800-53-087

➤ **Puerto Rico**

Phone:

1-888-367-8552 (1-888-FOR-TKLC)

➤ **Venezuela**

Phone:

0800-176-6497

● **Europe, Middle East, and Africa**

Regional Office Hours:

8:30 a.m. through 5:00 p.m. (GMT), Monday through Friday, excluding holidays

➤ **Signaling**

Phone:

+44 1784 467 804 (within UK)

➤ **Software Solutions**

Phone:

+33 3 89 33 54 00

● **Asia**

➤ **India**

Phone:

+91 124 436 8552 or +91 124 436 8553

TAC Regional Support Office Hours:

10:00 a.m. through 7:00 p.m. (GMT plus 5 1/2 hours), Monday through Saturday, excluding holidays

➤ **Singapore**

Phone:

+65 6796 2288

TAC Regional Support Office Hours:

9:00 a.m. through 6:00 p.m. (GMT plus 8 hours), Monday through Friday, excluding holidays

## **PIC Documentation Library**

PIC customer documentation and online help are created whenever significant changes are made that affect system operation or configuration. Revised editions of the documentation and online help are distributed and installed on the customer system. Consult your NSP Installation Manual for details on how to update user documentation. Additionally, a Release Notice is distributed on the Tekelec Customer Support site along with each new release of software. A Release Notice lists the PRs that have been resolved in the current release and the PRs that are known to exist in the current release. Listed is the entire PIC documentation library of user guides.

- Security User Guide
- Alarms User Guide
- ProAlarm Viewer User Guide
- ProAlarm Configuration User Guide
- Centralized Configuration Manager Administration Guide
- Customer Care User Guide
- Alarm Forwarding Administration Guide
- Diagnostic Utility Administration Guide
- ProTraq User Guide
- ProPerf User Guide
- ProPerf Configuration User Guide
- System Alarms User Guide
- ProTrace User Guide
- Data Feed Export User Guide
- Audit Viewer Administration Guide
- ProDiag User Guide
- SigTran ProDiag User Guide
- Report Server Platform User Guide
- Reference Data User Guide
- Exported Files User Guide
- Scheduler User Guide
- Quick Start User Guide

## Locate Product Documentation on the Customer Support Site

Access to Tekelec's Customer Support site is restricted to current Tekelec customers only. This section describes how to log into the Tekelec Customer Support site and locate a document. Viewing the document requires Adobe Acrobat Reader, which can be downloaded at [www.adobe.com](http://www.adobe.com).

1. Log into the [https://secure.tekelec.com/OA\\_HTML/ibuhpage.jsp](https://secure.tekelec.com/OA_HTML/ibuhpage.jsp) site.  
**Note:** If you have not registered for this new site, click the Register Here link. Have your customer number available. The response time for registration requests is 24 to 48 hours.
2. Click the Product Support tab.
3. Use the Search field to locate a document by its part number, release number, document name, or document type. The Search field accepts both full and partial entries.
4. Click a subject folder to browse through a list of related files.
5. To download a file to your location, right-click the file name and select **Save Target As**.

## Chapter2: Introduction to Diagnostic utility

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*About Diagnostic Utility*

*Opening Diagnostic Utility*

*Understanding the Diagnostic Utility Screen*

*About Diagnostic Utility Perspectives*

*About sites Perspective*

*About servers Perspective*

## About Diagnostic Utility

The Diagnostic Utility application is used by users with the role NSP Administrator, NSPMonitorPowerUser or NSPMonitorManager for monitoring PIC sites, subsystems (IXP and xMF) and servers including specific hardware components such as disk storage and network cards.

Diagnostic Utility is dependent on the IXP, IMF or PMF subsystems.

As stated above, Diagnostic Utility supports monitoring of xMF (IMF / PMF), IXP subsystems as well as their hardware components. Listed here are the parameters for each subsystem or server that is monitored.

For xMF

- Status of servers and subsystems
- Destinations
- Card interfaces (PMF only)

For IXP

- Status of servers and subsystems
- Streams
- Sessions
- Data Flow processings
- Store
- Hardware Counters

For server hardware components

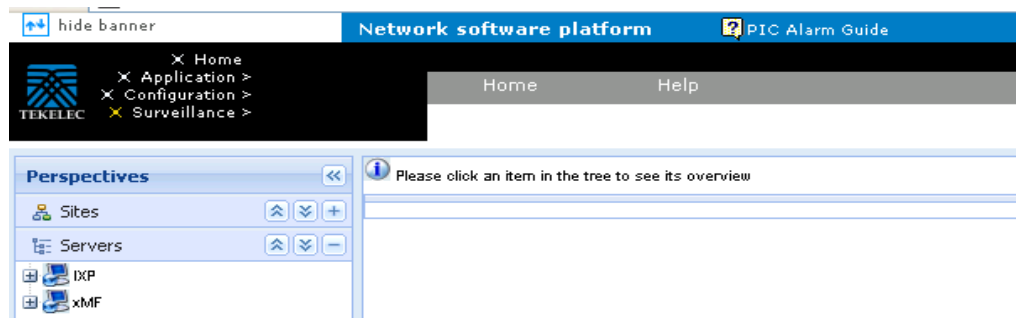
- Server parameters
- Ethernet parameters
- Disk parameters

## Opening Diagnostic Utility

**Note:** NSP only supports versions of IE 7.0 or later and Firefox 3.6 or later. Before using NSP, turn off the browser pop up blocker for the NSP site.



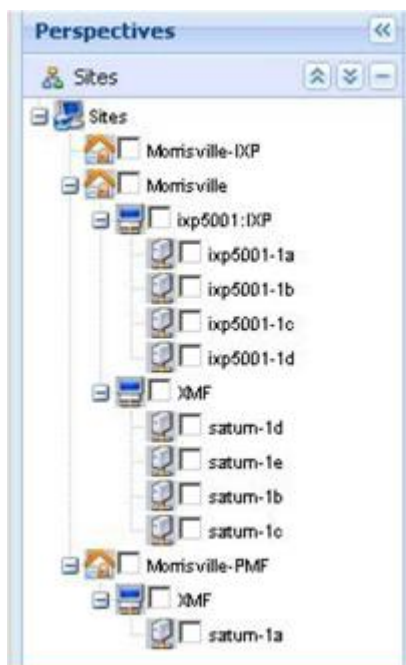
After you have logged into NSP you can open Diagnostic Utility by clicking on the *Diagnostic Utility* icon from Surveillance section of NSP Application Board



**Figure 8: Diagnostic Utility home screen**

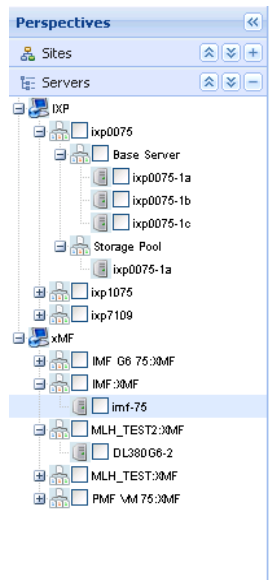
The screen is divided into two main sections:

- Object Tree - located on the left-hand panel shows the three main perspectives and enables you to navigate through the data (drill down). The two perspectives are:
  - Sites - this perspective shows you how the subsystems/servers are physically organized. This perspective is referenced from the system you have configured. You can select subsystems/servers you want to monitor. The figure below shows an example of an expanded Sites perspective.



**Figure 9: Sites Object Tree Expanded**

- Servers - this perspective shows all subsystems/servers grouped by type (for example xMF or IXP). This perspective is used to select the subsystem or server you want monitor. The figure below shows the servers perspective



**Figure 10: Server Object Tree Expanded**

- Workspace - located on the right-hand section provides a table that enables you to list, sort and view counters. The figure shows a workspace area (of a single server).

Refresh Rate: 30 s

Last refresh: 07:15:22

Completed

xMF > IMF:0MF > imf-75

Server description

Server

imf-75

Location

1A

Role

ActMaster

Monitoring Group

MG\_NEW

Assignment

16

User Information

Server Counts

Failover

Heart Beat Time

CPU Usage (%)

In Throughput (K)

Out Throughput (K)

PDU In Speed (K)

PDU Out Speed (K)

Inet Sync

Inet Merge

Last Update Time

IS

04/19/2012 16:43:42

14

0

0

0

0

DownReject

DownReject








04/19/2012 16:43:33

**Figure 11: Workspace Tree Expanded**

## Collapse / Expand Buttons

The Diagnostic Utility application has a collapse / expands screen function shown in the figures below.

**Note:** You can also open each perspective by clicking on the perspective header.

-  *Close perspective panel* - clicking this button located on the perspective header collapses the panel to the left creating more room in the work space panel.
-  *Open perspective panel* - clicking this button on the perspective header opens the panel to the right showing the perspective panel
-  *Expand all* - clicking on this button expands the object tree.
-  *Collapse all* - clicking on this button collapses the object tree.
-  *Expand perspective object tree* - clicking on this button opens the perspective.
-  *Collapse perspective object tree* - clicking on this button collapses the perspective.
-  *Charting* - clicking on this button in an overview table opens the count selection menu of the charting function.

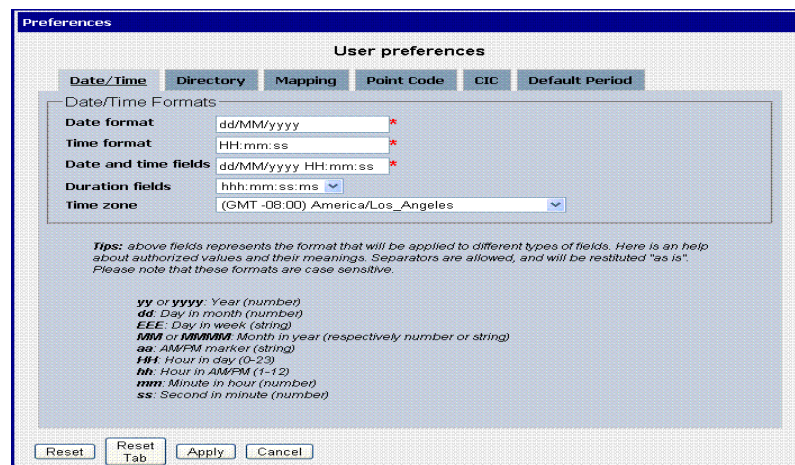
## User Preferences

All applications that query xDRs use a specific User Preferences option. The description outlined goes over the formatting screens.

**Note:** All screen shots presented here show default values.

### Date/Time Tab Screen

Format the time parameters.



The image shows a 'User preferences' dialog box with the 'Date/Time' tab selected. The dialog has several tabs: Date/Time, Directory, Mapping, Point Code, CIC, and Default Period. Under 'Date/Time Formats', there are five fields: 'Date format' (dd/MM/yyyy), 'Time format' (HH:mm:ss), 'Date and time fields' (dd/MM/yyyy HH:mm:ss), 'Duration fields' (hhh:mm:ss.ms), and 'Time zone' ((GMT -08:00) America/Los\_Angeles). Each field has a red asterisk to its right. Below the fields is a 'Tips' section explaining the format codes: yy or yyyy for Year, dd for Day in month, EEE for Day in week, MM or MMMMM for Month, aa for AM/PM marker, HH for Hour in day, hh for Hour in AM/PM, mm for Minute in hour, and ss for Second in minute. At the bottom are buttons for 'Reset', 'Reset Tab', 'Apply', and 'Cancel'.

**Preferences**

**User preferences**

**Date/Time** **Directory** **Mapping** **Point Code** **CIC** **Default Period**

Date/Time Formats

**Date format** dd/MM/yyyy \*

**Time format** HH:mm:ss \*

**Date and time fields** dd/MM/yyyy HH:mm:ss \*

**Duration fields** hhh:mm:ss.ms

**Time zone** ((GMT -08:00) America/Los\_Angeles)

*Tips: above fields represents the format that will be applied to different types of fields. Here is an help about authorized values and their meanings. Separators are allowed, and will be restituted "as is". Please note that these formats are case sensitive.*

yy or yyyy: Year (number)  
 dd: Day in month (number)  
 EEE: Day in week (string)  
 MM or MMMMM: Month in year (respectively number or string)  
 aa: AM/PM marker (string)  
 HH: Hour in day (0-23)  
 hh: Hour in AM/PM (1-12)  
 mm: Minute in hour (number)  
 ss: Second in minute (number)

Reset Reset Tab Apply Cancel

**Figure 12: Date/Time Tab Screen**

Field	Description
Date Format	Required field - Sets date format.
Time Format	Required field - Sets time format.
Date and time fields	Required field - Sets the date and time format.
Duration fields	Sets a duration format
Time Zone	Pull-down list for selecting the desired time zone
Reset Button	Resets all the tabs to default values
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system.
Cancel Button	Exits the screen

**Table 7: Time Tab**

### Directory Tab

Select the Directory tab to set the defaults directories used in transport screen.

The screenshot displays the 'User preferences' window with the 'Directory' tab selected. Under the 'Directories' section, there are three text input fields: 'Export Directory', 'Upload Directory', and 'Download Directory', each containing the value '/tmp'. A red asterisk is visible to the right of each field. Below these fields, a warning message reads: 'Warning: above directories must exist on server side. No check is done by application. It is user responsibility to do so.' At the bottom of the window, there are four buttons: 'Reset', 'Reset Tab', 'Apply', and 'Cancel'.

**Figure 13: Directory Tab Screen**

Field	Description
Export Directory	Enables you to set the default directory for exporting.
Upload Directory	Enables you to set the default directory for uploads
Download Directory	Enables you to set the default directory for downloads
Reset Button	Resets all the tabs to default values
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system.
Cancel Button	Exits the screen.

**Table 8: Directory Tab**

**Note:** The directories must be present on the NSP server side. See Warning at the bottom of Directory tab screen.

## Mapping tab

Select the Mapping tab to set the xDR display parameters.

The screenshot shows the 'Preferences' dialog box with the 'Mapping' tab selected. The 'User preferences' section contains several tabs: 'Date/Time', 'Directory', 'Mapping' (selected), 'Point Code', 'CIC', and 'Default Period'. Under the 'Mapping' tab, there is a section titled 'XDR display' with three checked options: 'Translate ENUM values', 'Point Code to Node Name', and 'Link Short Name to Long Name'. At the bottom of the dialog, there are four buttons: 'Reset', 'Reset Tab', 'Apply', and 'Cancel'.

**Figure 14: Mapping Tab Screen**

Field	Description
Translate ENUM values	Selects whether ENUM values are translated or not Default is to select ENUM values translation.
Point Code to Node Name	Select this if you want to use the Node Name instead of the Point Code name in the xDR display. Default is to use Node Name.
Link Short Name to Long Name	Selects whether you can use long name (Eagle) for link sets .Default to use Long Name
Reset Button	Resets all the tabs to default values.
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system.
Cancel Button	Exits the screen.

**Table 9 : Mapping Tab**

Point Code tab

Select the Point Code tab, shown and described in the figure and table.

The 'Preferences' dialog box is shown with the 'User preferences' section. The 'Point Code' tab is selected. Under 'Point code', 'Hexadecimal display' is selected with a radio button, 'Decimal display' is unselected, and 'Split format' is checked with a checkbox. Under 'Bit groups', the 'Separation' dropdown is set to 'minus [-]'. There are four input fields for 'Group 0', 'Group 1', 'Group 2', and 'Group 3' with values 8, 8, 8, and 0 respectively. Each input field has a red asterisk to its right. At the bottom are buttons for 'Reset', 'Reset Tab', 'Apply', and 'Cancel'.

Figure 15: Point Code Tab

**Note:** if Session Point Code feature is enabled the Point Code tab will look like

The 'Preferences' dialog box is shown with the 'User preferences' section. The 'Point Code' tab is selected. Above the 'Point code' section, there are tabs for 'DEFAULT', 'ANSI', 'ETSI\_I', 'ETSI\_N', 'CHINESE', and 'JAPANESE'. The 'Point code' section shows 'Hexadecimal display' unselected, 'Decimal display' selected, and 'Split format' checked. The 'Bit groups' section is the same as in Figure 15, with 'Separation' set to 'minus [-]' and input fields for Groups 0-3 with values 3, 8, 3, and 0. At the bottom are buttons for 'Reset', 'Reset Tab', 'Apply', and 'Cancel'.

Figure 16: Point Code Tab with Session Point Code Enabled

Field	Description
Hexadecimal display	European defaults are hexadecimal and display with Group 0-3, Group 1-8, Group 2-3, Group 3-0.
Decimal display	North American defaults are decimal and display with Group 0-7 and Group 1-5.
Split format	Select or deselect Split format.
Separation	Select a Bit Group Separation
Group 0	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Group 1	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Group 2	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Group 3	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Reset Button	Resets all the tabs to default values.
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system
Cancel Button	Exits the screen.

**Table 10: Point code Tab****CIC tab**

Select the **CIC** tab to set the parameters for CIC and Bit groups.



**Preferences**

**User preferences**

**Date/Time** **Directory** **Mapping** **Point Code** **CIC** **Default Period**

CIC

Hexadecimal display ☒

Decimal display ☐

Split format ☒

Bit groups

Separation minus [-] ▼

Group 0 7 \*

Group 1 5 \*

Reset Reset Tab Apply Cancel

**Figure 17: Formatting Rules (CIC) Screen**  
**Table 11: CIC Tab**

Field	Description
Hexadecimal display	European defaults are hexadecimal and display with Group 0-3, Group 1-8, Group 2-3, Group 3-0.
Decimal display	North American defaults are decimal and display with Group 0-7 and Group 1-5.
Split format	Select or deselect Spilt format.
Separation	Select a Bit Group Separation Group 0:8, Group 1:8.
Group 0	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Group 1	Type a value. (0-7 or 1-5 see hexadecimal or decimal display)
Reset Button	Resets all the tabs to default values.
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system
Cancel Button	Exits the screen.

## Default Period tab

Select the **Default Period tab**, for setting the default time period for beginning and ending time for traces (ProTrace only).

**Figure 18: Default Period Tab Screen (ProTrace only)**

Field	Description
Default Period (in hours)	Sets the default run time period for running traces. Default is 24 hours. Range 1-7200
Reset Button	Resets all the tabs to default values.
Reset Tab Button	Resets to default values for the specific tab.
Apply Button	Applies any changes to the system.
Cancel Button	Exits the screen.

**Table 12: Default Period Tab Field Descriptions**

After setting the formatting parameters, click **Next** to move to the next screen in the wizard.

## Understanding the Diagnostic Utility Screen

This section provides a brief overview of the screen unique to *Diagnostic Utility*. For more detailed information on common NSP screen elements such as the toolbar and function buttons, see *NSP Platform Guide*

## Main Screen Functions

This section discusses the main functions on the *Diagnostic Utility* screen. Each configuration parameter is discussed in its own section. The main screen functions are:

- Screen Menu Bar - shows pull-down menus for Home and Help.

Home menu has the following options:

- Home screen - selecting this menu item brings you back to the *Home* screen.
- Preferences - selecting this menu item opens the *Preferences* screen where you can configure *Diagnostic Utility*. For more information on using *Preferences*, see "*Configuring Diagnostic Utility*."

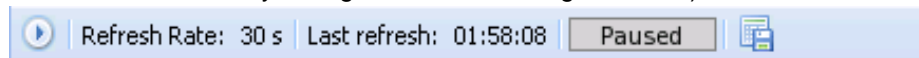
Help menu has the following options:

- User Manual - opens the online help for *Diagnostic Utility*
  - About - provides information on the Release, Package version, Branch and Revision
- Object tree - selecting one of the elements on the left-hand section opens the appropriate screen.
    - Object tree panel buttons - selecting one of these buttons opens, closes, expands or collapses the panel or perspective
    - Object selection field - this field is for multiple site, subsystem, server viewing. To use this field, you *can only* select the same level (site, subsystem, server) to view using the multiple-view function
    - Pop-Up menu - right clicking on an object icon opens a menu. The menu changes according to the object's properties

- Toolbar - the functions are described here

**Note:** The toolbar can be viewed only when an object is selected.

- Pause - pauses the monitoring process (and the screen no longer is refreshed to show any changes shown in the figure below)



**Figure 19: Sample Screen Toolbar - In Paused**

### State

- Continue - begins the monitoring process again and the screen refresh process begins again shown below

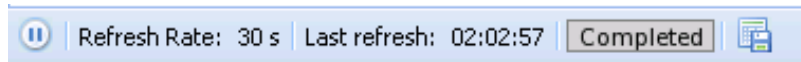


Figure 20: Sample Screen Toolbar - In Monitoring

### State

- Screen Refresh rate - shows currently selected time interval
  - For screen overview (for both IXP and xMF) intervals are: 30 seconds (default value), 1 , 5 and 10 minutes
- Last Refresh - shows the time (either in 12 or 24 hour format in your local time) when the last screen refresh was accomplished
- Save As - saves the information as a csv zip file, for the table (counters) being monitored, for exporting zipped files in csv format. For more information, see *Exporting Overview Tables in CSV Format*.

**Note:** You can select the time intervals in the *Preferences* operation.

**Note:** See User Preferences in *NSP Platform Guide* for details on setting time format.

**Note:** Do not use the Function Keys (F1 through F12) when using the NSP. Function keys work in unexpected ways. For example, the F1 key will not open NSP help but will open help for the browser in use. The F5 key will not refresh a specific screen, but will refresh the entire session and will result in a loss of any entered information.

## Column functions on Tables

Each column in *Diagnostic Utility* has a pull-down menu that provides a number of options.

**Note:** Column headings for each table are discussed in the separate sections. Complete these steps to show the options.

1. Place the cursor on a **particular column** and the pull-down arrow appears.
2. Click on the **pull-down arrow**.

The sort/column menu opens shown in figure below



Figure 21: Sort/Column Menu

### Sort Option

The sort functions enable you to sort in *Ascending* or *Descending* order.

### Selecting Columns to View

You can select which table columns to view by using the *column pull-down* menu. Complete these steps to select table columns.

1. Select the parameter table you want to view. The table opens shown in the figure below.

Server	Type	Location	Heart Beat Time	CPU Usage (%)	Memory Free (K)	Last Update Time	Start Date and Time
ixp0075-1a	Primary	1A	04/20/2012 11:35:51	0.5	8640032	04/20/2012 11:35:46	N/A
ixp0075-1b	Secondary	1B	04/20/2012 11:35:32	0.2	15428428	04/20/2012 11:35:09	N/A
ixp0075-1c	Ancillary	1C	04/20/2012 11:35:32	0.2	1676140	04/20/2012 11:35:45	N/A

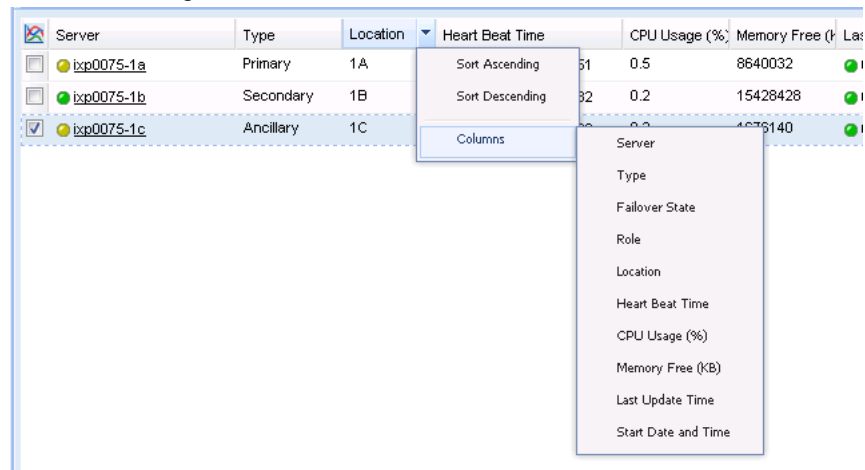
Figure 22: Selected Table

2. Select any column
3. Click the down arrow

Server	Type	Location	Heart Beat Time	CPU Usage (%)	Memory Free (K)	Last Update Time	Start Date and Time
ixp0075-1a	Primary	1A	04/20/2012 11:35:51	0.5	8640032	04/20/2012 11:35:46	N/A
ixp0075-1b	Secondary	1B	04/20/2012 11:35:32	0.2	15428428	04/20/2012 11:35:09	N/A
ixp0075-1c	Ancillary	1C	04/20/2012 11:35:32	0.2	1676140	04/20/2012 11:35:45	N/A

Figure 23: Selected Column with Pull down menu

4. Select Columns. The column selection list for that parameter opens shown in the figure below.



**Figure 24: Selected Column with pull down menu**

5. Select the **columns** you want to view.
  6. Click **anywhere** on the screen.
- The table changes to show only the selected columns shown below.

Server Counts						
<input checked="" type="checkbox"/>	Type	Location	Heart Beat Time	CPU Usage (%)	Memory Free (KB)	Last Update Time
<input type="checkbox"/>	Primary	1A	04/20/2012 11:35:51	0.5	8640032	04/20/2012 11:35:46
<input type="checkbox"/>	Secondary	1B	04/20/2012 11:35:32	0.2	15428428	04/20/2012 11:35:09
<input checked="" type="checkbox"/>	Ancillary	1C	04/20/2012 11:35:32	0.2	1676140	04/20/2012 11:35:45

**Figure 25: Selected Columns**

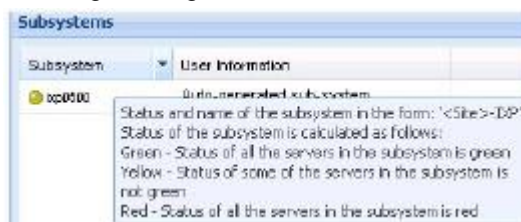
**Note:** Column options differ according to the object selected

## Changing Column Width

You can change the width of the column by placing the cursor on the column margin and dragging it to the desired width.

## Column rollover Function

This function enables you to view a description of the column heading when you place the cursor over the column heading. The figure below shows a column heading description.



**Figure 26: Rollover Function showing Column Description**

## Moving Columns

You can also organize columns by moving them to different positions in the table. Complete these steps to move a column to a different position in the table.

1. Place the cursor on the column header you want to move shown in the figure below. The column is highlighted.

Type	Location	Heart Beat Time	CPU Usage (%)	Memory Free (K)	Last Update Time	Start Date and Time
Primary	1A	04/20/2012 12:18:52	0.3	8640032	04/20/2012 12:18:47	N/A
Secondary	1B	04/20/2012 12:18:31	0.3	15428428	04/20/2012 12:18:10	N/A
Ancillary	1C	04/20/2012 12:18:32	0.2	1676140	04/20/2012 12:18:46	N/A

**Figure 27: Sort/ Column Menu**

2. Drag the cursor to the desired position in the table. Double arrows (not shown) show the column position.

Server	Follows	CPU Usage (%)	Role	Location	Monitoring On	Assign	Heart Beat Time
svt-lm1-1a	IS	19	ActMaster	1A	svt-lm1-1a_1	29	15/10/2008 03:38:44

**Figure 28: Sort/ Column Menu**

3. Release the cursor when you have moved the column to the desired position. The column is now in the new position.

Server	CPU Usage (%)	Type	Memory Free	Last Update Time	Start Date and Time
bp108-1a	2.7	Primary	290558	23/09/2008 20:30:45	23/09/2008 08:03:00

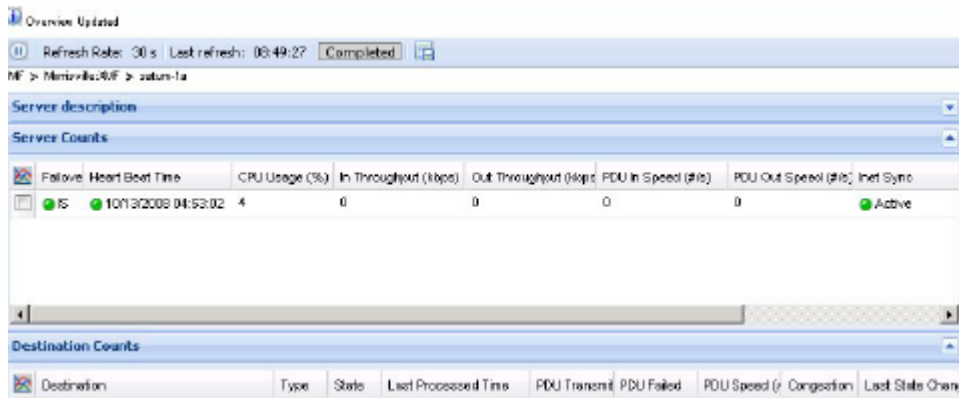
**Figure 29: Sort/ Column Menu**

You can perform this procedure for any of the columns.

### Expanding and Collapsing Table in an Overview Screen

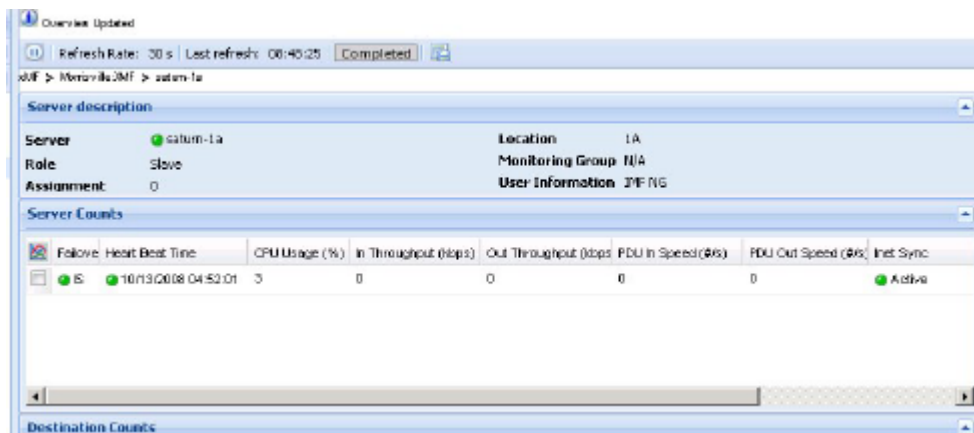
You can expand and collapse overview tables in a monitoring screen. Each overview table has an arrow on the right-hand side of the table heading (or on the heading itself). Clicking on it will expand or collapse the overview tables.

**Note:** Expanding a table causes the screen to be automatically refreshed.



The screenshot shows the 'Overview Updated' window. At the top, it displays 'Refresh Rate: 30 s' and 'Last refresh: 00:49:27' with a 'Completed' status. Below this is a breadcrumb trail: 'MF > Meriville:MF > saturn-1a'. The 'Server description' table is collapsed, showing only its heading. Below it is the 'Server Counts' table, which is expanded and shows a single row of data for 'IS' with various metrics like CPU Usage, In/Out Throughput, and PDU speeds. At the bottom, the 'Destination Counts' table is also collapsed, showing only its heading.

**Figure 30: Collapsed (Server Description) Table in Overview Screen**



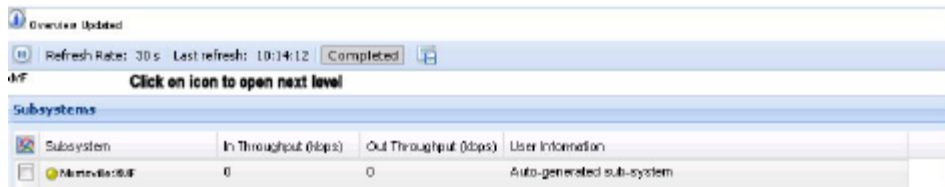
The screenshot shows the 'Overview Updated' window with the 'Server description' table expanded. It displays details for 'saturn-1a', including its 'Role' (Slave), 'Assignment' (0), 'Location' (1A), 'Monitoring Group' (N/A), and 'User Information' (JMF NS). Below this, the 'Server Counts' table is expanded and shows the same data as in Figure 30. The 'Destination Counts' table remains collapsed at the bottom.

**Figure 31 : Expanded (Server Description) Table in Overview screen**

### Drill-down Function from Overview Screens

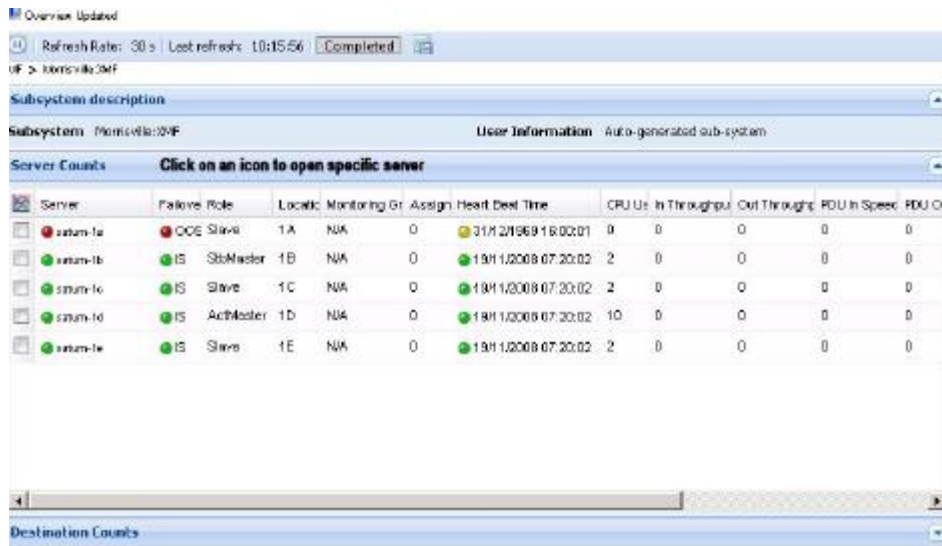
You can use the drill-down function by clicking on the icon from an overview table. Whenever you see the "hand" icon appear in place of the cursor, you can click on it to open the next level. In the example here, the drill down begins at the *Subsystem overview* level and then proceeds down to the *Server* and finally to a specific server.





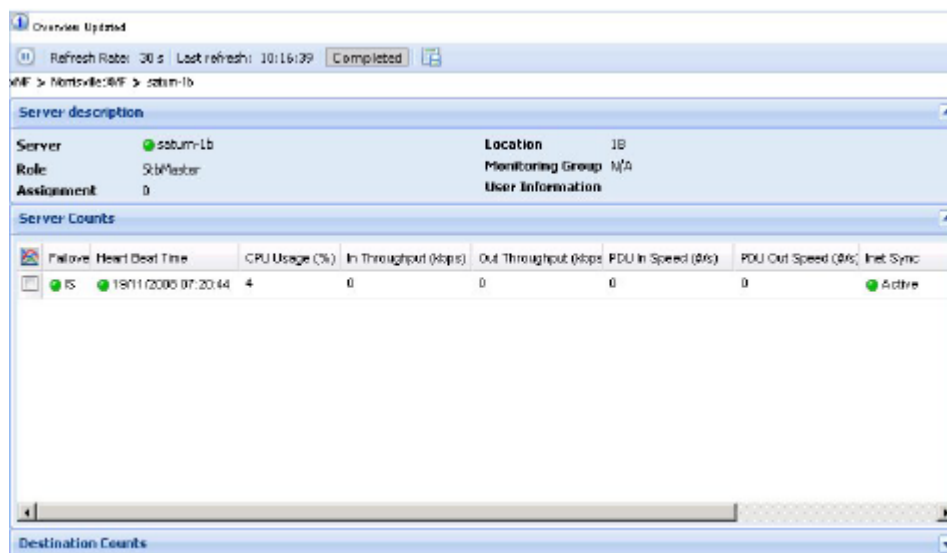
**Figure 32 : Subsystem Overview Screen**

Clicking on icon in the **Subsystem** column opens the Server Overview screen shown in figure below



**Figure 33 : Server Overview Screen**

Clicking on an icon in the **Server** column opens the specific server shown in the figure below.



**Figure 34 : Specific Server Screen**

## About Diagnostic Utility Perspectives

The *Diagnostic Utility Object* tree provides different perspectives of the monitored elements. Each perspective is presented in a stack panel. *Diagnostic Utility* presents the data by providing two main perspectives:

- Sites - this perspective shows you how the subsystems/servers are physically organized. You can select the subsystems/servers you want to monitor.
- Servers - this perspective shows all subsystems/servers grouped by type (for example xMF or IXP). This perspective is view-only and is used only to select the subsystem or server you want monitor.

Using these two perspectives, you can perform the operations required to monitor an PIC system. The figure shown here provides an example of Diagnostic Utility's two perspectives.

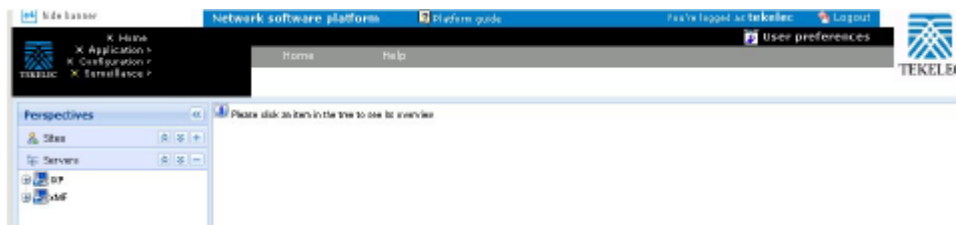


Figure 35 : Diagnostic utility Default view (Home Page)

## About sites Perspective

Sites perspective structure:

The root of the tree is called Sites.

Under the root, the objects for all the sites are displayed.

Under the site tree the subsystems of this site are displayed.

Under the subsystem tree, the servers of this subsystem are displayed.

### About the Sites perspective Elements right-click Menu

The right-click menu provides a convenient means of viewing specific counts for, sites, subsystems and servers. The following lists show the options available at each level.

In the *Site* perspective, you can view subsystems and servers that exist in different sites. The right-click pop-up menu for each level (root, subsystem and server) has the following options:

#### Sites - root level right-click Options

- Refresh - refreshes all the sites in the object tree

- Multiple sites overview - enables you to monitor multiple sites that you have selected in the object tree

#### **Sites - site level right-click Options**

- Refresh -refreshes the selected site in the object tree
- Multiple IXP subsystems - enables you to view the counts of multiple IXP subsystems you have selected within a site--select the subsystems and then click the *Site* to view them.
- Multiple IXP servers - enables you to view the counts of multiple IXP servers you have selected within a site. Select the servers using the check boxes and then right-click the Site object to view them.
- Multiple xMF subsystems - enables you to view the counts of multiple xMF subsystems you have selected within a site -- select the subsystems using the check boxes and then right-click the *Site* to view them.
- Multiple xMF servers - enables you to view the counts of multiple xMF servers you have selected within a site -- select the servers using the check boxes and then right-click the Site to view them.

#### **Sites - IXP subsystem level right-click Options**

- Refresh
- Streams
- Sessions
- Data Flow Processings
- Store
- Hardware Counters
- Multiple Servers Overview (option active only if multiple servers are selected)

#### **Sites - IXP server level right-click Options (Base Server)**

- Streams
- Data Flow Processings
- Hardware Counters

#### **Sites - IXP server level right-click Options (Storage Server)**

- Hardware Counters

- Store

#### **Sites - xMF subsystem level right-click Options**

**Note:** The right-click menu shows only the options available for that subsystem. For example, if there is no PMF subsystem existing in the site, the *reset* options will be grayed out.

- Refresh
- xMF servers
- Destinations
- Level 1 (PMF only)
- IP Devices (PMF only)
- Hardware Counters
- Reset Input Counts
- Reset Destination Counts
- Reset Level 1 Counts (PMF only)
- Reset IP Counts (PMF only)
- Multiple Servers Overview

#### **Sites - xMF server level right-click Options**

- xMF servers
- Destinations
- Level I (PMF only)
- IP Devices (PMF only)
- Hardware Counters

### **About servers Perspective**

The root of the tree is called *Servers*.

Under the root, the tree nodes for particular subsystem types are displayed. Name of these nodes are *IXP* and *xMF*.

Under the *IXP* root are the *IXP* subsystems and under the *xMF* root are the *xMF* subsystems.

Under the *IXP* subsystem node are the Base servers and Storage Pool servers.

**Note:** The Base servers include all the *IXP* servers Base and Storage Pool. The Storage Pool node only shows the storage servers.

## **About Server Perspective subsystem right-click Menu**

### **Servers - IXP root level right-click Options**

- Multiple Subsystems - enables you to view the counts of multiple IXP subsystems you have selected within a site(s)
- Multiple Servers - enables you to view the counts of multiple IXP servers you have selected within a site(s).

### **Servers - IXP subsystem level right-click Options**

- Refresh
- Streams
- Sessions
- Data Flow Processings
- Store
- Hardware Counters
- Multiple Servers Overview

### **Servers - IXP Base server level right-click Options**

- Streams
- Data Flow Processings
- Hardware Counters

### **Servers - IXP Storage Pool server level right-click Options**

- Store
- Hardware Counters

### **Servers - xMF root level right-click Options**

- Refresh - refreshes the screen

- Multiple xMF Subsystems - enables you to view the counts of multiple xMF subsystems you have selected within a site(s)
- Multiple xMF Servers - enables you to view the counts of multiple xMF servers you have selected across one or more sites

#### **Servers - xMF subsystem level right-click Options**

- Refresh
- xMF Servers
- Destinations
- Level 1 (PMF only)
- IP Devices (PMF only)
- Hardware Counters
- Reset Input Counts
- Reset Destination Counts
- Reset Level 1 Counts (PMF only)
- Reset IP Counts (PMF only)
- Multiple Servers Overview

#### **Servers - xMF server level right-click Options**

- xMF servers
- Destinations
- Level 1 (PMF only)
- IP Devices (PMF only)
- Hardware Counters

## Chapter3: Configuring Diagnostic utility

---

*About Preferences*

*Selecting Overview Screen Refresh Rate*

*Configuring Preferences for IXP Overviews*

*Configuring preferences for xMF Overviews*

*Selecting preferences for Sites*

## About Preferences

You can configure the Diagnostic Utility screens to fit your needs by using the Preferences option.

**Note:** To set *global preferences* such as Time settings, you must use the *User Preferences* option. See *NSP Platform Guide* for information on setting global preferences.

The *Preferences* menu provides a number of options. Each option is described in this chapter and enables you to select the following options:

- Overview refresh rate
- What tables are *expanded* by default

To open the *Preferences* screen, select from the *Diagnostic Utility Menu bar* **Home > Preferences**. The *Preferences* screen is displayed shown in the figure below.



**Figure 36 : Preferences Screen**

The *Preferences* screen has the following components:

Field/component	Description
Object menu	lists the data objects; select the object on the left-hand panel of the screen by clicking on the expand (+) icon
Options	lists the options on the right-hand panel of the screen
Default all button	resets all the options to their default values
Update all button	updates all the changes to the screens

**Table 13 : Preferences Field Descriptions**

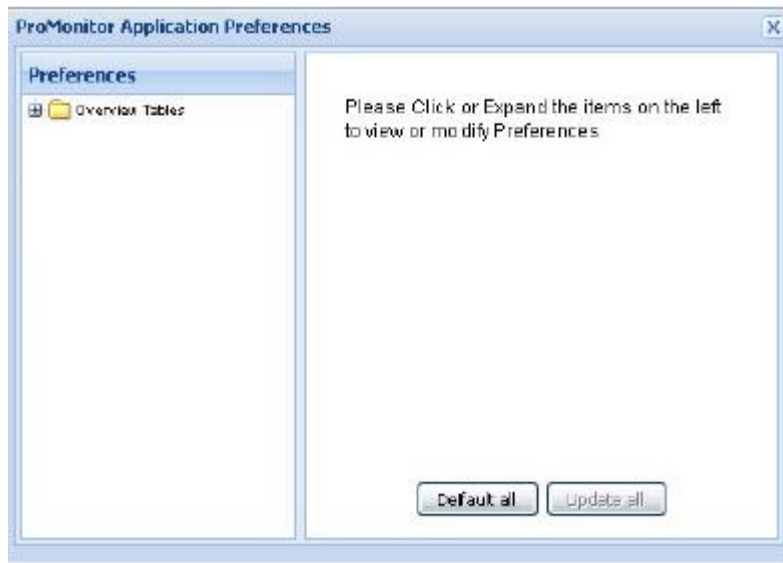


## Selecting Overview Screen Refresh Rate

The *overview screen refresh rate* function enables you to set how frequently the overview screens are refreshed. Complete these steps to set the refresh rate.

1. Select **Home > Preferences** from the *menu bar*.

The *Preferences* screen is displayed.



**Figure 37 : Preferences Screen**

2. Click on **Overview Tables** from the object tree.



**Figure 38 : Overview Screen with refresh rate**

The screen shows the refresh rate.

4. Click on the refresh rate from the drop-down menu.
5. Click Update all. The refresh rate is set.
6. Click the x on the top right-hand corner to close the screen.

**Note:** To reset the refresh rate to its default (30 seconds) click *Defaults* on the *Preferences* screen. See [Main Screen Functions](#) for more information on refresh rates.

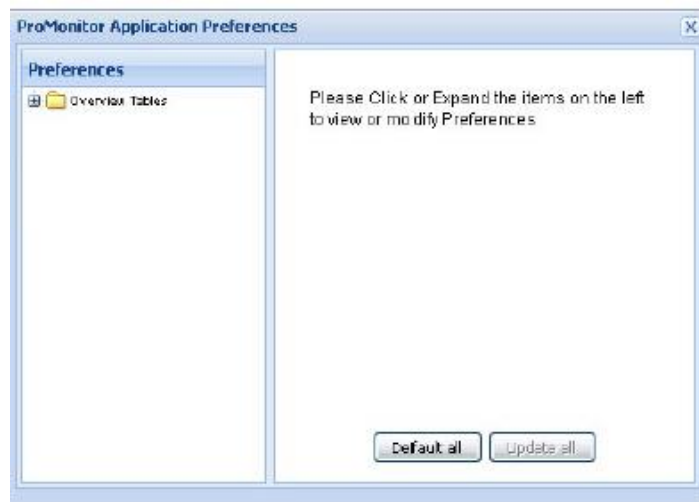
## Configuring Preferences for IXP Overviews

The *Preferences* operation enables you to set the various IXP overview tables to be expanded by default.

### Expanding IXP Root by Default

Complete these steps to expand the IXP root by default.

1. Select **Home > Preferences** from the menu bar.



**Figure 39 : Preferences Screen**

2. Expand Overview Tables (root) from the object tree.

The screen shows the object menu.



**Figure 40 : Expanded Overview Menu**

3. Click on IXP in the tree. The subsystem option screen is displayed



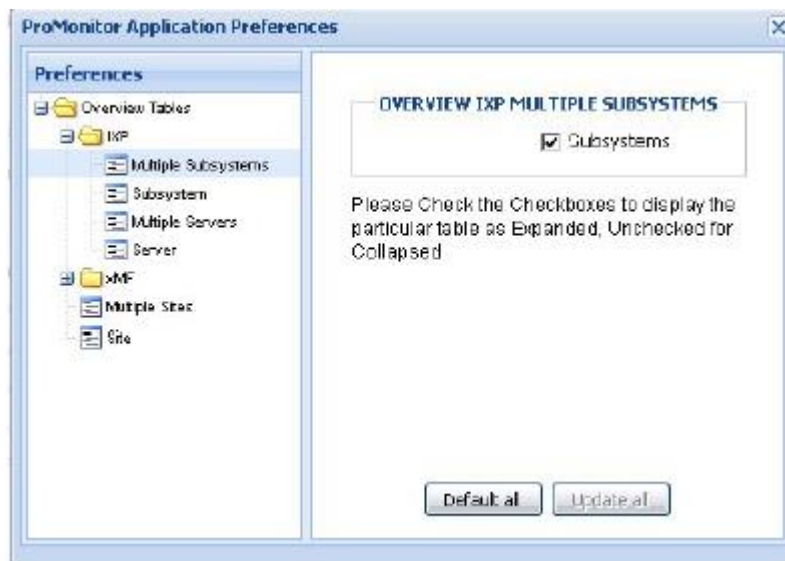
**Figure 41 : Expanded Overview Menu**

4. Select or de-select the **Overview IXP root** option.
5. Click **Update all**.  
The preferences are set.

### Expanding IXP Multiple Subsystems as a Default Setting

Complete these steps to expand IXP multiple subsystems as a default.

1. In the Configuration screen expand the **Object** menu.
2. Click on the **IXP table** to be expanded.
3. Click on **Multiple Subsystems**.



**Figure 42: Selected IXP Multiple Subsystems**

4. Select or de-select **Subsystems**. Selecting *Subsystems* expands the *Subsystems* menu as a default setting.
5. Click **Update All**. The IXP settings are updated.

### Expanding Subsystem Parameters by Default

Complete these steps to expand specific subsystem overview tables by default.

1. In the configuration screen expand the Object Menu
2. Click on IXP
3. Click on the subsystem on the object tree.

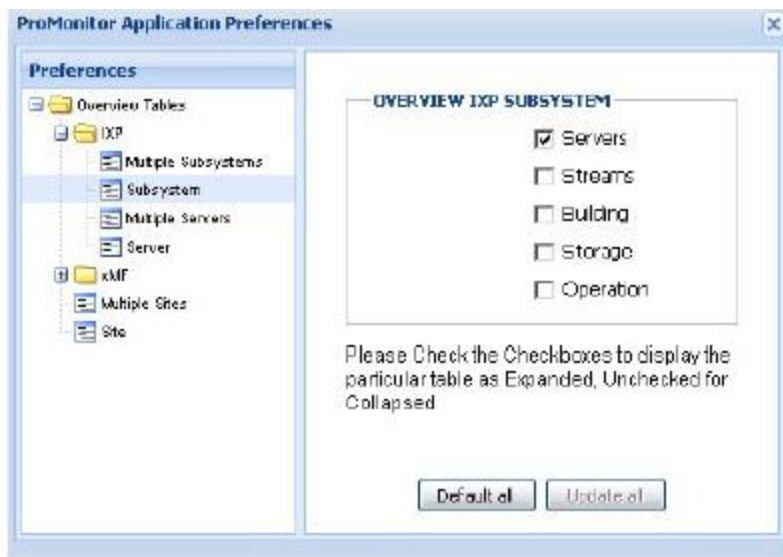


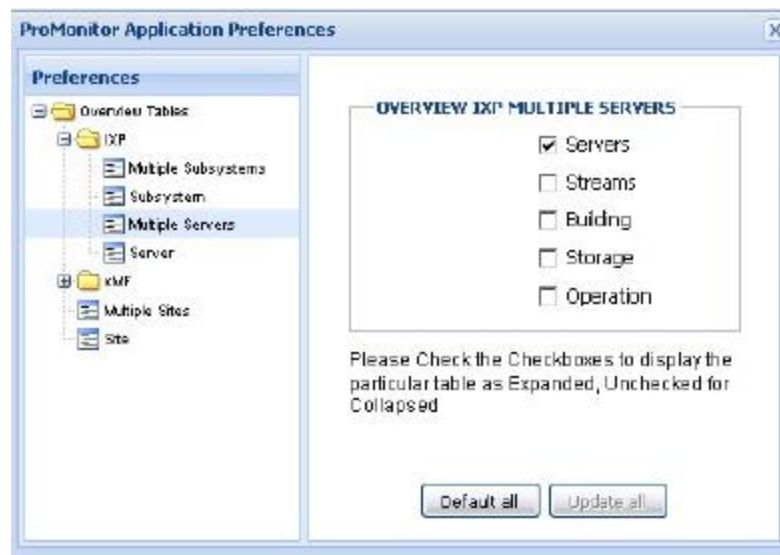
Figure 43: IXP Subsystem

4. Select or de-select the **IXP tables** you want expanded or collapsed.
  - a) Servers Streams
  - b) Building
  - c) Storage
  - d) Operation
5. Click **Update All**. The IXP settings are updated.

### Expanding Multiple Servers by Default

Complete these steps to expand multiple server overview tables by default.

1. In the Configuration screen expand the **Object** menu.
2. Click on the **IXP**.
3. Click on **Multiple Servers** on the object tree.



**Figure 44: IXP Multiple Servers**

4. Click on the appropriate **check boxes** for the items expanded on the screen.
5. Click **Update All**.
6. The IXP settings are updated.

## Expanding a single server by Default

Complete these steps to expand a single server overview tables by default.

1. In the Configuration screen expand the **Overview Tables** menu.
2. Select **IXP > Server**. The screen shows the overview IXP server options.

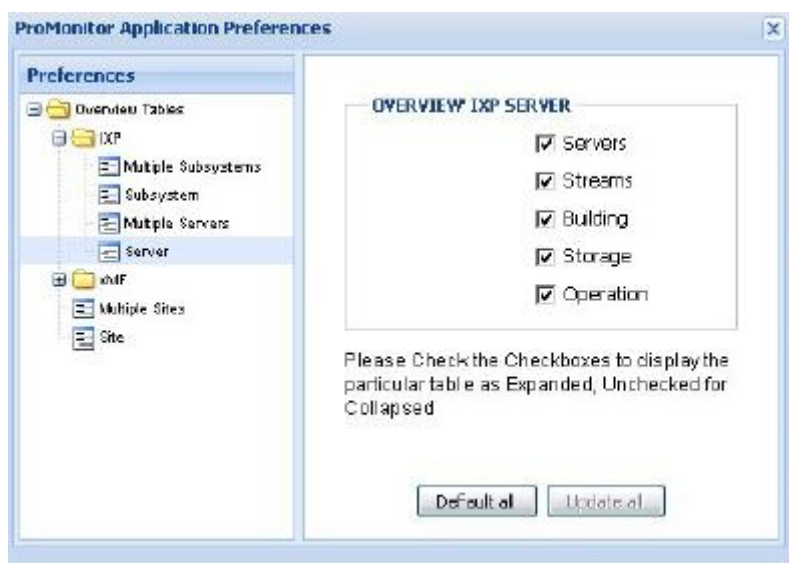


Figure 45 : IXP Single Server

3. Select or de-select the **IXP tables** you want expanded or collapsed. The options are:
  - a) Servers
  - b) Streams
  - c) Building
  - d) Storage
  - e) Operation
4. Click **Update All**. The IXP settings are updated.

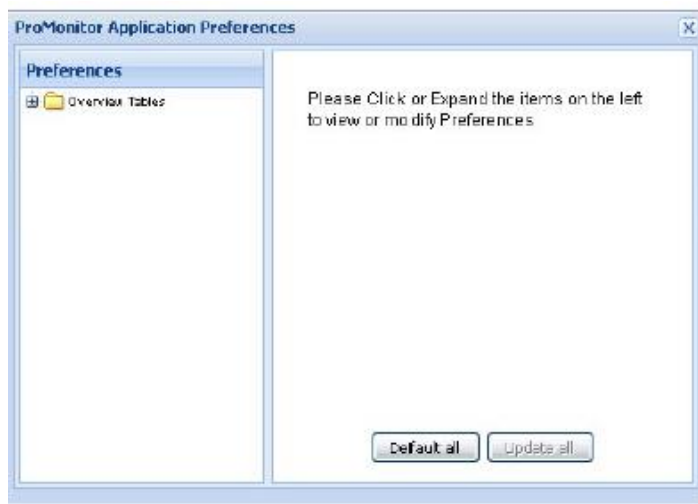
## Configuring preferences for xMF Overviews

The Preferences operation enables you to set the various xMF overview tables to be expanded by default.

### Expanding xMF Root by Default

Complete these steps to expand the xMF root by default.

1. Select Home > Preferences from the menu bar. The Preferences screen opens.



**Figure 46 : Preferences Screen**

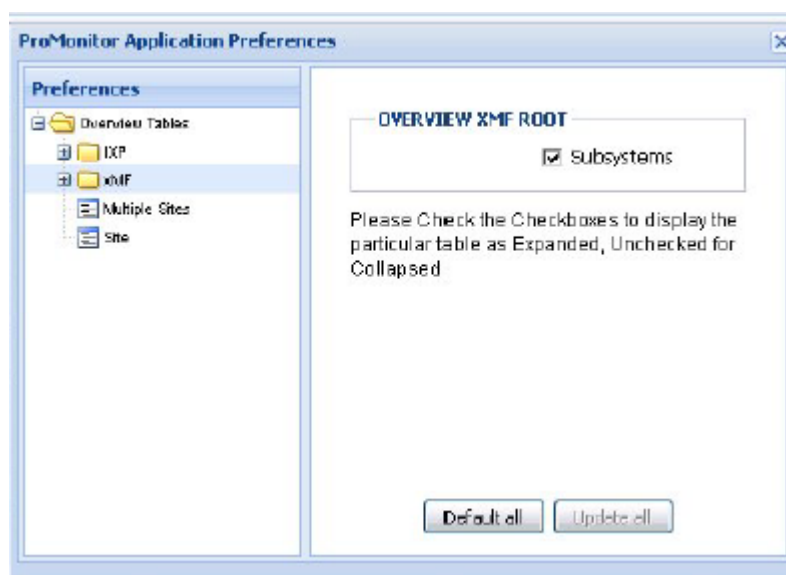
2. Expand Overview tables (root) from the object tree. The screen changes to show the object menu shown here





**Figure 47 : Expanded Overview Menu**

3. Click on xMF on the tree. The subsystems option screen opens shown below.



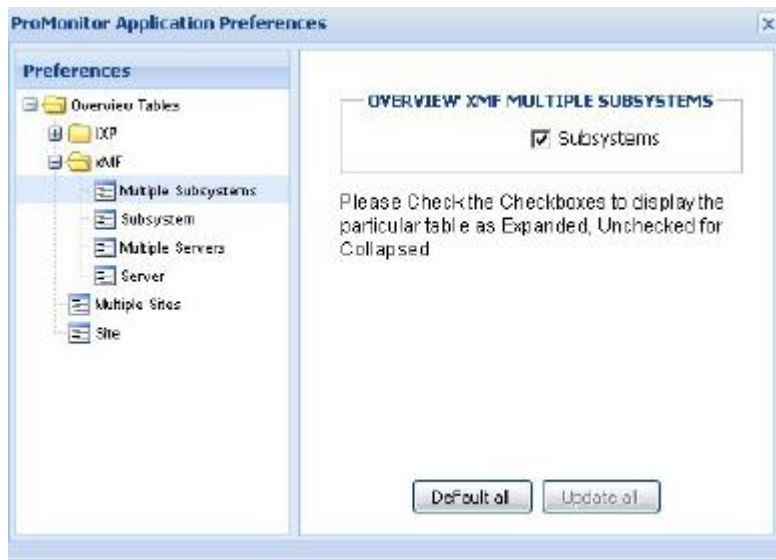
**Figure 48 : XMF Selected on Object Tree**

4. Select or de-select the Overview xMF root option to expand or collapse the subsystem table.
5. Click Update all. The preferences are set.

### Expanding xMF Multiple Subsystem as a Default Setting

Complete these steps to configure xMF subsystems to expand Multiple Subsystems as a default setting.

1. In the Configuration screen expand the **Object** menu.
2. Click on **xMF**.
3. Click on Multiple Subsystems.



**Figure 49 : Selected xMF Multiple Subsystems**

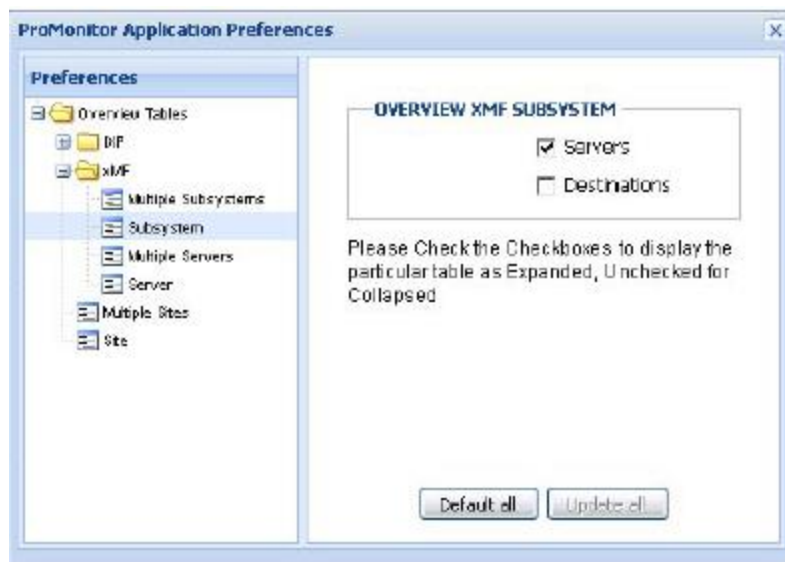
4. Select or un-select Subsystems.
5. Selecting Subsystems expands or collapses all subsystems by default.
6. Click Update All.

The xMF settings are updated.

### Expanding xMF Subsystem Parameters as a Default Setting

Complete these steps to expand xMF subsystem overview tables as a default setting.

1. In the Configuration screen expand the **Object** menu.
2. Click on **xMF**.
3. Click on Subsystem on the object tree.



**Figure 50 : xMF Subsystem**

4. Select or un-select the appropriate **check boxes** for what overview tables are expanded or collapsed on the screen.
  - a) Servers
  - b) Destinations
5. Click **Update All**.

The xMF subsystem settings are updated.

### Expanding xMF Multiple Servers as a Default Setting

Complete these steps to expand specific xMF multiple server tables by default.

1. In the Configuration screen expand the Object menu.
2. Click on xMF.
3. Click on Multiple Servers on the object tree.

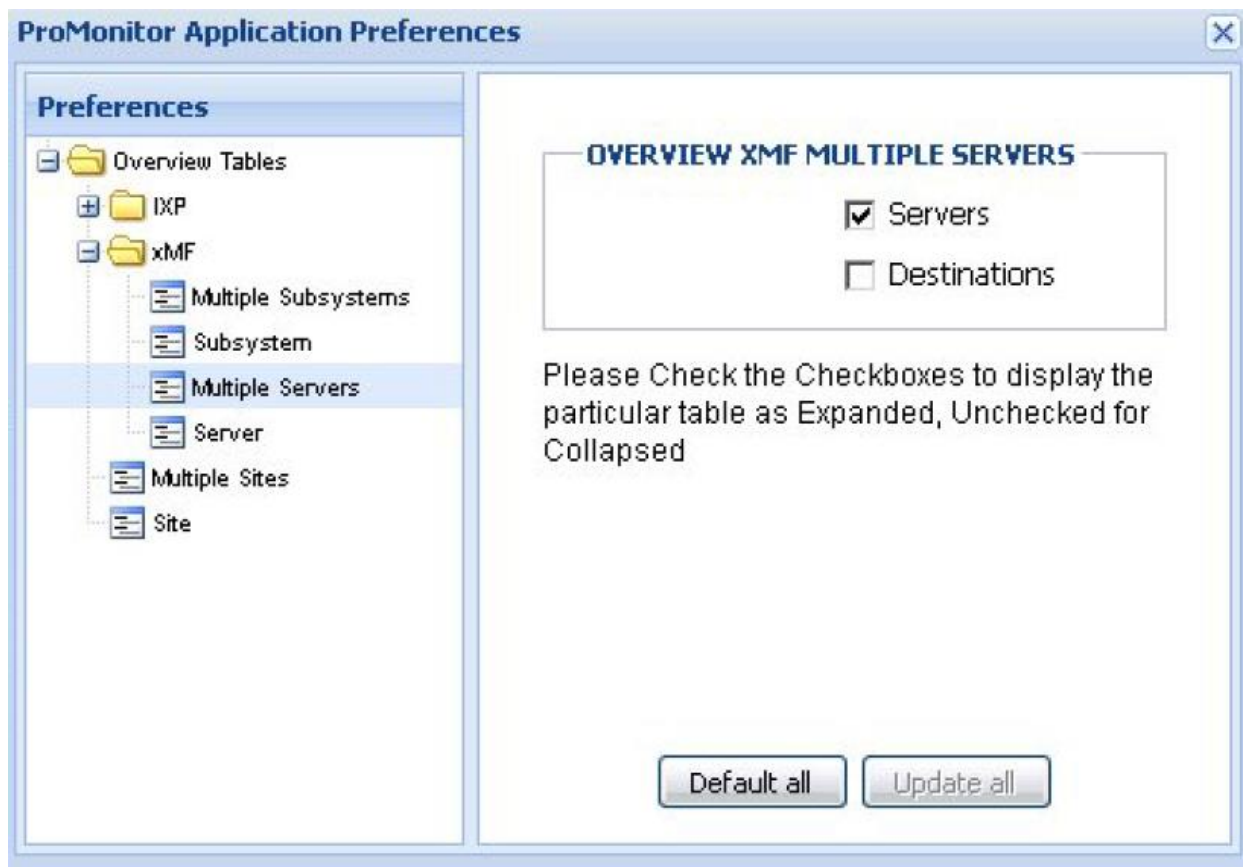


Figure 51 : XMF Multiple Subsystem

4. Select or un-select the appropriate **check boxes** for what overview tables are expanded or collapsed on the screen.
  - a) Servers
  - b) Destinations
5. Click **Update All**. The xMF multiple servers settings are updated.

## Expanding xMF a Single Server Settings by Default

Complete these steps to set xMF a single server tables to expand by default.

1. In the Configuration screen expand the **Object** menu.
2. Select **xMF > Server** from the *Object* tree.

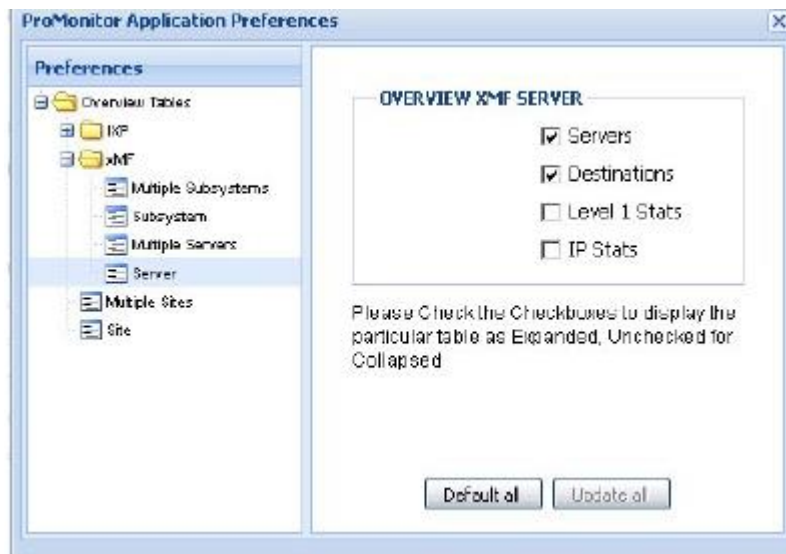


Figure 52 : XMF Server Level

3. Select or un-select the appropriate **check boxes** for what overview tables are expanded or collapsed on the screen.

- a) Servers
- b) Destinations
- c) Level 1 Stats
- d) IP Stats

4. Click **Update All**. The xMF server settings are updated.

## Selecting preferences for Sites

*Diagnostic Utility Preferences* operation enables you to view the xMF or IXP servers that reside on one or more sites.

Complete these steps to expand by default the xMF or IXP servers on one or more sites.

1. Select **Multiple Sites** from the object tree.



**Figure 53 : Multiple Sites Preference Screen**

2. Select either or both:

- a) IXP Subsystems - enables you to expand by default the IXP servers on more than one site
- b) XMF Subsystems - enables you to expand the IMF or PMF servers that reside on more than one site

### Selecting One-site Servers

Complete these steps to expand by default the servers that reside on one site

1. Select Site from the object tree.



**Figure 54 : Selected Server**

2. Select either or both

- a) IXP Subsystems - enables you to expand all the IXP servers that reside on that site
- b) XMF Subsystems - enables you to expand all the IMF or PMF servers that reside on that site

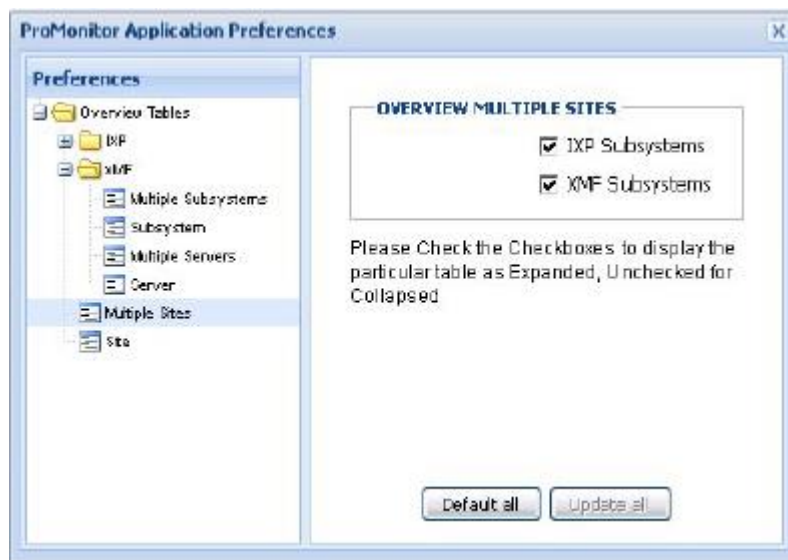
3. Click Update all to save your changes to the system.

4. Click the Close Icon (X) on the top right-hand corner to close the screen

## Configuring Multiple Sites Preference

Complete these steps to configure preferences for xMF multiple sites.

1. In the Configuration screen expand the **Multiple Sites option** on the object menu.



**Figure 55 : Multiple Sites**

2. Select the appropriate check boxes for what tables will be expanded by default in the screen for this view.
  - a) IXP Subsystems - enables you to expand all the IXP servers that reside on more than one site
  - b) XMF Subsystems - enables you to expand all the IMF or PMF servers that reside on more than one site
3. Click Update all to save changes.
4. Click the Close Icon (X) on the top-right corner to close the screen.

## Configuring Site Preferences

Complete these steps to expand by default the tables on an xMF site.

1. In the Configuration screen expand the **Site option** on the object menu.





**Figure 56 : Sites**

2. Select the appropriate **check boxes** for the tables to be expanded by default on the screen for this view.
  - a) IXP Subsystems - enables you to expand all the IXP servers that reside on that site
  - b) XMF Subsystems - enables you to expand all the IMF or PMF servers that reside on that site
3. Click **Update all** to save changes.
4. Click the **Close Icon (X)** on the top right corner to close the screen.

## Chapter4: Monitoring Functions

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*Monitoring Multiple Sites and Subsystems*

*Monitoring One Site or Subsystem*

*Monitoring IXP Subsystems and Servers*

***The IXP Subsystem and Server Right-click Menu***

*Dataflow Processing Drill-down Procedures*

*Monitoring xMF Subsystems and Servers*

*The xMF Subsystem and Server Right-click Menu*

*About Hardware Counters*

*About Reset Count Options for xMF Subsystems*

*Exporting Overview Tables in CSV Format*

## Monitoring Multiple Sites and Subsystems

In the Site perspective you can monitor:

- All the sites created in your system
- An entire site which includes the subsystems and servers within a particular site
- All subsystems (xMF and IXP) that exist in your system
- All the servers (xMF and IXP) that exist within your system

### Monitoring Subsystems from Multiple Sites

Using Diagnostic Utility you can monitor the subsystems on several sites at one time. Complete these steps to monitor IXP and xMF subsystems across multiple sites.

1. Select the **Sites** perspective.
2. Click **check boxes** to select one or more **sites**.
3. Select the **Sites** node again.
4. Right-click and select **Multiple Sites Overview** from the pop-up menu. The Site overview screen opens, shown below divided into:
  - a) IXP subsystem
  - b) xMF subsystem

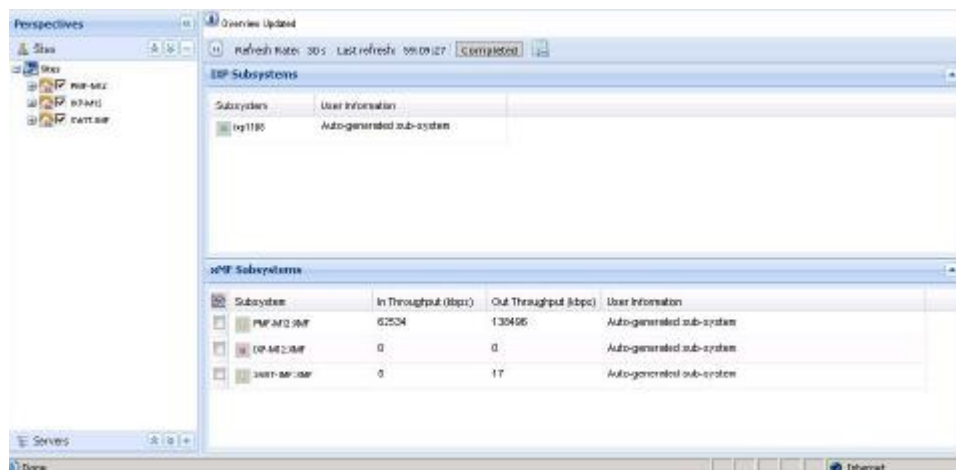
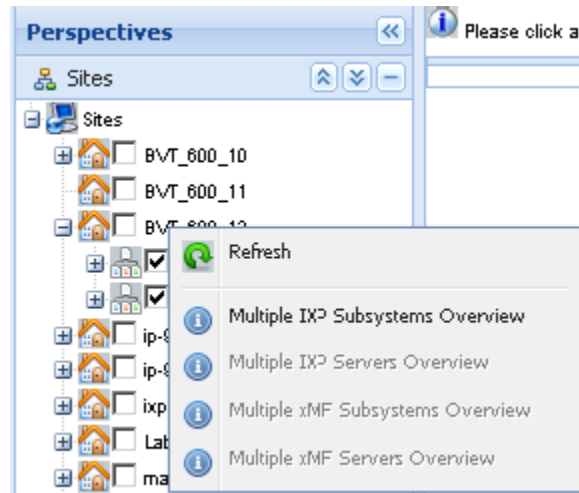


Figure 57 : Multiple Site Overview

From this screen you can monitor the counts on any IXP or xMF subsystem in the selected sites.

## Monitoring Multiple Subsystems within a Site

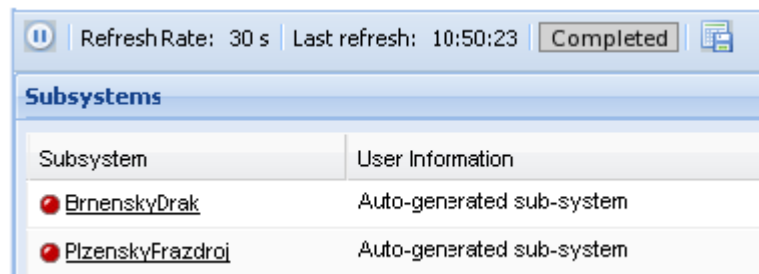
You can monitor multiple subsystems within a site by using the *Multiple IXP/xMF Subsystems Overview* options in the *right-click* menu shown in the figure below.



**Figure 58 : Right Click Pop up menu with multiple subsystem overview options**

Complete these steps to view multiple IXP or xMF subsystems within a site. **Note:** In this example, IXP subsystems are selected.

1. Select the **Sites** perspective.
2. Expand the **site tree** to view the subsystem(s) that you want to monitor.
3. Select the **check boxes** for the **same type subsystems** (either IXP or xMF) you want to monitor.
4. Right-click on the **site** that you want to monitor. The pop-up menu opens.
5. Select either the **Multiple IXP Subsystems Overview** or the **Multiple xMF Subsystems Overview** to show the appropriate overview.



**Figure 59 : Multiple Subsystems (IXP) Overview**

## Monitoring Multiple Servers within a Site

You can monitor multiple subsystems within a site by using the Multiple IXP/xMF Servers Overview options in the right-click menu shown in the figure.

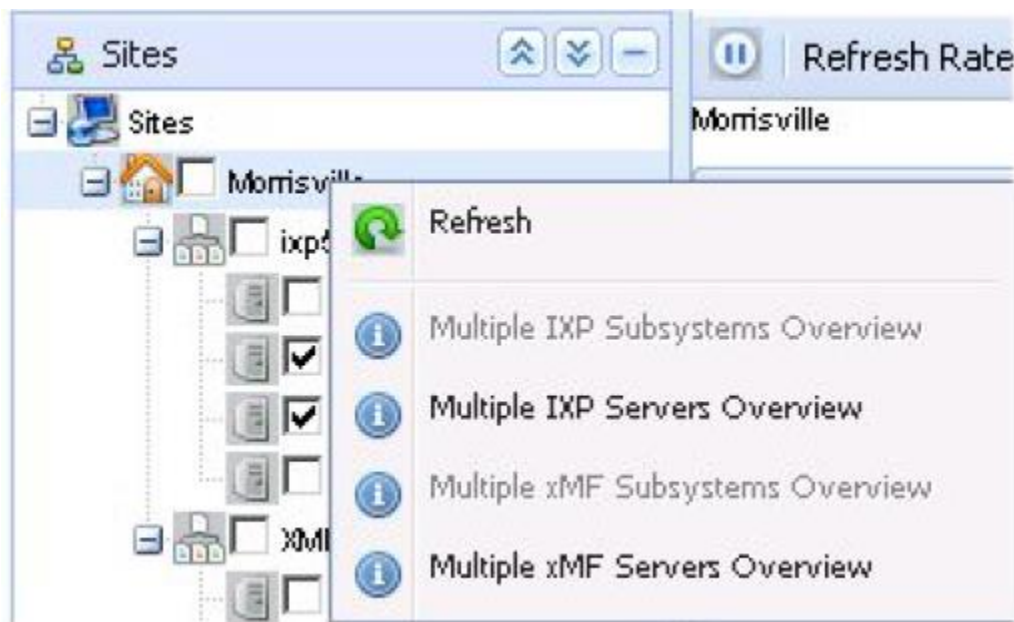


Figure 60 : Popup Menu with Multiple Server Overview Option

Complete these steps to view multiple *IXP* or *xMF* servers within a site.

1. Select the **Sites** perspective.
2. Expand the **site name** you want to monitor.
3. Select the **servers** to be monitored.
4. Right-click on the **site name** that you want to monitor. The pop-up menu opens.
5. Select either the **Multiple IXP Servers Overview** or the **Multiple xMF Servers Overview** to show the appropriate overview.

(The figure below shows multiple xMF server overview.)

**Note:** You cannot view both IXP and xMF servers at the same time.

Server	Platform	Role	Location	Monitoring Gr	Assign Heart Beat Time	CPU Util	In Throughput	Out Throughput	PDU In Speed	PDU Out
hobbs-1a	6	ActMaster	1A	hobbs-1a_Up 32	30/10/2008 17:04:50	25	127	363	474	725
hobbs-1b	6	Standby	1B	N/A	30/10/2008 17:04:50	7	0	0	0	0

Server	Destination	Type	Status	Last Processed Time	PDU Transmitted	PDU Failed	PDU Speed (K)	Congestion	Last State
hobbs-1a	hobbs-1a_mpp2	MPP	OK	31/12/1989 15:00:01	0	0	0	0	30/10/2008
hobbs-1a	ANSI_SUP_H0685	MPP	A	30/10/2008 17:04:47	4087394	0	230	0	30/10/2008
hobbs-1a	ANSI_SUP_H06851	DTS	A	30/10/2008 17:04:48	263049026	0	347	0	30/10/2008
hobbs-1a	ANSI_SUP_H06851	DTS	A	30/10/2008 17:04:48	257224079	0	348	0	30/10/2008

Figure 61 : Multiple xMF Servers Overview

## Monitoring One Site or Subsystem

Using the *Site* perspective you can monitor all the subsystems and servers that belong to one site. Complete these steps to select a subsystem or server within a site.

1. Select the **Sites** perspective.
2. Expand the **site** you want to monitor.

The entire site (shown in the figure) is presented divided into:

- a) Site overview
- b) IXP subsystem overview
- c) xMF subsystem overview

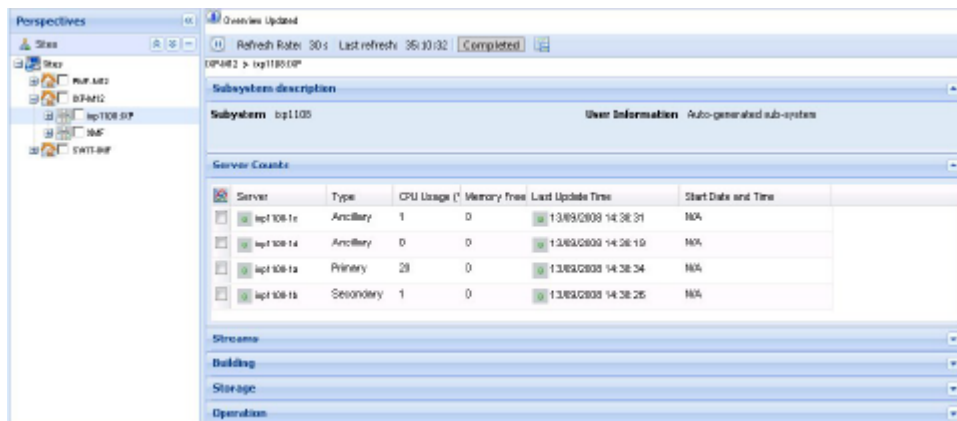


**Figure 62 : Entire Site Monitoring**

### Opening a Subsystem from the Overview Screen

Once you have opened a *Site Overview* screen. You can open any available subsystem by clicking on the **subsystem name (or the name on the tree)**. In the figure below, the IXP *subsystems* from have been opened showing all the servers belonging to that subsystem.

**Note:** All the procedures in this section can also be used to open xMF subsystems.



**Figure 63 : Subsystem Monitoring Screen (IXP)**

From this screen you can chart available parameters in the subsystem. (See "Charting Subsystems and Servers".) or you can open any of the parameters on the screen. (See *Monitoring IXP Subsystems and Servers*.)

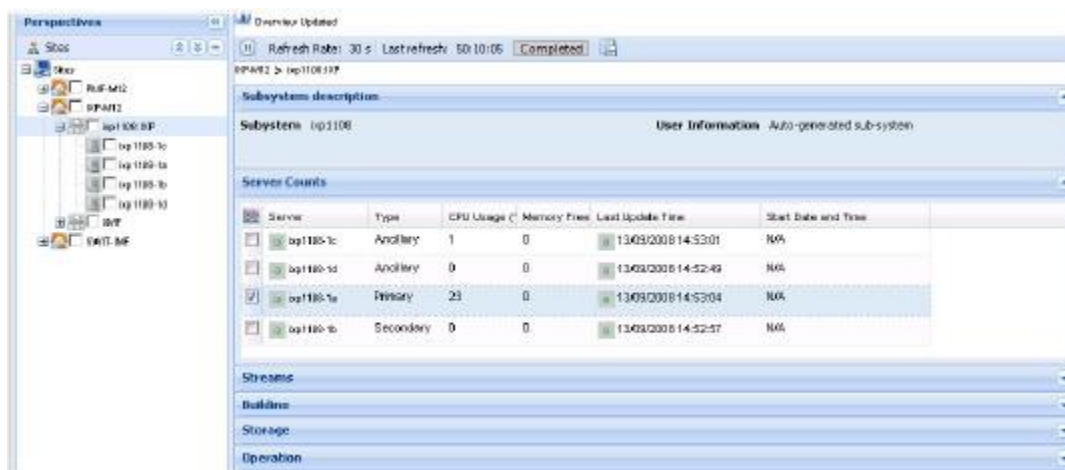
### Server Overview Screen

From the subsystem overview screen, you can open a specific server by performing either of these actions:

- Selecting the **server name** in the Server Counts table of the Subsystem overview screen (shown in the figure).
- Click on the **Server name** on the object tree Shown below.

**Note:** All the procedures in this section can also be used to open xMF servers.

**Note:** This same procedure can also be used in the Servers perspective.



**Figure 64 : Selected Server for Monitoring (IXP)**

The specific server monitoring screen opens shown in the figure.

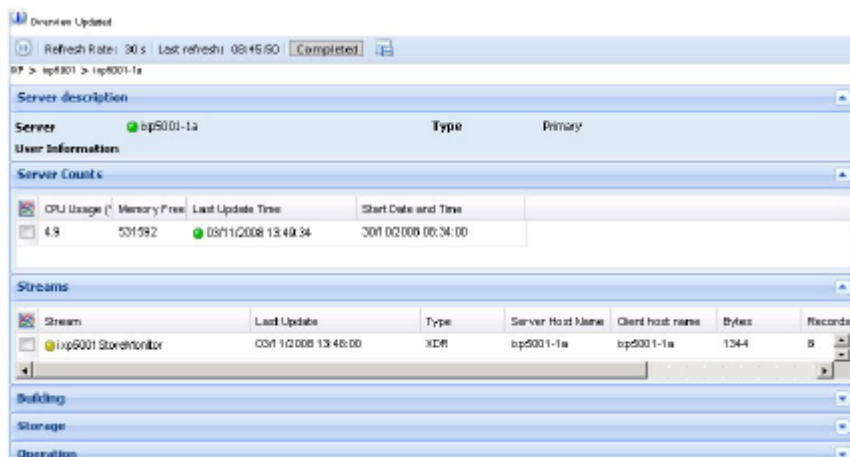


Figure 65 : Server Monitoring Screen (IXP)

## Monitoring IXP Subsystems and Servers

**Note:** You can monitor IXP subsystems and servers from either the Sites or Server perspective.

*Diagnostic Utility* enables you to monitor specific parameters on subsystems and servers. You open the subsystem by either selecting it from the object menu or drilling down from the site overview table.

IXP subsystems can be divided into Base Servers and Storage Pool servers. Expanding the IXP subsystem shows all the servers within the system.

Selecting any of the servers in the IXP hierarchy opens the table showing the parameters of server(s).

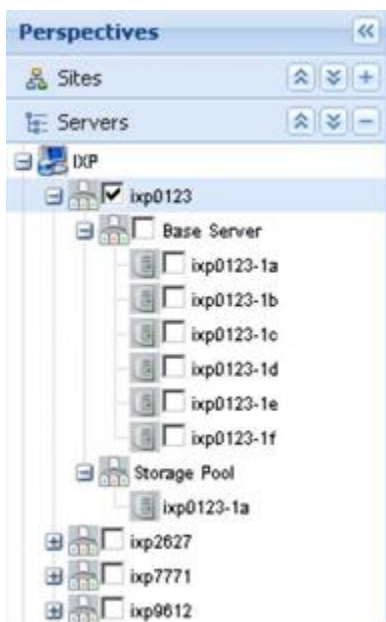


Figure 66 : Expanded IXP Subsystem



## Monitoring IXP Subsystems

You can view all of the IXP subsystems by selecting the IXP root in the Server perspective or a single subsystem by selecting that specific subsystem in either the Sites or Servers perspective. The figure and table show graphic representation and explanations of monitoring table.



**Figure 67 : IXP Root Overview Screen**

Parameter	Description
Subsystem Name + Subsystem status	Name of the subsystem and Status of the subsystem is calculated as follows: <ul style="list-style-type: none"> <li>Green - Status of all the servers in the subsystem is green</li> <li>Yellow - Status of some of the servers in the subsystem is not green</li> <li>Red - Status of all the servers in the subsystem is red</li> </ul>
User information	Shows information about the subsystem

**Table 14: IXP Root Overview Table**

## Viewing a Specific IXP Subsystem

Once you have opened an IXP subsystem, you can monitor these parameters shown in the figures and tables. The parameters are:

- Subsystem description
- IXP server counts
- IXP input stream
- IXP xDR build process
- IXP xDR store process
- IXP xDR operate process

To see an IXP subsystem overview, click on the IXP subsystem in either the sites, or subsystems perspective. The IXP subsystem monitoring table opens.

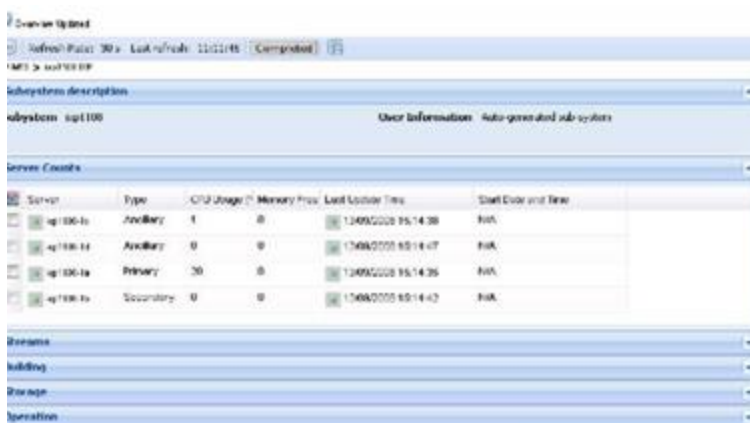


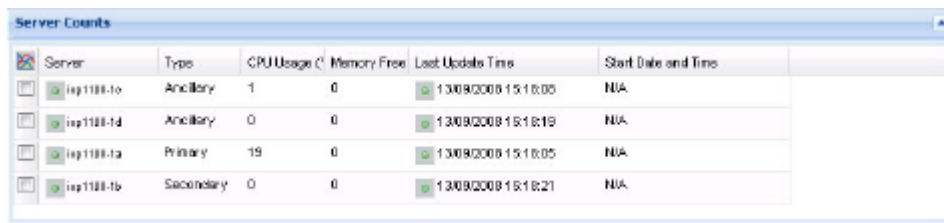
Figure 68 : IXP Subsystem Monitoring

Parameters	Description
Status and Server Name	<p>Status and name of the server. Status can be:</p> <ul style="list-style-type: none"> <li>Green - All the processes are in UP state (mandatory processes and other)</li> <li>Yellow - All mandatory processes are in UP state but there are some processes in some other state</li> <li>Red - None of the processes is in UP state</li> </ul> <p>For any IXP server mandatory processes are:</p> <p>For primary server - IxpPurge, IxpMonitor, IxpManage, IxpForward, JmxAgent, IxpDbWatchdog, sshKeyIXP, inetmerge, inetsync, mysqld, autozap, idbsvc0, idbsvc1, statclerk, IxpAdapt, IxpQuery and IxpHistory</p> <p>For secondary and ancillaries server - IxpManage, IxpForward, JmxAgent, IxpDbWatchdog, sshKeyIXP, inetmerge, inetsync, mysqld, autozap, idbsvc0, idbsvc1, statclerk, IxpAdapt, IxpQuery and IxpHistory</p>
User information	Information about the user name

**Table 15 : IXP Server Overview Information**

## IXP Server Counts

The figure and table below explain the server count parameters for an IXP subsystem.



Server	Type	CPU Usage (%)	Memory Free (KB)	Last Update Time	Start Date and Time
ixp100-1a	Ancillary	1	0	13/09/2008 15:18:05	N/A
ixp100-1d	Ancillary	0	0	13/09/2008 15:18:19	N/A
ixp100-1a	Primary	19	0	13/09/2008 15:18:05	N/A
ixp100-1b	Secondary	0	0	13/09/2008 15:18:21	N/A

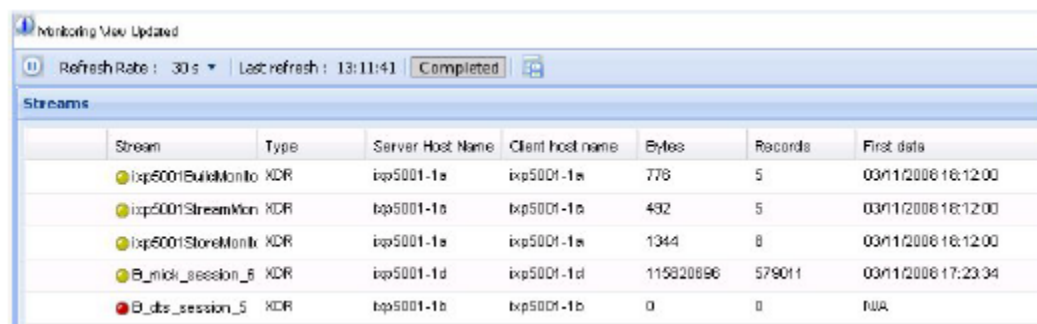
**Figure 69 : IXP Subsystem Server Count Table**

Parameter	Description
Server name*	Name of the server
Type*	Shows server role (primary, secondary, ancillary)
CPU Usage (%)	Shows percentage of CPU being used
Memory Free (KB)	Number of kilobytes of free memory
Last Update+ Status	Date and time when the last update was done for server statistics Status of the update request. It is calculated as follows: <ul style="list-style-type: none"> <li>Green - last refresh is less than or equals 2 minutes old</li> <li>Yellow - refresh is more than 2 minutes old</li> </ul>
Start date and Time	Date and time the server was started

**Table 16 : IXP Server Count Parameters**

\* denotes that these parameters are viewed only at the subsystem level.

The figure and table below explain the input stream count parameters for an IXP subsystem



Stream	Type	Server Host Name	Client Host Name	Bytes	Records	First data
ixp5001BulkMonit	XDR	ixp5001-1a	ixp5001-1a	778	5	03/11/2008 16:12:00
ixp5001StreamMon	XDR	ixp5001-1a	ixp5001-1a	492	5	03/11/2008 16:12:00
ixp5001StoreMonit	XDR	ixp5001-1a	ixp5001-1a	1344	8	03/11/2008 16:12:00
B_mick_session_6	XDR	ixp5001-1d	ixp5001-1d	115820896	579011	03/11/2008 17:23:34
B_dls_session_5	XDR	ixp5001-1b	ixp5001-1b	0	0	N/A

**Figure 70 : IXP Subsystem Stream Table**

Parameter	Description
Stream	Name of the stream with status icon. The status calculation is: <ul style="list-style-type: none"> <li>Blue - if stream is present in the CCM but not in IXP monitoring session</li> <li>Green - if stream is present in IXP monitoring session</li> </ul>
Last Update	Date and time of last update from this processing and the status calculated is: <ul style="list-style-type: none"> <li>If First Data is available and Last Update time of monitoring record is older than 5 minutes from current time, the LED color is RED.</li> <li>If First Data is available and Last Update time of monitoring record is older than 2 minutes from current time, the LED color is YELLOW</li> <li>If First Data is available and Last Update time is current, the LED color is GREEN</li> </ul>
Type	Type of the stream; it can either be xDR or PDU
Server Host Name	Name of the IXP server which is producer of this stream
Client host name	Name of the IXP server which is consumer of this stream
Bytes	Total number of bytes transmitted
Records	Total number of records transmitted
First data	Timestamp of the first record transmitted for the period of measure

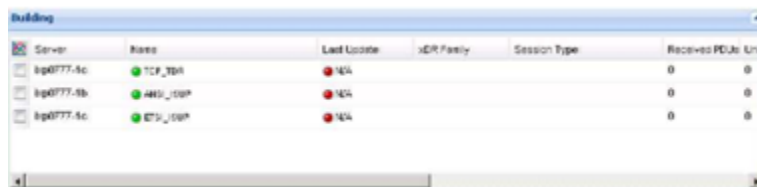
Table 17 : IXP Input Stream

## IXP XDR Build Process

The figure and table below explain the xDR build process count parameters for an IXP subsystem.

**Note:** xDR builders are constructed in layers. For example, one builder has three layers. A PDU that goes through each of the three layers is counted three times therefore, in the Overview table PDU counts may not reflect the actual number of PDUs but rather the number of times a PDU is counted. Actual counts are viewed in the Dataflow Processing table.

Figure 71 : IXP Subsystem Table



Server	Name	Last Update	xDR Family	Session Type	Received PDUs: Uniq
ip0777-5c	TCP_TDR	NA			0
ip0777-5b	4401_10P	NA			0
ip0777-5c	8751_10P	NA			0

Parameter	Description
Server Name*	Name of the server running the process
Name & Status Icon	Name of the data flow processing with status icon. It is a link to the process involved in this processing Status: <ul style="list-style-type: none"> <li>• Green - difference between current time and last update time is less than or equal to two minutes</li> <li>• Yellow - difference between current time and last update time is more than two minutes</li> <li>• Red -</li> </ul>
Last Update & Status Icon	Date and time of last update from this processing Status can be: <ul style="list-style-type: none"> <li>• Green - difference between current time and last update time is less than or equal to two minutes</li> <li>• Yellow - difference between current time and last update time is more than two minutes</li> <li>• Red - if application fails to retrieve the monitoring count</li> </ul>
xDR Family	One of - 1 GPRS, 2 GPRS or SS7, 3 SS7, 4 IP, 5 undefined, 6 VoIP, 7 VoIP or GPRS, 8 UMTS
Session type	1 reconstitution, 2 capture, 3 configurable, 4 KPI, 5 other statistics
Received PDUs	Last Value of PDU count submitted to the builder
Unknown PDU	Count of PDU which are not of the correct type. For instance, an IP frame in SS7 transport
Filtered PDU	PDUs rejected due to filtering conditions. This can be an explicit condition like a port number, or implicit like SIO=5 for ISUP
Not Stored PDU	Count of PDUs not stored. The reasons for not storing could be in the xDR builder configuration, general parameter "Store PDUs" not set, no space left on disk, writing not allowed on all PDU disks, wrong disk sharing or mounting
Received Bytes	Last Value of total number of bytes received (including PDU headers)
Generated xDRs	Last Value of produced xDR count
Valid xDRs	Last Value of xDR that could be correlated without suspicion of error
xDRs Not Transmitted	xDRs that could not be transmitted to the consumer (for instance - operate, store)
xDRs in Progress	Maximum number of in progress xDRs
Generated Bytes	Last Value of total number of bytes sent to a session, xDR record and variable parts

**Table 18 : IXP xDR Build Process Parameters**

\* denotes that these parameters are viewed only at the subsystem level.

## IXP xDR store process

The figure and table below explain the xDR store process count parameters for an IXP subsystem.

Server	Name	Last Update	Session	Received xDRs	Stored xDRs	Rejected record
bp0777-1c	ETSI_ISUP_CDR	03/11/2008 14:06:00	ETSI_ISUP_CDR 2179	2180	0	0
bp0777-1c	TCP_TDPS_stat	03/11/2008 14:07:00	TCP_TDPS	88	88	0

**Figure 72 : IXP Subsystem xDR Storage Process Table (Aggregated) Table**

Parameter	Description
<b>Server Name*</b>	Name of the server running the process
<b>xDR Store Process &amp; Status Icons</b>	Name of the data flow processing with status icon. It is a link to the process involved in this processing Status can be: <ul style="list-style-type: none"> <li>• Green - process is in UP</li> <li>• Red - process is in some other state</li> <li>• Blue - changes are applied in CCM but process not running in IXP</li> </ul>
<b>Pool Name</b>	Name of the pool where data is stored
<b>Last Update &amp; Status Icons</b>	Date and time of last update from this processing <ul style="list-style-type: none"> <li>• Green - difference between current time and last update time is less than or equal to two minutes</li> <li>• Yellow - difference between current time and last update time is more than two minutes</li> <li>• Red - process is in some other state</li> </ul>
<b>Session</b>	Name of the session in which xDR/KPI will be store
<b>Start Time</b>	Time the process started
<b>End Time</b>	Time the process ended
<b>xDR Count</b>	Sum of each similar storage counter for the pool
<b>xDR per second</b>	Average xDR per second for the period
<b>Stored Bytes</b>	Sum of each similar counts for the storage process
<b>throughput Mb/s</b>	Average MBit per second for the period
<b>Received xDR/KPIs</b>	Last Value of xDR/KPI count which is received by process
<b>Lag</b>	Delay of xDR storage calculated by Last Update Time - end time
<b>Lifetime</b>	Session lifetime calculated by end time - begin time
<b>Stored xDR/KPIs</b>	Last Value of total number of xDR/KPI count stored for this process
<b>Rejected records</b>	Last Value of xDR/KPI count rejected by this process

**Table 19 : IXP XDR Store Process Parameters-Subsystem Level**

\* denotes that these parameters are viewed only at the subsystem level.

## IXP xDR operate process

The figure and table below explain the xDR operate process count parameters for an IXP subsystem.

Operation						
Server	None	Last Update	Received xDR	xDRs Enriched	Created KPI	Filtered xDRs
ixp0777-1b	ANGI_SUP_CORE	03/11/2008 14:08:01	4515	0	4	4515

**Figure 73 : IXP Subsystem xDR Operate Process Table**

Parameter	Description
<b>Server Name*</b>	Name of the server running the process
<b>Name &amp; status</b>	Name of the dataflow processing with status: <ul style="list-style-type: none"> <li>• Green - difference between current time and last update time is less than or equal to two minutes</li> <li>• Yellow - difference between current time and last update time is more than two minutes</li> </ul>
<b>Last Update &amp; Status Icon</b>	Date and time of last update from this processing <ul style="list-style-type: none"> <li>• Green - difference between current time and last update time is less than or equal to two minutes</li> <li>• Yellow - difference between current time and last update time is more than two minutes</li> <li>• Blue - changes are applied in CCM but process not running in IXP</li> </ul>
<b>Received xDR</b>	Last Value of xDR count which are received for this process
<b>xDRs enriched</b>	Number of xDR getting at least one field enriched
<b>Created KPI</b>	Last Value of total number of KPIs created by this process
<b>Filtered xDRs</b>	Last Value of xDR count passing the corner filter

**Table 20 : IXP xDR Operate Process Parameters-Subsystem Level**

## The IXP Subsystem and Server Right-click Menu

The IXP subsystem or server right-click menu has the following options:

### IXP subsystem right-click menu options

- Refresh - refreshes the screen to show any changes that have occurred.
- Streams (Input Streams) - enables you to monitor all the input streams in a subsystem
- Sessions - enables you to monitor all the sessions in a subsystem
- Data Flow Processings - enables you to monitor all the building and operating DFPs in a subsystem
- Store - enables you to monitor all the storage DFPs residing in a subsystem
- Hardware counters - enables you to monitor hardware parameters such as storage space, disk space and Ethernet connections
- Multiple Servers Overview - enables you to view the servers on a selected IXP subsystem

### IXP base server right-click menu options

**Note:** Base servers are those servers designated for building or operating DFPs.

- Streams (Input Streams) - enables you to monitor all the input streams in a subsystem
- Data Flow Processings - enables you to monitor all the building and operating DFPs in a subsystem

- Hardware counters - enable you to monitor hardware parameters such as storage space, disk space and ethernet connections.

### IXP storage pool server right-click menu options

**Note:** Storage pool servers are those servers designated for storing DFPs.

- Hardware counters - enable you to monitor hardware parameters such as storage space, disk space and ethernet connections
- Store - enables you to view all the storage DFPs residing on a server

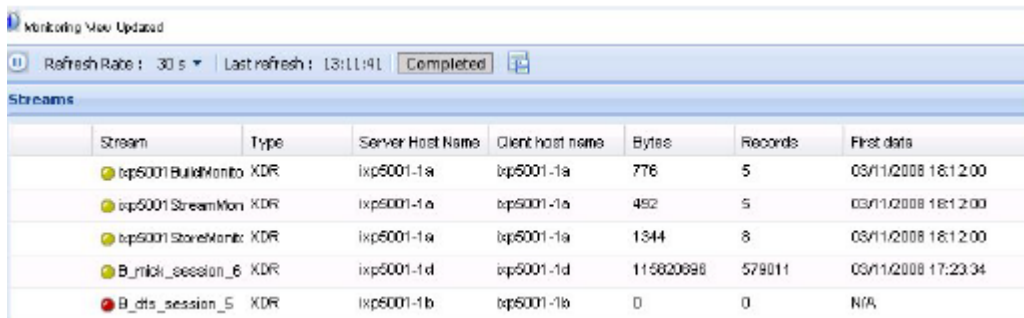
### Subsystem and Server Right-click Option

Diagnostic Utility right-click menu enables you view *Input Stream* information on that subsystem or a server on that subsystem. Right-click option is discussed below.

#### Monitoring streams (input stream)

Complete these steps to view the input streams on an IXP subsystem.

1. Select **Sites > IXP subsystem**.
2. Right-click on the **IXP subsystem (or a server on the subsystem)**.
3. Select **Streams**.



Stream	Type	Server Host Name	Client host name	Bytes	Records	First data
ixp5001BulkMonito	KDR	ixp5001-1a	ixp5001-1a	776	5	03/11/2008 18:12:00
ixp5001StreamMoni	KDR	ixp5001-1a	ixp5001-1a	492	5	03/11/2008 18:12:00
ixp5001StoreMonit	KDR	ixp5001-1a	ixp5001-1a	1344	8	03/11/2008 18:12:00
B_rnlck_session_6	KDR	ixp5001-1d	ixp5001-1d	115820698	579011	03/11/2008 17:23:34
B_dis_session_5	KDR	ixp5001-1b	ixp5001-1b	0	0	N/A

**Figure 74 : Streams Monitoring Screen**

Field	Description
Stream	Name of the stream with status icon: <ul style="list-style-type: none"> <li>• Blue - if the stream is present in CCM but not in the IXP monitoring session</li> <li>• Green - if the stream is present in CCM and also session is present in IXP</li> </ul>



<b>Last Update</b>	Date and time of last update from the present processing with this status calculation: <ul style="list-style-type: none"> <li>• Red - if First Data is available and Last Update time of monitoring record is older than 5 minutes from the current time</li> <li>• Yellow - If the First Data is available and Last Update time of monitoring record is older than 2 minutes from current time</li> <li>• Green - If First Data is available and Last Update time is less than 2 minutes</li> </ul>
<b>Type</b>	Type of the stream it can either be XDR or PDU.
<b>Server Host Name</b>	Name of the IXP server which is producer of this stream
<b>Client Host Name</b>	Name of the IXP server which is consumer of this stream
<b>Bytes</b>	Total number of bytes transmitted
<b>Records</b>	Total number of record transmitted
<b>First Data</b>	Timestamp of the first record transmitted for the period of measure

**Table 21 : IXP Streams Monitoring Screen**

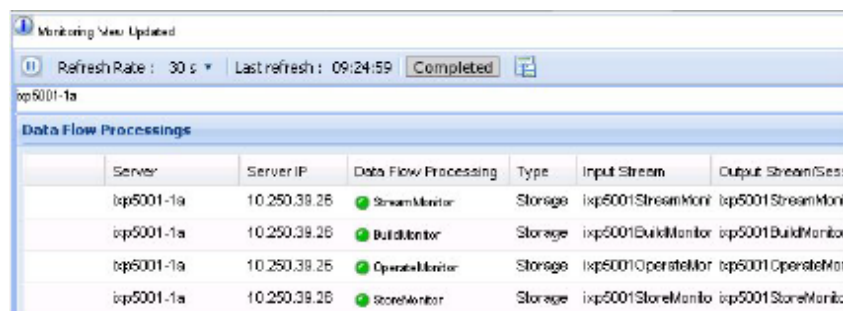
From this screen you can view all the parameters listed in IXP overview screen.

## Dataflow Processing

*Diagnostic Utility* right-click menu enables you view *Dataflow processing* information on that subsystem or a server on that subsystem. Complete these steps to view the dataflow processing on an IXP subsystem.

1. Select **Sites > IXP subsystem**.
2. Right-click on the **IXP subsystem (or a server on the subsystem)**.
3. Select **Dataflow Processing**.

The *Dataflow processing* screen opens shown in the figure below.



Monitoring View Updated						
Refresh Rate : 30 s   Last refresh : 09:24:59   Completed						
ixp5001-1a						
Data Flow Processings						
	Server	Server IP	Data Flow Processing	Type	Input Stream	Output Stream/Session
	ixp5001-1a	10.250.38.26	StreamMonitor	Storage	ixp5001StreamMonit	ixp5001StreamMonit
	ixp5001-1a	10.250.38.26	BulkMonitor	Storage	ixp5001BulkMonitor	ixp5001BulkMonitor
	ixp5001-1a	10.250.38.26	OperateMonitor	Storage	ixp5001OperateMon	ixp5001OperateMon
	ixp5001-1a	10.250.38.26	StoreMonitor	Storage	ixp5001StoreMonito	ixp5001StoreMonito

**Figure 75 : Data Flow Processing Screen**

From this screen you can view and sort any of the parameters described in the table below.

**Note:** You can navigate back to a previous screen by selecting a link on the "railway" located above the title bar.

Parameter	Description
<b>Subsystem+Server</b>	Name of the subsystem and server running the data flow process
<b>Address</b>	Shows the IP address of server where process is running
<b>Data Flow Processing Name and Status</b>	Name of the data flow processing Status indicators indicate if process is running: <ul style="list-style-type: none"> <li>• green - process is running</li> <li>• red - process is not running</li> <li>• blue - process is present in CCM but not in IXP</li> </ul>
<b>Type</b>	Type of Data Flow Processing: <ul style="list-style-type: none"> <li>• building</li> <li>• operation</li> </ul>
<b>Input Stream</b>	Name of the stream where the data flow process is acquiring data
<b>Output Streams/Sessions</b>	Name of the stream where the data flow process is outputting data

**Table 22 : IXP Dataflow Processing Summary**

## Hardware counters

*Diagnostic Utility* right-click menu enables you to view Hardware counter information on a subsystem or server. The information is identical for both IXP and xMF and is described later in this chapter (see About Hardware Counters).

## Sessions

*Diagnostic Utility* right-click menu enables you view *Sessions* information on that subsystem or a server on that subsystem. Complete these steps to view the session information on an IXP subsystem.

The session monitoring task is different from other IXP monitoring tasks in that it uses current information and not historical information.

1. Select **Sites (or Servers) > IXP subsystem**.
2. Right-click on the **IXP subsystem (or a server on the subsystem)**.
3. Select **Sessions**.

The Sessions table opens shown in the figure.


Monitoring View Updated				
Ok				
Ixp Session				
		Name	Protocol	Type
<input type="checkbox"/>		<u>POOL ISUP_PERF1</u>	ISUP ETSI	RECONSTITUTION
<input type="checkbox"/>		<u>POOL ISUP_PERF2</u>	ISUP ETSI	RECONSTITUTION
<input type="checkbox"/>		<u>CCM SIP_CDRS</u>	VoIP SIP	RECONSTITUTION
<input type="checkbox"/>		<u>ixp0888AggSessionMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>		<u>ixp0888PoolMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>		<u>Test Ptq Session</u>	N/A	STATISTICS
<input type="checkbox"/>		<u>PERF2ArchiveTestSU</u>	ISUP ETSI	RECONSTITUTION
<input type="checkbox"/>		<u>ixp0888StreamMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>		<u>ixp0888BuildMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>		<u>ixp0888OperateMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>		<u>ixp0888StoreMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>		<u>CCM BICC_ANSI_CDRS</u>	BICC ANSI	RECONSTITUTION
<input type="checkbox"/>		<u>CCM ISUP_ETSI_CDRS</u>	ISUP ETSI	RECONSTITUTION

Figure 76 : Session Screen

From this screen you can:

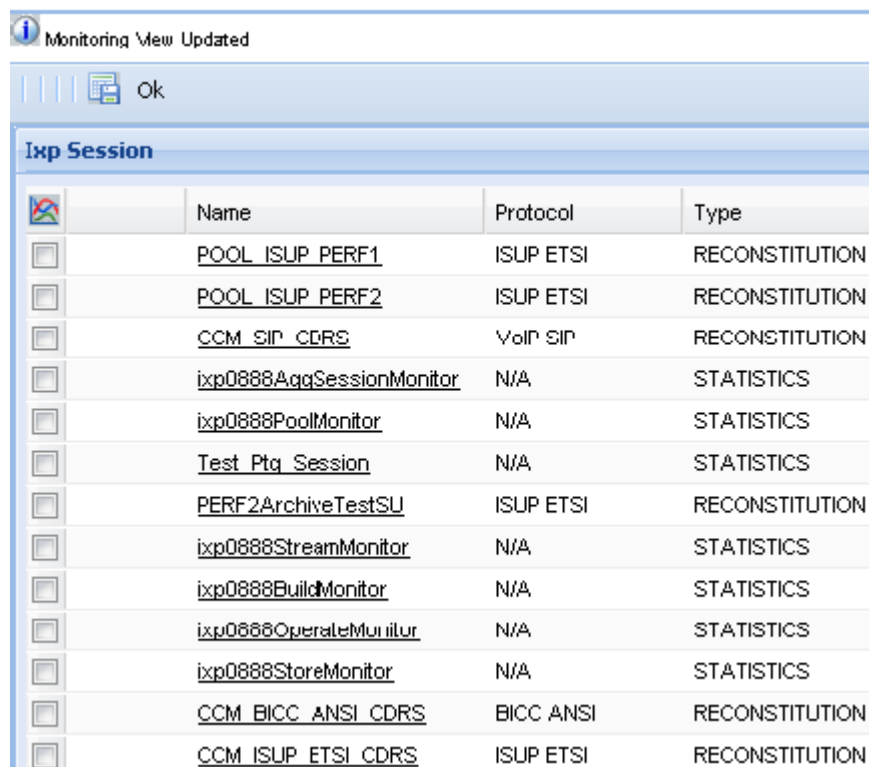
- Sort Sessions in ascending or descending order or view specific columns
- Select sessions for export using the export icon in the tool bar (in csv file format)
- View a sessions by clicking on the session name

Parameter	Description
<b>Name</b>	Name of the session.
<b>Protocol</b>	Shows the protocol (ISUP, BICC, etc) of the session
<b>Type</b>	Type of xDR session: <ul style="list-style-type: none"> <li>• reconstitution</li> <li>• capture</li> <li>• statistics</li> </ul>

**Table 23 : IXP Session Summary**

### Viewing a specific session

From the sessions table, you can view a specific xDR session by clicking on the **Name** of the session. The specific session information is shown.



Monitoring View Updated			
Ok			
Ixp Session			
	Name	Protocol	Type
<input type="checkbox"/>	<u>POOL ISUP PERF1</u>	ISUP ETSI	RECONSTITUTION
<input type="checkbox"/>	<u>POOL ISUP PERF2</u>	ISUP ETSI	RECONSTITUTION
<input type="checkbox"/>	<u>CCM SIP CDRS</u>	VoIP SIP	RECONSTITUTION
<input type="checkbox"/>	<u>ixp0888AggSessionMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>	<u>ixp0888PoolMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>	<u>Test Ptg Session</u>	N/A	STATISTICS
<input type="checkbox"/>	<u>PERF2ArchiveTestSU</u>	ISUP ETSI	RECONSTITUTION
<input type="checkbox"/>	<u>ixp0888StreamMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>	<u>ixp0888BuildMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>	<u>ixp0888OperateMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>	<u>ixp0888StoreMonitor</u>	N/A	STATISTICS
<input type="checkbox"/>	<u>CCM BICC ANSI CDRS</u>	BICC ANSI	RECONSTITUTION
<input type="checkbox"/>	<u>CCM ISUP ETSI CDRS</u>	ISUP ETSI	RECONSTITUTION

**Figure 77 : Session Screen**

The information is described in the table.

Parameter	Description
Name	Name of the session
Protocol	Shows the protocol (ISUP, BICC, etc) of the session
Type	Type of xDR session: <ul style="list-style-type: none"><li>• reconstitution</li><li>• capture</li><li>• statistics</li></ul>
Streams	Input streams connected to the session
Approximate old xDR Count	Approximate number of xDRs in the session until the previous day. This in addition to the current xDR count gives an approximation of the total number of xDRs in the session
First Date	Date of the first xDR available in the session
Last Date	Date of the most recent xDR present in the session
Current xDR Count	Total number of xDRs in the session for the current day

**Table 24 : IXP Session Summary**

## Store

*Diagnostic Utility* right-click menu enables you view Storage information on that subsystem or a server on that subsystem. Complete these steps to view the storage information on an IXP subsystem.

The storage pool monitoring task is different from other IXP monitoring tasks in that it uses current information and not historical information.

1. Select **Sites (or Servers) > IXP subsystem**.
2. Right-click on the **IXP subsystem (or a storage pool server on the subsystem)**.
3. Select **Storage**.

The Storage table opens.

Monitoring View Updated

Refresh Rate: 30 s    Last refresh: 12:05:44    Completed

ixp0888

**IXP Storage Pool**

Pool	DFP Name + Status	Type	Input Stream
ixp0888_Pool	● <u>S_CCM_SIP_CDRS</u>	Storage	B_CCM_SIP_CDRS_98,
ixp0888_Pool	● <u>PoolMonitor</u>	Storage	O_ixp0888PoolMonitor_88,
ixp0888_Pool	● <u>S_ixp0888AppSessionMonitor_91</u>	Storage	K_ixp0888AppSessionMonitor_90
ixp0888_Pool	● <u>StreamMonitor</u>	Storage	ixp0888StreamMonitor,
ixp0888_Pool	● <u>BuildMonitor</u>	Storage	ixp0888BuildMonitor,
ixp0888_Pool	● <u>OperateMonitor</u>	Storage	ixp0888OperateMonitor,
ixp0888_Pool	● <u>StoreMonitor</u>	Storage	ixp0888StoreMonitor,
ixp0888_Pool	● <u>S_POOL_ISUP_PERF1</u>	Storage	O_POOL_ISUP_PERF1_111,
ixp0888_Pool	● <u>S_POOL_ISUP_PERF2</u>	Storage	B_POOL_ISUP_PERF2_6,
ixp0888_Pool	● <u>S_CCM_BICC_ANSI_CDRS</u>	Storage	B_CCM_BICC_ANSI_CDRS_97,
ixp0888_Pool	● <u>S_CCM_ISUP_ETSI_CDRS</u>	Storage	B_CCM_ISUP_ETSI_CDRS_99,

**Figure 78 : Storage Screen**

From this screen you can view and sort any of the parameters described in the table.

Parameter	Description
Pool	Name of the storage pool
DFP Name & Status	Name of the store process Status icon indicates the following states: <ul style="list-style-type: none"> <li>Green - process is in UP</li> <li>Red - process is in some other state</li> <li>Blue - Process is present in CCM but not in IXP</li> </ul>
Type	Storage
Input Stream	Shows the name of the stream that the data flow process is acquiring data from

**Table 25 : IXP Storage Summary**

## Hardware Counters

*Diagnostic Utility* right-click menu enables you view hardware parameters for the server, network and storage disc. Complete these steps to view the hardware counters on an IXP subsystem or server.

1. Select **Sites (or Servers) > IXP subsystem**.
2. Right-click on the **IXP subsystem (or a server on the subsystem)**.
3. Select **Hardware Counters**.

The Hardware counters table opens.

<div> <span>Refresh Rate : 30 s</span> <span>Last refresh : 04:26:38</span> <span>Completed</span> </div>											
<b>Server Parameters</b>											
Server/Subsystem Name	Period end	Type	CPU User	CPU System	Free Physical M	Total Physical M	Available Physi	Free Virtual Me	Total Virtual Me	Available Virtua	
ixp1075-1a/ixp1075_Pool	04/23/2012 13:54:44	IXP	58.7	10.1	60	7986	0	8132	8191	99	
<b>Ethernet Parameters</b>											
Server/Subsystem Name	Interface name	Period end	IP address	Type	Octets received	Octets sent	Bandwidth	Queue			
ixp1075-1a/ixp1075_Pool	eth01	04/21/2012 04:18:52	10.31.1.114	IXP	68616266	135371074	11435	1000			
ixp1075-1a/ixp1075_Pool	eth02	04/21/2012 04:18:52	null	IXP	0	0	0	1000			
ixp1075-1a/ixp1075_Pool	lo	04/21/2012 04:18:52	127.0.0.1	IXP	116271988	116271988	10715	0			
ixp1075-1a/ixp1075_Pool	sit0	04/21/2012 04:18:52	null	IXP	0	0	0	0			
<b>Disk Parameters</b>											
Server/Subsystem Name	Period end	Partition	Type	Disk Writing	Disk Reading	Octet Written	Octets Read	Queue For Writing	Queue For		
ixp1075-1a/ixp1075_Pool	04/21/2012 04:18:38	/dev/cciss/c0d0	IXP	0.43	0	5.85	0	1.43	0		
ixp1075-1a/ixp1075_Pool	04/21/2012 04:18:38	/dev/cciss/c0d1	IXP	0.2	0	6.39	0	0.07	0		
ixp1075-1a/ixp1075_Pool	04/21/2012 04:18:38	/dev/cciss/c1d0p1	IXP	12.47	0.5	0	0	15.5	0		
ixp1075-1a/ixp1075_Pool	04/21/2012 04:18:38	/dev/mapper/vgroot	IXP	6.57	0.5	28.88	2.66	0	0		
ixp1075-1a/ixp1075_Pool	04/21/2012 04:18:38	/dev/mapper/vgroot	IXP	4.83	0	19.16	0	0	0		
ixp1075-1a/ixp1075_Pool	04/21/2012 04:18:38	/dev/mapper/vgroot	IXP	5.63	0	22.75	0	0	0		

**Figure 79 : Hardware Counters Screen**

From this screen you can view and sort any of the parameters described in the table.

Parameter	Description
Pool	Name of the storage pool
DFP Name & Status	Name of the store process Status icon indicates the following states: <ul style="list-style-type: none"> <li>• Green - process is in UP</li> <li>Red - process is in some other state</li> <li>• Blue - Process is present in CCM but not in IXP</li> </ul>
Type	Storage
Input Stream	Shows the name of the stream that the data flow process is acquiring data from

**Table 26 : Hardware Counters Summary**

## Dataflow Processing Drill-down Procedures

From the *Dataflow processing* screen you can begin to *drill down* to view details on specific processes. You can use the drill-down option for each of the dataflow processing types.

- Storage dataflow processings (for IXP storage pool servers)
- Building dataflow processings
- Operating dataflow processings

## Storage Dataflow Processing Drill-down Function

Select the **Name** of the storage data flow process from the list.

The *Storage* screen opens shown in the figure below



Monitoring View Updated

Refresh Rate : 30 s Last refresh : 09:28:45 Paused

ixp5001-1a > BuildMonitor

**Storage**

DFP NAME	DWH Name	Last Update	Session	Received XDR/K	Stored
BuildMonitor	10.250.39.26:152	03/11/2008 13:00:01	ixp5001BuildMo	10	5
BuildMonitor	10.250.39.26:152	03/11/2008 13:01:01	ixp5001BuildMo	10	15
BuildMonitor	10.250.39.26:152	03/11/2008 13:02:01	ixp5001BuildMo	10	5
BuildMonitor	10.250.39.26:152	03/11/2008 13:03:01	ixp5001BuildMo	10	10
BuildMonitor	10.250.39.26:152	03/11/2008 13:04:01	ixp5001BuildMo	10	15
BuildMonitor	10.250.39.26:152	03/11/2008 13:05:01	ixp5001BuildMo	10	5
BuildMonitor	10.250.39.26:152	03/11/2008 13:06:01	ixp5001BuildMo	10	10
BuildMonitor	10.250.39.26:152	03/11/2008 13:07:01	ixp5001BuildMo	10	10
BuildMonitor	10.250.39.26:152	03/11/2008 13:08:01	ixp5001BuildMo	10	10
BuildMonitor	10.250.39.26:152	03/11/2008 13:09:01	ixp5001BuildMo	10	10
BuildMonitor	10.250.39.26:152	03/11/2008 13:10:01	ixp5001BuildMo	10	15
BuildMonitor	10.250.39.26:152	03/11/2008 13:11:01	ixp5001BuildMo	10	5
BuildMonitor	10.250.39.26:152	03/11/2008 13:12:01	ixp5001BuildMo	10	10
BuildMonitor	10.250.39.26:152	03/11/2008 13:13:01	ixp5001BuildMo	10	10
BuildMonitor	10.250.39.26:152	03/11/2008 13:14:01	ixp5001BuildMo	10	10

**Figure 80 : Storage Dataflow Processing Screen**

Field	Description
<b>DFP Name</b>	Shows name of the dataflow processing to which the process belongs
<b>DWH Name</b>	Data warehouse where xDRs are incorporated by this process
<b>Last Update</b>	Date and time (as default) of last update from this processing
<b>Session</b>	Name of the session in which xDR/KPI will be store.
<b>Received xDR/KPIs</b>	Last Value of xDR/KPI count which is received by process.
<b>Stored xDR/KPIs</b>	Last Value of total number of xDR/KPI count stored for this process
<b>Rejected Records</b>	Last Value of xDR/KPI count rejected by this process.

## Operate Dataflow Processing Drill-down Procedure

Select the **Name** of the operate data flow process from the list. The Operate screen opens shown in the figure below.

Monitoring View Updated

Refresh Rate : 30 s Last refresh : 10:06:57 Paused

p0777 > ANSI\_ISUP\_CDRS

Operation						
Server	Name	Last Update	Received XDR	xDRs Enriched	Created KPI	Filtered XDRs
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:11	4613	0	4	4613
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:12	4947	0	4	4947
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:13	4464	0	4	4464
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:14	4702	0	4	4702
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:15	4579	0	4	4579
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:16	4756	0	4	4756
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:17	4550	0	4	4550
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:18	4631	0	4	4631
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:19	4832	0	4	4832
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:20	4518	0	4	4518
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:21	4544	0	4	4544
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:22	4642	0	4	4642
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:23	4870	0	4	4870
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:24	4664	0	4	4664
bp0777-1b	ANSI_ISUP_CDRS	01/11/2008 11:25	4497	0	4	4497

**Figure 81 : Operate Dataflow Processing Screen**

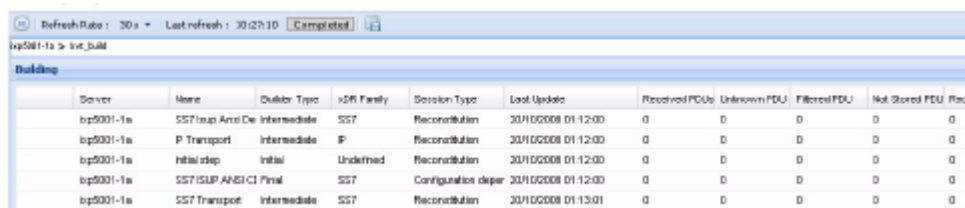
Field	Description
Server Name	Name of the server to which the process belongs
Last Update	Date and time (as default) of last update from this processing
xDRs enriched	Number of xDR getting at least one field enriched
Received xDR	Last Value of xDR/KPI count which is received by process.
Created KPIs	Last Value of total number of KPIs created by this process
Filtered xDRs	Last Value of xDR count passing the corner filter.

**Table 27 : IXP Operate DFP**

## Build Dataflow Processing Drill-down Procedure

1. Select the Name of the build data flow process from the list. The

Build screen opens shown in the figure below.



The screenshot shows a web interface with a 'Building' section. It contains a table with columns: Server, Name, Builder Type, xDR Family, Session Type, Last Update, Received PDUs, Unknown PDU, Filtered PDU, Not Stored PDU, and Floor. The table lists several build data flow processes for server 'bp5001-1a'.

Server	Name	Builder Type	xDR Family	Session Type	Last Update	Received PDUs	Unknown PDU	Filtered PDU	Not Stored PDU	Floor
bp5001-1a	SS7 (sup ANCI) De	Intermediate	SS7	Reconstitution	30/10/2008 01:12:00	0	0	0	0	0
bp5001-1a	P Transport	Intermediate	IP	Reconstitution	30/10/2008 01:12:00	0	0	0	0	0
bp5001-1a	Initial step	Initial	Undefined	Reconstitution	30/10/2008 01:12:00	0	0	0	0	0
bp5001-1a	SS7 (SUP ANCI) Final	Final	SS7	Configuration deper	30/10/2008 01:12:00	0	0	0	0	0
bp5001-1a	SS7 Transport	Intermediate	SS7	Reconstitution	30/10/2008 01:13:01	0	0	0	0	0

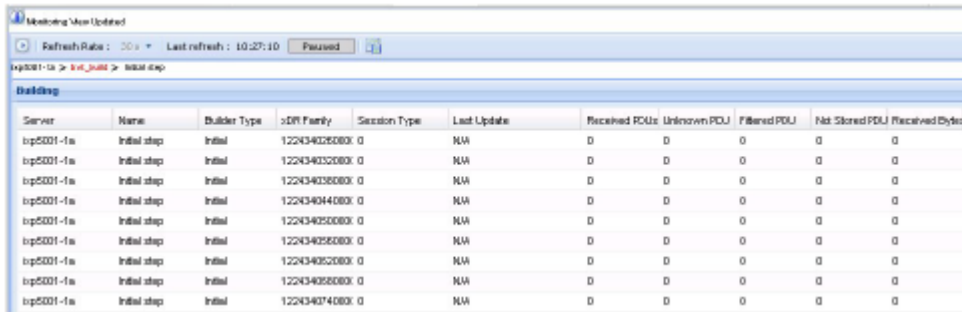
Figure 82 : Build Dataflow Processing Screen

Field	Description
Server	Name of the server
Builder name	Name of the xDR builder
xDR builder type	One of - <ul style="list-style-type: none"> <li>• 1 initial</li> <li>• 2 intermediate</li> <li>• 3 final</li> <li>• 4 unified</li> </ul>
xDR family	One of - <ul style="list-style-type: none"> <li>• 1 GPRS</li> <li>• 2 GPRS or SS7</li> <li>• 3 SS7</li> <li>• 4 IP, 5 undefined</li> <li>• 6 VoIP, 7 VoIP or GPRS</li> <li>• 8 UMTS</li> </ul>
Session Type	<ul style="list-style-type: none"> <li>• 1 reconstitution</li> <li>• 2 capture</li> <li>• 3 configurable</li> <li>• 4 KPI</li> <li>• 5 other statistics</li> </ul>
Last Update	Date and time (as default) of last update from this processing
Received PDUs	Last Value of PDU count submitted to the builder
Unknown PDU	Count of PDU which are not of the correct type. For instance, an IP frame in SS7 transport
Filtered PDU	PDUs rejected due to filtering conditions. This can be an explicit condition like a port number, or implicit like SIO=5 for ISUP.

<b>Not Stored PDU</b>	Count of PDUs not stored. The reasons for not storing could be in the xDR builder configuration, general parameter "Store PDUs" not set, no space left on disk, writing not allowed on all PDU disks, wrong disk sharing or mounting.
<b>Received Bytes</b>	Last Value of total number of bytes received (including PDU headers)
<b>Generated XDRs</b>	Last Value of produced xDR count
<b>Valid xDRs</b>	Last Value of xDR that could be correlated without suspicion of error.
<b>xDRs Not Transmitted</b>	xDRs that could not be transmitted to the consumer (for instance - operate, store)
<b>Generated Bytes</b>	Last Value of total number of bytes sent to a session, xDR record and variable parts.

**Table 28 : IXP Build Process Table**

- To view the detail of an individual build process, click the **Name** of the process in the *Summary* screen.  
The detail screen opens.



The screenshot shows a web interface titled "Monitoring View Updated". Below the title bar, there are controls for "Refresh Rate" (set to 30s) and "Last refresh" (10:27:10). A breadcrumb trail indicates the path: "ixp5001-1a > ixt\_build > initial step". The main content area is titled "Building" and contains a table with the following columns: Server, Name, Builder Type, xDR Family, Session Type, Last Update, Received PDU, Unknown PDU, Filtered PDU, Not Stored PDU, and Received Bytes. The table lists ten rows of data for the server "ixp5001-1a", all with "Initial step" as the name and "Initial" as the builder type. The xDR Family values are 122434026000, 122434032000, 122434038000, 122434044000, 122434050000, 122434056000, 122434062000, 122434068000, 122434074000, and 122434080000. The Last Update values are all "N/A". The Received PDU, Unknown PDU, Filtered PDU, and Not Stored PDU values are all "0". The Received Bytes values are all "0".

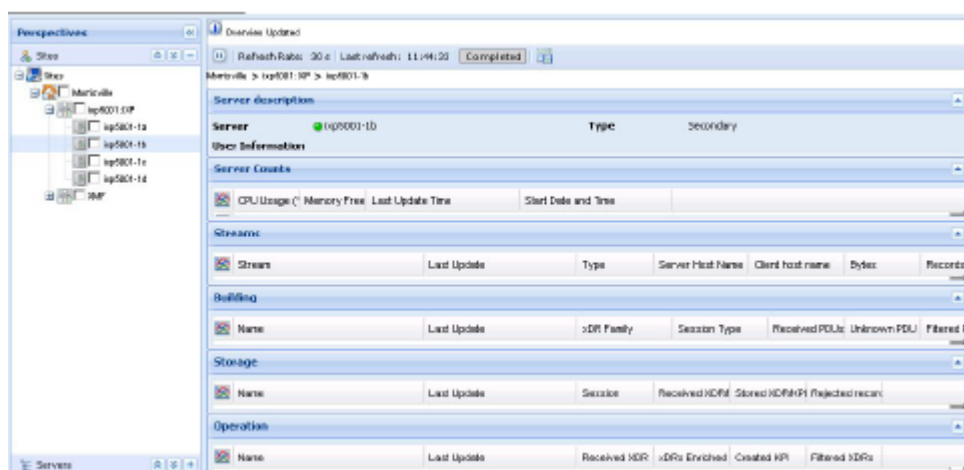
Server	Name	Builder Type	xDR Family	Session Type	Last Update	Received PDU	Unknown PDU	Filtered PDU	Not Stored PDU	Received Bytes
ixp5001-1a	Initial step	Initial	122434026000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434032000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434038000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434044000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434050000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434056000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434062000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434068000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434074000	0	N/A	0	0	0	0	0
ixp5001-1a	Initial step	Initial	122434080000	0	N/A	0	0	0	0	0

**Figure 83 : Build Dataflow Processing Detail Screen**

## Monitoring Specific IXP Servers within an IXP Subsystem

You can display an overview of one selected IXP server. Complete these steps to select and monitor a specific IXP server. Select **Sites Perspective** to expand it.

- Expand **Site > IXP subsystem**.
- Select the **IXP server** to be viewed.



The *table* screen opens shown in the figure below.

**Figure 84 : Specific IXP Server Monitoring**

The information provided to you is the same as that provided at the subsystem level except that it is for the specific server.

## Monitoring xMF Subsystems and Servers

**Note:** You can monitor subsystems and servers from either the *Sites* or *Server perspective*.

*Diagnostic Utility* enables you to monitor specific parameters on subsystems and servers.

You open the subsystem by either selecting it from the object menu or drilling down from the site overview table.

## Monitoring xMF Subsystems

You can view all of the xMF (IMF and PMF) subsystems by selecting the **xMF** root in the *Server perspective*.



**Figure 85 : xMF Root Overview Screen**

The table provides the following counters:

Parameter	Description
<b>Subsystem Name + Subsystem status</b>	Name of the subsystem and Status of the subsystem is calculated as follows: <ul style="list-style-type: none"> <li>• Green - Status of all the servers in the subsystem is green</li> <li>• Yellow - Status of some of the servers in the subsystem is not green</li> <li>• Red - Status of all the servers in the subsystem is red</li> </ul>
<b>In Throughput (kbps)</b>	Sum of input throughputs of servers in this subsystem in kilobits per second
<b>Out Throughput (kbps)</b>	Sum of output throughputs of servers in this subsystem in kilobits per second
<b>User Information</b>	Information about the subsystem

**Table 29 : XMF Subsystem Overview**

## Viewing a Specific xMF Subsystem

Complete these steps to view a specific xMF subsystem.

Click on the **xMF subsystem** (either IMF or PMF) that you want to monitor.

The *Subsystem monitoring* screen opens shown in the figure below.

**Note:** xMF subsystem selection can be made on the root overview in the site overview screen or on the object tree in the *Sites* or *Servers* perspective

**Figure 86 : xMF Subsystem Monitoring (PMF shown)**

Server	Failure	Role	Location	Monitoring On	Assign	Heart Beat Time	CPU U%	In Throughput	Out Throughput	RDU In Speed	RDU Out Speed	Inet Sync	Inet Merge	L
img-00	IS	AdMaster	QA	N/A	D	1610.0000 07:07:30	0	112	433	433	525	Active	Active	

From this screen you can monitor the following xMFServer *Counts* and Destination *counts* described in the tables below;

Parameter	Description
<b>Server Name + Server status*</b>	<p>Provides the name of the xMF server</p> <p>Status of the server is calculated as follows:</p> <ul style="list-style-type: none"> <li>• Green - all next points are true: all destinations have green status all IP interfaces have green status or all IP interfaces have gray status (if available) all Level 1 interfaces have green status (if available) InetSync and InetMerge statuses of the server are green Last Update time of the server has green status Failover state is In Service Heart Beat time of the server has green status</li> <li>• Yellow - InetSync and InetMerge statuses of the server are green, Failover Status is In Service and at least one of the next points is true: • not all destinations are green and not all destinations are red • not all IP interfaces are green and not all IP interfaces are gray and not all IP interfaces are red (if available) not all Level 1 interfaces are green and not all Level 1 interfaces are red (if available) Last Update time of the server has yellow status and all destination are not red and all IP or Level 1 interfaces are not red Heart Beat time of the server has yellow status and all destination are not red and all IP or Level 1 interfaces are not red</li> <li>• Red - at least one of the next points is true: • all destinations have red status • all IP or Level 1 interfaces have red status • InetSync/Merge status of the server is red Failover state is Out Of Service</li> </ul>
<b>Failover Status</b>	<p>Failover state of Server:</p> <ul style="list-style-type: none"> <li>• Green - failover state is IS (In service)</li> <li>• Red - failover state is OOS (Out of service)</li> </ul>
<b>Role*</b>	Role of the server in subsystem - ActiveMaster/StandbyMaster/Slave
<b>Location*</b>	Location of the server in the frame.
<b>Monitoring Group*</b>	Name of the link group assigned to this server or N/A when no group is assigned
<b>Assignment*</b>	The number of links monitored by the server.

<b>Heart Beat (HB) Time</b>	The time stamp (date and time as default) of the last heart beat ping. Status of Heart Beat Time is calculated as follows: <ul style="list-style-type: none"> <li>• Green - heart beat time is less than 1 min old</li> <li>• Yellow - heart beat time is more than 1 and less than 2 minutes old</li> <li>• Red - last update time is more than 2 minutes old</li> </ul>
<b>CPU Usage (%)</b>	Percentage of CPU being used currently
<b>In Throughput (kbps)</b>	Input throughput in kilobits per second
<b>Out Throughput (kbps)</b>	Output throughput in kilobits per second
<b>PDU Out Speed (#/s)</b>	Number of PDUs (MSUs) transmitted from xMF per second. It can be average value from last n seconds, depends on xMF setting
<b>PDU In Speed (#/s)</b>	Average speed of MSU input per second. It can be average value from last n seconds, depends of xMF setting
<b>Inet Sync + Inet Sync status icon</b>	The actual state of the InetSync connections of this server to other servers in subsystem and A-node. (The working states are Active/StandBy, other states show the connection has some problem - Down, DownListening, DownConnecting, DownRejected, DownHandshake, Connected, ConnectedReinit, ConnectedIncompat, RegisterSent, RegisterAcked, Inhibited, AuditWait, AuditQueue, Audit, ActiveBehind, ActiveSwitch, ActivePostAudit) Status of the InetSync is calculated as follows: <ul style="list-style-type: none"> <li>• Green - InetSync connections with other servers in subsystem and A-node are operable (Active or StandBy)</li> <li>• Red - InetSync connection to at least one server in subsystem or A-node is not operable (state is other than Active or StandBy)</li> </ul>
<b>Inet Merge + Inet Merge status icon</b>	The actual state of the InetMerge connection from A-node (The working state is Active, other states says the connection has some problem - Down, DownListening, DownConnecting, DownRejected, DownHandshake, Connected, ConnectedReinit, ConnectedIncompat, RegisterSent, RegisterAcked, Inhibited, AuditWait, AuditQueue, Audit, ActiveBehind, ActiveSwitch, ActivePostAudit) Status of the InetMerge is calculated as follows: <ul style="list-style-type: none"> <li>• Green - InetSync connections with other servers in subsystem and A-node are operable (Active or StandBy)</li> <li>• Red - InetSync connection to at least one server in subsystem or A-node is not operable (state is other than Active or StandBy)</li> </ul>
<b>Last Update Time + Last Update Time status icon</b>	Date and time (as default) of last update of server counts in database. Status of Last Update Time is calculated as follows: <ul style="list-style-type: none"> <li>• Green - last update time is less than or equal to 2 min</li> <li>• Yellow - last update time is greater than 2 min</li> </ul>

**Table 30 : Server Counts Table**

\* denotes that these parameters are viewed only at the subsystem level.



Server	Destination	Type	State	Last Processed Time	PDU Transmitted	PDU Failed	PDU Speed (#/s)	Congestion	Last State Change
gardenia-6a	TCP_GARDENIA_001	DTS	A	15/10/2006 07:30:39	634706	0	70		15/10/2006 06:44:12

**Figure 87 : xMF Destination Counts –IMF Shown**

#### xMF Destinations Parameter Descriptions

Parameter	Description
<b>Server name*</b>	Name of destination xMF server
<b>Destination name + Destination status</b>	Name of the destination. Status of the destination is calculated as follows: Green - link has Green A status and no congestion and Last Processed Time status is green Yellow - link has Green A status and it is in congestion or Last Processed Time status is yellow Red - link has other status than green A or Last Processed Time status is red
<b>Destination Type</b>	Type of the destination. Either DST or MFP
<b>Destination State</b>	Link State value of destination: <b>Green - A (in service)</b> <b>Red - OS (out of service)</b>
<b>Last Processed Time + Last Processed Time status</b>	Time of Last Processed PDU (MSU) of the destination. Date and time (as default) of Last Processed Time is calculated as follows: • Green - last sync time is less or equal to 2 min old • Yellow - last sync time is more than 2 minutes old NOTE - If no PDU is transmitted currently (PDU Speed = 0), then the Last Processed Time status will be Green
<b>PDU Transmitted</b>	Number of PDUs (MSUs) transmitted from the xMF server to the destination
<b>PDU Failed</b>	Number of failed PDU (MSU) transmissions from the xMF server to the destination
<b>PDU Speed (#/s)</b>	Number of PDUs (MSUs) transmitted from xMF per second It can be average value from last n seconds, depends on xMF setting.

<b>Congestion + Congestion status icon</b>	Connection congested status - YES or NO Status of Congestion is calculated as follows: Green - congestion is NO Red - congestion is YES
<b>Last State Change</b>	Data and time (as default) of last change of Link State

\* denotes that these parameters are viewed only at the subsystem level.

#### SigTran Filter Counters

Counter	Description
<b>Server Name</b>	The name of the server that houses the sigtran process
<b>Last Update and Status</b>	Data and time of the last update. Status of server is calculated as follows: <ul style="list-style-type: none"> <li>• Green difference between last update time and current time is less or equal to 2 minutes</li> <li>• Yellow - difference between last update time and current time is greater than 2 minutes.</li> </ul>
<b>Current reassembly failure</b>	Total number of chunk reassembly failures
<b>IP reassembly failure</b>	Total number of IP reassembly failures
<b>IP fragmented packet</b>	Total number of IP fragmented packets

**Table 31 : Sigtran Filter Counter Descriptions**

# Viewing Specific xMF Servers in an xMF Subsystem

By either selecting the server from the *xMF Overview* screen, or selecting the server from the object tree, you open the *xMF Server Overview* screens.

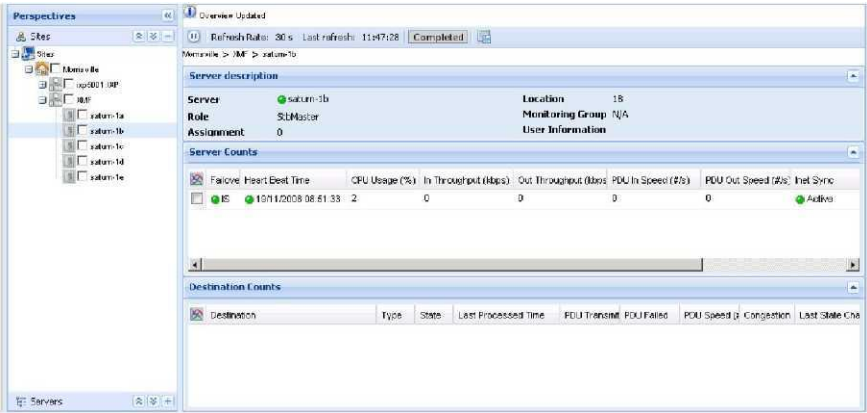


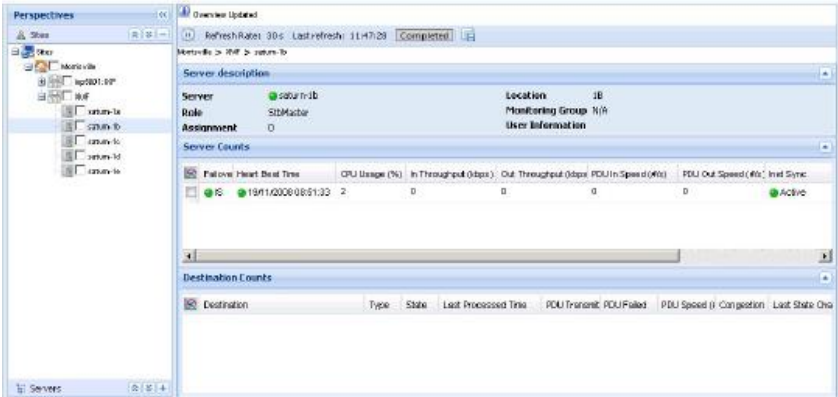
Figure 88 : xMF Subsystem Monitoring -PMF Shown

The information is the same as that provided at the xMF subsystem level except that it is for the specific server selected.

## Server level PMF specific parameters

Described are the PMF specific parameter tables, Level 1 counts and IP counts.

Figure 89 : xMF Server Counts Screen –PMF shown



## Level 1 Counts (PMF)

The level1 counts are for PMF only shown in figure

Name/Type	Slot ID	Sub ID	RAI RX	RAI TX	LFA RX	LFA TX	AIS RX	AIS TX	LOS RX	LOS TX	Frame Avg In	Frame Avg Out
143-0a	3	4	Green	Green	Green	Green	Green	Green	Green	Green	38	63
143-0a	3	5	Green	Green	Green	Green	Green	Green	Green	Green	38	63
143-0a	3	6	Green	Green	Green	Green	Green	Green	Green	Green	38	63
143-0a	3	7	Green	Green	Green	Green	Green	Green	Green	Green	38	63

Figure 90 : PMF Level 1 Counts Overview Table

Table 32 : Xmf Level 1 Counts Overview Table Pmf Only

Field	Description
<b>Name/Type + status icon</b>	Identification of Level 1 interface (name and type) Status of the interface is calculated as follows: <ul style="list-style-type: none"> <li>Green - no alarm occurred</li> <li>Red - at least one alarm occurred</li> </ul>
<b>Slot ID</b>	Slot identification number
<b>Sub ID</b>	Span identification number
<b>RAI RX</b>	Current state of the "Remote Alarm Identification" alarm for RX direction. Red Alarm is raised Green no alarm
<b>RAI TX</b>	Current state of the "Remote Alarm Identification" alarm for TX direction Red- alarm is raised Green no alarm
<b>LFA RX</b>	Current state of the "Loss of Frame Alignment (or LOF)" alarm for RX direction Red- alarm is raised Green no alarm
<b>LFA TX</b>	Current state of the "Loss of Frame Alignment (or LOF)" alarm for TX direction Red- alarm is raised
<b>AIS RX</b>	Current state of the "Alarm identification Signal" alarm for RX direction Red- alarm is raised Green no alarm
<b>AIS TX</b>	Current state of the "Alarm identification Signal" alarm for TX direction Red- alarm is raised Green no alarm
<b>LOS RX</b>	Current state of the "Loss of Signal" alarm for RX direction Red- alarm is raised Green no alarm
<b>LOS TX</b>	Current state of the "Loss of Signal" alarm for TX direction Red- alarm is raised Green no alarm

<b>Frame Avg In</b>	Input average frame rate (messages per second)
<b>Frame Avg Out</b>	Output average frame rate (messages per second)

## IP counts

The IP counts table is available only in PMF.

The screenshot shows a web interface for PMF IP Counts. It includes a 'Server description' section with details for 'gardnia-0a' (Role: Act Master, Location: 0A, Monitoring Group: N/A, User Information). Below this are sections for 'Server Counts', 'Destination Counts', 'Level 3 Counts', and 'IP Counts'. The 'IP Counts' section displays a table with columns: Name/Type, Interface, State, IP Frame Read, IP Frame Drop, IP Packet Rec, Byte Received, LOF Alarm, and NBE Alarm. The table lists two interfaces: 'gardnia-0a\_eth0' (Connected, 0 frames read, 0 frames dropped, 0 packets received, 73362 bytes received, LOF and NBE alarms are green) and 'gardnia-0a\_eth02' (Disconnected, 0 frames read, 0 frames dropped, 0 packets received, 0 bytes received, LOF and NBE alarms are green).

Name/Type	Interface	State	IP Frame Read	IP Frame Drop	IP Packet Rec	Byte Received	LOF Alarm	NBE Alarm
gardnia-0a_eth0	gardnia-0a-eth01	Connected	0	0	0	73362	Green	Green
gardnia-0a_eth0	gardnia-0a-eth02	Disconnected	0	0	0	0	Green	Green

**Figure 91 : PMF IP Counts Overview Table**

Field	Description
<b>Name/Type + IP card status icon</b>	Identification of IP card (name and type) Status of the card is calculated as follows: Green - all card interfaces have Green status • Yellow - at least one, but not all, interface has Red or Gray status • Red - all interfaces have Red status • Gray - all interfaces have Gray status
<b>Interface + interface status icon</b>	Identification of card interface (name and type) Status of the card interface is calculated as follows: • Green - none alarm occurred • Red - at least one alarm occurred • Gray - state is "cable disconnected on the receiving side"
<b>State</b>	State of receiving side - cable connected or disconnected
<b>IP Frame Read OK</b>	Number of IP datagrams read without error
<b>IP Frame Dropped</b>	Number of IP datagrams dropped
<b>IP Packet Received</b>	Total number of input datagrams received from interfaces, including those received in error
<b>Byte Received</b>	Total number of bytes received

<b>LOF Alarm</b>	Current state of the "Ethernet - Loss of Frame" alarm Red- alarm is raised Green no alarm
<b>NIBE Alarm</b>	Current state of the "Ethernet - Network Interface Board Error" alarm Red- alarm is raised Green no alarm
<b>MTU</b>	Maximum Transmission Unit of the network interface.
<b>Speed</b>	Speed of the network interface connection MTU in Mbits/s

Table 33 : Xmf IP Counts Overview Table -Pmf Only

## The xMF Subsystem and Server Right-click Menu

The xMF subsystem is divided into two categories, IMF or PMF. Each xMF type has different functions and thus has different monitoring capabilities. The hierarchy for xMF right click options is the following:

### General xMF monitoring (both IMF and xMF) right-click menu options

- Refresh - refreshes the screen to reflect any changes that have occurred
- Multiple Subsystems Overview - if multiple xMF (IMF and/or PMF) subsystems are selected, this right-click option is operational
- Multiple Servers Overview - if multiple xMF (IMF and/or PMF) servers are selected, this right-click option is operational

### IMF subsystem right-click menu options (IMF)

- Refresh - refreshes the screen to show any changes that have occurred within an xMF (IMF) subsystem and server
- xMF Servers - enables the monitoring of all the xMF (IMF) servers in a subsystem and server
- Destinations - enables the monitoring of the destination counts within the xMF (IMF) subsystem and server
- Hardware Counters - enables of the hardware counts within the xMF subsystem and server
- Reset Destinations Counts (subsystem only) - enables the reset of the destination counts
- Multiple Servers Overview (subsystem only) - if multiple servers on that subsystem are selected, enables monitoring of multiple servers

### IMF server right-click menu options

- xMF Servers - enables the monitoring of the IMF servers selected
- Destinations - enables the monitoring of the destination counts for that IMF server
- Hardware Counters - enables of the hardware counts within that IMF server

### PMF subsystem right-click menu options

- Refresh - refreshes the screen to show any changes that have occurred
- Destinations - enables the monitoring of the destination counts within the PMF subsystem
- Level 1 - enables the monitoring of level 1 counts within the PMF subsystem

- IP devices - enables the monitoring of the IP devices within that subsystem
- Hardware Counters - enables the monitoring of the server, ethernet and disk parameters on all the servers in the subsystem
- Traffic Classification Counters - enables the monitoring of the counts for traffic classifications within a PMF subsystem
- PMIA Filter Counters - enables the monitoring of the counts for PMIA within a PMF subsystem
- Sigtran Filter Counters - enables the monitoring of the sigtran filters within a PMF subsystem
- Multi-Processor NIC Counters - enables the monitoring of Tiler cards within a PMF subsystem
- Reset Input Counts (subsystem only)
- Reset Destinations Counts (subsystem only)
- Reset Level 1 Counts (subsystem only)
- Reset IP Counts (subsystem only)

#### **PMF server right-click menu options**

- xMF Servers -enables the monitoring of the PMF servers selected
- Destinations - enables the monitoring of the destination counts within the PMF server(s) selected
- Level 1 - enables the monitoring of level 1 counts within the PMF server(s)
- IP Devices - enables the monitoring of the IP devices for the server(s) selected
- Hardware Counters - enables of the hardware counts within the PMF server(s) selected
- Traffic Classification Counters - enables the monitoring of the counts for traffic classifications within the PMF server(s) selected
- PMIA Filter Counters - enables the monitoring of the counts for PMIA within the PMF server(s) selected
- Multi-Processor NIC Counters - enables the monitoring of Tiler cards within the PMF server(s) selected

### IMF Server Right-click Menu

The IMF server right-click menu enables you to view specific counters in table form. Each menu option is described.

#### **IMF Server Counts**

This right-click menu enables you to see a listing of each server in the IMF subsystem shown in the figure below.

**Table 34 : IMF Server Counts Description**

Parameters	Description
PDU Transmitted	Number of PDUs (MSUs) transmitted from the xMF server to destinations (e.g. ICP, IXP)
PDU Failed (#)	Number of failed PDU (MSU) transmissions from the xMF server to destinations (e.g. ICP, IXP)
PDU Speed (#/s)	Number of PDUs (MSUs) transmitted from xMF per second. (It can be average value from last n seconds, depending on xMF setting.)
In Throughput (Kbps)	Input throughput in kilobits per second
Out Throughput (Kbps)	Output throughput in kilobits per second
PDU IN	Number of received PDUs (MSUs)

Received (#)	
PDU IN Rejected (#)	Number of rejected PDUs (MSUs)
PDU IN Speed (#)	Average speed of PDU (MSU) input. (It can be average value from last n seconds, depending on xMF setting.)
Last Update Time	Last time the record was updated

### Destination Counts

This right-click option enables you to see a listing of the destination counts in the xMF subsystem shown in the figure below.

Parameter	Description
Server	Name of xMF server (only filled in on )
Destination	Name of the destination (only filled in on destination row)
State	<p>Server row shows the following states:</p> <ul style="list-style-type: none"> <li>• green A if all destinations have green A</li> <li>• yellow A if at least one but not all destinations have other status than green A</li> <li>red OS if none destination has green A</li> </ul> <p>Destination row where the state value of the destination is either:</p> <ul style="list-style-type: none"> <li>• green - A - Destination is In Service</li> <li>• red - OS - Destination is Out of Service</li> </ul>
PDU Transmitted	<p>Destination row - Number of PDUs (MSUs) transmitted from the xMF server to the destination (e.g. ICP, IXP)</p> <p>Server row - Sum of PDU Transmitted values of destination rows on this server</p>
PDU Failed	<p>Destination row - Number of failed PDU (MSU) transmissions from the xMF server to the destination</p> <p>Server row - Sum of PDU Failed values of destination rows on this server</p>
PDU Speed (#/s)	<p>Destination row - Number of PDUs (MSUs) transmitted from xMF server per second. (It can be average value from last n seconds, depends of xMF setting.)</p> <p>Server row - Sum of PDU Speed values of destination rows on this server</p>
Congestion	Connection congested status - YES or NO Status of Congestion is calculated as follows:
Last State Change	<p>Destination row - Data and time of last change of Link State</p> <p>Server row - N/A</p>

**Table 35 : xMF Destination Count Descriptions**

### Hardware Counts



This right-click option enables you to see the hardware parameters in an IMF system

#### IMF Hardware Count Descriptions

Parameter	Description
Server Parameters	For more information, see <b>Hardware Counters</b>
Ethernet Parameters	For more information, see Hardware Counters
Disk Parameters	For more information, see Hardware Counters

#### Reset Destination Counts

**Note:** This option is only available to users assigned to NSPMonitorPowerUser and NSPMonitorManager roles.

Clicking on this menu item opens a pop-up window asking to reset the destination counts, Yes or No. To reset destination counts, click **Yes**. To exit the reset option, click **No**.

#### PMF Right-click Menu

The PMF right-click menu enables you to view specific parameters in table form.

##### PMF Server Counts

This right-click menu enables you to see a listing of each server in the PMF subsystem described in the table.

Table 36 : PMF Server Count Descriptions

Parameters	Description
<b>Server</b>	Name of xMF server
<b>Memory Free (KB)</b>	Number of kilobytes of free memory
<b>CPU Usage (%)</b>	Percentage of CPU being used
<b>Disk Usage (%)</b>	Percentage of disk space being used
<b>PDU Transmitted (#)</b>	Number of PDUs (MSUs) transmitted from the xMF server to destinations (e.g. ICP, IXP)
<b>PDU Failed (#)</b>	Number of failed PDU (MSU) transmissions from the xMF server to destinations (e.g. ICP, IXP)
<b>PDU Speed (#/s)</b>	Number of PDUs (MSUs) transmitted from xMF per second. (It can be average value from last n seconds, depending on xMF setting.)
<b>In Throughput (Kbps)</b>	Input throughput in kilobits per second
<b>Out Throughput (Kbps)</b>	Output throughput in kilobits per second
<b>PDU IN Received</b>	Number of received PDUs (MSUs)
<b>PDU IN Rejected</b>	Number of rejected PDUs (MSUs)
<b>PDU IN Speed (#)</b>	Average speed of PDU (MSU) input. (It can be average value from last n seconds, depending on xMF setting.)
<b>Last Update Time</b>	Last time the record was updated
<b>PDU IN Rejected</b>	Number of rejected PDUs (MSUs)
<b>PDU IN Speed (#)</b>	Average speed of PDU (MSU) input. (It can be average value from last n seconds, depending on xMF setting.)
<b>Last Update Time</b>	Last time the record was updated

## Destination Counts

This right-click option enables you to see a listing of the destination counts in the xMF subsystem shown in the figure below.

Parameter	Description
Server	Name of xMF server (only filled in on )
Destination	Name of the destination (only filled in on destination row)
State	<p>Server row shows the following states:</p> <ul style="list-style-type: none"> <li>green A if all destinations have green A</li> <li>yellow A if at least one but not all destinations have other status than green A</li> <li>red OS if none destination has green A</li> </ul> <p>Destination row where the state value of the destination is either:</p> <ul style="list-style-type: none"> <li>green - A - Destination is In Service</li> <li>red - OS - Destination is Out of Service</li> </ul>
PDU Transmitted	<p>Destination row - Number of PDUs (MSUs) transmitted from the xMF server to the destination (e.g. ICP, IXP)</p> <p>Server row - Sum of PDU Transmitted values of destination rows on this server</p>
PDU Failed	<p>Destination row - Number of failed PDU (MSU) transmissions from the xMF server to the destination</p> <p>Server row - Sum of PDU Failed values of destination rows on this server</p>
PDU Speed (#/s)	<p>Destination row - Number of PDUs (MSUs) transmitted from xMF server per second. (It can be average value from last n seconds, depends of xMF setting.)</p> <p>Server row - Sum of PDU Speed values of destination rows on this server</p>
Congestion	<p>Connection congested status - YES or NO</p> <p>Status of Congestion is calculated as follows:</p> <ul style="list-style-type: none"> <li>Green - congestion is NO</li> <li>Red - congestion is YES</li> </ul>
Last State Change	<p>Destination row - Data and time of last change of Link</p> <p>State Server row - N/A</p>

**Table 37 : xMF Destination Count Descriptions**

### Level 1 Counts (PMF)

The level 1 counts are for PMF only, (shown and described in the figure and table below), are viewed by clicking on either *the Level 1 Counts* title bar or the arrow on the right side of the screen.

**Table 39 : xMF Level 1 (PMF Only) PMF Descriptions**

Parameter	Description
<b>Name/Type + status</b>	Identification of Level 1 interface (name and type) Status of the interface is calculated as follows: <ul style="list-style-type: none"> <li>• Green - no alarm occurred</li> <li>• Red - at least one alarm occurred</li> </ul>
<b>Slot ID</b>	Slot identification number
<b>Sub ID</b>	Interface row - Span identification number Server row - N/A
<b>RAI RX</b>	Current state of the "Remote Alarm Identification" alarm for RX direction; Red means that alarm is raised, Green in other case
<b>RAI RX State</b>	Interface row - Current state of the "Remote alarm identification" alarm for RX direction Server row - Number of currently raised alarms on interfaces on this server
<b>RAI TX</b>	Current state of the "Remote Alarm Identification" alarm for TX direction
<b>RAI TX State</b>	Interface row - Current state of the "Remote alarm identification" alarm for TX direction Server row - Number of currently raised alarms on interfaces on this server <ul style="list-style-type: none"> <li>•Red - alarm is raised</li> <li>•Green - other condition</li> </ul>
<b>LFA RX</b>	Current state of the "Loss of Frame Alignment (or LOF)" alarm for RX direction
<b>LFA RX State</b>	Interface row - Current state of the "Loss of Frame Alignment (or LOF)" alarm for RX direction Server row - Number of currently raised alarms on interfaces on this server
<b>LFA TX</b>	Current state of the "Loss of Frame Alignment (or LOF)" alarm for TX direction <ul style="list-style-type: none"> <li>• Red- alarm is raised</li> <li>• Green no alarm</li> </ul>
<b>LFA TX State</b>	Interface row - Current state of the "Loss of Frame Alignment (or LOF)" alarm for TX direction Server row - Number of currently raised alarms on interfaces on this server

<b>AIS RX</b>	Current state of the "Alarm identification Signal" alarm for RX direction Red- alarm is raised Green no alarm
<b>AIS RX State</b>	Interface row - Current state of the "Alarm identification Signal" alarm for RX direction Server row - Number of currently raised alarms on interfaces on this server
<b>AIS TX</b>	Current state of the "Alarm identification Signal" alarm for TX direction Red- alarm is raised Green no alarm
<b>AIX TX State</b>	Interface row - Current state of the "Alarm identification Signal" alarm for TX direction Server row - Number of currently raised alarms on interfaces on this server
<b>LOS RX</b>	Current state of the "Loss of Signal" alarm for RX direction Red- alarm is raised Green no alarm
<b>LOS RX State</b>	Interface row - Current state of the "Loss of Signal" alarm for RX direction Server row - Number of currently raised alarms on interfaces on this server
<b>LOS TX</b>	Current state of the "Loss of Signal" alarm for TX direction Red- alarm is raised Green no alarm
<b>LOS TX State</b>	Interface row - Current state of the "Loss of Signal" alarm for TX direction Server row - Number of currently raised alarms on interfaces on this server
<b>resetTime</b>	Interface row - Last time the level1 stat were reset Server row - empty
<b>Frame RX</b>	Interface row - Total frames received Server row - Sum of interface values on this server
<b>Frame TX</b>	Interface row - Total frames transmitted Server row - Sum of interface values on this server
<b>Frame Avg Speed RX</b>	Interface row - Input average frame rate (messages per second) Server row - Sum of interface values on this server
<b>Fram Avg Speed TX</b>	Interface row - Output average frame rate (messages per second) Server row - Sum of interface values on this server

## IP Device Counts

The IP counts, (shown and described in the figure and table below), are viewed by clicking on either the *IP Counts* title bar or the arrow on the right side of the screen.

**Table 40 :xMF IP Device Monitoring Parameters**

Parameter	Description
<b>Name</b>	Interface row - Identification of IP device's interface Device row - Identification of IP device Server row - Name of the xMF server
<b>State</b>	Interface row - State of receiving side - cable connected or disconnected Device row - connected if all interfaces are connected, disconnected if all interfaces are disconnected, empty in other case Server row - connected if all interfaces are connected, disconnected if all interfaces are disconnected, empty in other case
<b>IP Frame Read OK</b>	Interface row - The number of IP datagrams read without error Device row - sum of interface values on this device Server row - sum of interface values on this device
<b>IP Frame Dropped</b>	Interface row - Number of IP datagrams dropped Device row - sum of interface values on this device Server row - sum of interface values on this server
<b>IP Packet Received</b>	Interface row - Total number of input datagrams received from interfaces, including those received in error Device row - sum of interface values on this device Server row - sum of interface values on this server
<b>Byte Received</b>	Interface row - The total number of bytes received Device row - sum of interface values on this device Server row - sum of interface values on this server
<b>Error on Device</b>	Interface row - Indicates an error was encountered with a device Device row - sum of interface values on this device Server row - sum of interface values on this server
<b>Dropped by Device</b>	Interface row - Number of IP packets dropped by the IP device Device row - sum of interface values on this device Server row - sum of interface values on this server
<b>FIFO Error on Device</b>	Interface row - Number of FIFO buffer errors on device Device row - sum of interface values on this device Server row - sum of interface values on this server

<b>Frame Error on Device</b>	Interface row - Number of packet framing errors Device row - sum of interface values on this device Server row - sum of interface values on this server
<b>LOF Alarm State</b>	Interface row - State of "Ethernet - Loss of Frame" alarm - activated, deactivated Device row - Number of currently raised alarms on interfaces on this device Server row - Number of currently raised alarms on interfaces on this server
<b>NIBE Alarm</b>	Current state of the ethernet - Network Interface Board Error alarm. Green signifies no alarm, Red signifies the alarm is raised.
<b>MTU</b>	Maximum Transmission Unit of the network interface
<b>Speed</b>	Speed of network interface connection measured in Mbits/s
<b>Additional Info</b>	Any additional info about the card

## Hardware Counters

**Table 41 : Hardware Counter Descriptions**

Hardware Parameter	Counter	Description
<b>Server</b>		
	Server/Subsystem Name	Name of the server and its associated subsystem
	Period end	Time stamp for minute by minute historical data
		Type of application running on the server (NSP, IXP, IMF, PMF)
	CPU User	% of CPU utilization that occurred by executing at the user level
	CPU System	% of CPU utilization that occurred by executing at the system level
	Free Physical Memory	shown in MB
	Total Physical Memory	total physical RAM shown in MB
	Available Physical Memory	Free/Physical Total RAM shown as %
	Free Virtual Memory	shown in MB
	Total Virtual Memory	shown in MB
	Available Virtual Memory	Free/Total Virtual Memory shown as %
<b>Ethernet</b>		
	Server/Subsystem Name	Name of the server and its associated subsystem
	Interface Name	Name of the network interface
	Period End	Time stamp for minute by minute historical data

Hardware Parameter	Counter	Description
	IP Address	IP address of the host
	Type	Type of application running on the server (NSP, IXP, IMF, PMF)
	Octets Received	Avg octet count received per second for each network interface
	Octets Sent	Avg octet count sent per second for each network interface
	Bandwidth	Bandwidth used for each network interface
	Queue	Queue size in packets for each interface. If the number exceeds the value of 2 in a few minutes, the network interface is a bottleneck.
Disk		
	Server/Subsystem Name	Name of the server and its associated subsystem
	Period End	Time stamp for minute by minute historical data
	Partition	Partition Name
	Type	Type of application running on the server (NSP, IXP, IMF, PMF)
	Disk Writing	Writing operation count per second for each hard drive
	Disk Reading	Reading operation count per second for each hard drive
	Octet Written	Octets count written per second for each hard drive
	Octets Read	Octets count read per second for each hard drive
	Queue For Writing	Avg number of writing events in waiting queue for hard drive
	Queue for Reading	Avg number of reading events in waiting queue for hard drive

### Traffic Classification Counters

**Table 42 : Traffic Classification Counter Descriptions**

Counter	Description
Server Name	Name of the PMF server that is running the traffic classifications
TC Name	Name of the traffic classification
Total Bytes (IDB)	Number of bytes received inside IDB



Counter	Description
Total Bytes (PMIA)	Number of bytes received in PMIA socket
Total Packets (IDB)	Number of packets received inside IDB
Total Packets (PMIA)	Number of packets received in PMIA socket
Occupancy Rate (%)	Occupancy rate in percentage
Lost Bytes	Number of bytes lost in PMIA socket
Lost Packets	Number of packets lost in PMIA socket

## PMIA Filter Counters

**Table 43 : PMIA Filter Counter Descriptions**

Counter	Description
Server Name	PMF server name that has the PMIA
Filter ID	Identifier of the PMIA filter line
Filter Name	Label that identifies the PMIA filter line
Total Bytes	Number of bytes received by the interface that match the PMIA filter line
Total Packets	Number of packets received by the interface that match the PMIA filter line

## SigTran Filter Counters

**Table 44 : Sigtran Filter Counter Descriptions**

Counter	Description
Server Name	The name of the server that houses the sigtran process
Last Update and Status	Data and time of the last update. Status of server is calculated as follows: <ul style="list-style-type: none"> <li>• Green difference between last update time and current time is less or equal to 2 minutes</li> <li>• Yellow - difference between last update time and current time is greater than 2 minutes</li> </ul>
Chunk reassembly failure	Total number of chunk reassembly failures
IP reassembly failure	Total number of IP reassembly failures
IP fragmented packet	Total number of IP fragmented packets

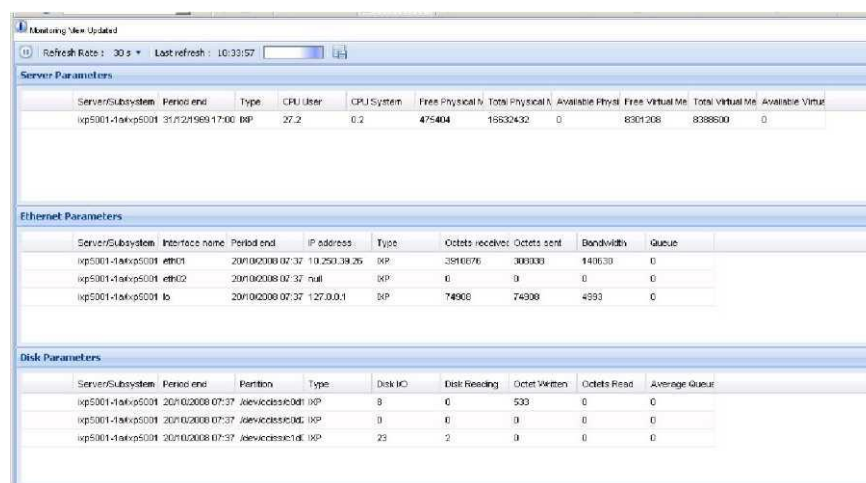
## About Hardware Counters

The right-click Hardware counters option for xMF and IXP enables you to view the *Server Parameters* table, *Ethernet Parameters* table and the *Disk Parameters* table. The information provided in this screen is the same provided for both xMF and IXP subsystems and servers. Complete these steps to view the input streams on an IXP or xMF subsystem or server.

**Note:** The figures and tables shown here are of an IXP subsystem.

1. Select the **Site > IXP or xMF subsystem** you want to monitor.
2. Right-click on the **IXP or xMF subsystem** to open the pop-up menu.
3. Select **Hardware Counters**.

The *Hardware Counters* screen opens.



**Figure 92 : Hardware Counters Screen (IXP Subsystem Shown)**

From this screen you can view the descriptions of the parameters shown in the figures and tables.

### Server Parameters Table

**Figure 93 : Server Parameters Table (IXP Subsystem Shown)**

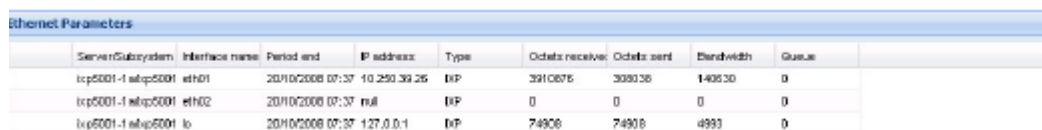
Server Parameters										
Server/Subsystem	Period end	Type	CPU User	CPU System	Free Physical %	Total Physical %	Available Physical	Free Virtual Me	Total Virtual Me	Available Virtual
ixp5001-1atxp5001	31/12/1999 17:00	IXP	27.2	0.2	475404	16532432	0	8301208	8388500	0

Parameter	Description
Server + Subsystem Name	Name of the server that the data flow process belong to as well as the subsystem name
Period end	Time stamp for data

Parameter	Description
Type	Type of application running on the server (IMF, PMF, IXP)
CPU Usage (%)	Time Percentage for CPU used by the application.
CPU System (%)	Percentage of CPU used by the operating system
Total Physical Memory	Total Physical RAM (MB)
Available Physical Memory	Available Physical RAM (MB)
Free Virtual Memory	Available Virtual Memory (MB)
Total Virtual Memory	Total Virtual Memory (MB)
Available Virtual Memory	Available Virtual Memory (MB) during use

Table 45 : Server Parameter Descriptions

## Ethernet Parameters Table



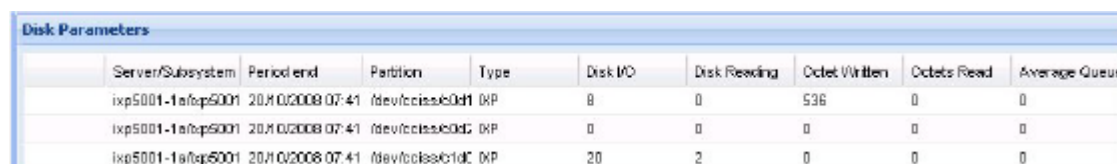
Server/Subsystem	Interface name	Period end	IP address	Type	Octets received	Octets sent	Bandwidth	Queue
ixp5001-1-nlsp5001	eth01	2010/02/08 07:37	10.250.39.25	IXP	3910676	309038	140630	0
ixp5001-1-nlsp5001	eth02	2010/02/08 07:37	null	IXP	0	0	0	0
ixp5001-1-nlsp5001	lo	2010/02/08 07:37	127.0.0.1	IXP	74908	74908	4993	0

Figure 94 : Ethernet Parameters Table (IXP Subsystem Shown) Table

Parameter	Description
Server + Subsystem Name	Name of the server that the data flow process belong to as well as the subsystem name
Interface Name	Name of the interface
Period end	Time stamp for minute per minute historical data
IP address	IP address of the host's network interface (or null)
Type	Type of application running on the server (IMF, PMF, IXP)
Octets received	Octet count received per second for each network interface
Octets sent	Octet count sent per second for each network interface
Bandwidth	Bandwidth used for each network interface
Queue	Queue size in packets for each interface. If the counter exceeds a value of 2 during a few minutes, the network interface is a bottleneck

Table 46 : Ethernet Parameter Descriptions

## Disk Parameters Table



Server/Subsystem	Period end	Partition	Type	Disk I/O	Disk Reading	Octet Written	Octets Read	Average Queue
ixp5001-1-nlsp5001	2010/02/08 07:41	/dev/cciss/c0d1	IXP	8	0	536	0	0
ixp5001-1-nlsp5001	2010/02/08 07:41	/dev/cciss/c0d2	IXP	0	0	0	0	0
ixp5001-1-nlsp5001	2010/02/08 07:41	/dev/cciss/c1d0	IXP	20	2	0	0	0

Figure 95 : Disk Parameters Table (IXP Subsystem Shown) Table

Table 47 : Ethernet Parameter Descriptions

Parameter	Description
Server + Subsystem Name	Name of the server that the data flow process belongs to as well as the subsystem name
Period end	Time stamp for data
Partition	Partition name
Type	Type of application running on the server (IMF, PMF, IXP)
Disk Writing	Writing operation count per second for each Hard Drive
Disk Reading	Reading operation count per second for each Hard Drive
Octet Written (KB/s)	Octets count written per second for each Hard Drive
Octets Read (KB/s)	Octets count read per second for each Hard Drive
Queue for Writing	Average number of writing events in queue for each Hard Drive
Queue for Reading	Average number of reading events in queue for each Hard Drive

### About Reset Count Options for xMF Subsystems

**Note:** The reset options are available only to users with the role *NSPMonitorManager*.

Listed below are the four reset count options on the xMF right-click menu. When you select one of the options listed here. A prompt is displayed asking you to confirm the reset.

To reset counts, click **yes**. The list below explains the different reset options.

Reset count for server in selected xMF subsystem	Cumulative Counts*	Non-Cumulative Counts**
Reset Input Counts (xMF servers)	PDU IN Received* and PDU IN Rejected	PDU IN Speed
Reset Destination Counts (xMF servers)	PDU Transmitted and PDU Failed	PDU Speed
Reset Level 1 Counts (xMF-PMF)	RAI RX, RAI TX, AIS RX, AIS TX, LFA RX, LFA TX, LOS RX, LOS TX, Frame RX and Frame TX	Frame Average Speed RX and Frame Average Speed TX
Reset IP Counts (xMF-PMF)	IP Frame Read OK and IP Frame Dropped	IP Packet Received, Byte Received, Error On Device, Dropped By Device, FIFO Error On Device and Frame Error On Device

Table 48 : Reset Count Options

**Note:** This option also resets the Link State Counts. Link State Counts are displayed in the ProDiag application. See ProDiag User's Guide for more information.

\* indicates cumulative counts. They begin from zero after resetting if conditions for their increment are reached.

\*\* indicates current value and are not cumulative. Their value stays equal to zero after resetting only when data traffic is off, in other cases it will show current values again, so no reset is noticeable in this case.

**Note:** There are more counters that are reset on a PMF server than on an IMF server.

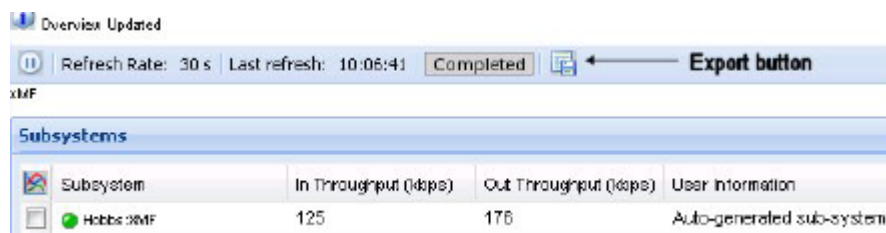
## Exporting Overview Tables in CSV Format

*Diagnostic Utility's export* function enables you to export zipped overview tables in csv format. Complete these steps to use the export function.

1. Select and open an **overview table** from the object tree.

The figure shown below shows a table with the export button highlighted.

**Note:** You can also export overview tables opened from the right-click menu.



**Figure 96 : Export Button Highlighted In Overview Table**

2. Click **export**.

**Figure 97 : Export Screen**



3. The export screen opens shown above.

3. At this step, you can perform one of three options:

- a) **Open** the file (see figure shown below) for inspection.
- b) **Save** the file to the local drive.
- c) **Cancel** the operation.

If you select **Open**, the *Browse* screen opens showing all the tables converted to csv format in a *zip* file shown in the figure below.

**Figure 98 : Zipped Table Files In CSV Format**



## Chapter5: Charting Subsystems and Servers

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## Charting operation in Diagnostic Utility

*Diagnostic Utility* provides a charting operation that enables you to view counts for selected items, (for example, subsystems, servers, destinations, dataflow processing, etc.) in chart format. You can view simple count charts where each chart displays the value of one count for several items. For each item the chart displays one chart line. You can launch one chart for several item counts simultaneously by using check boxes that are displayed by item names in the count tables. You can select up to eight items and up to four counts to be monitored.

The *Chart Monitoring* window is a full-screen window and can contain up to four charts. The chart has an x-axis for time and y-axis for count values. Lines for all items are switched on initially.

### Charting variables for monitored Objects

#### **Parameters charted for IXP servers**

CPU Usage (%)

Memory Free (KB)

#### **Parameters charted for IXP input streams**

Bytes (total number of bytes transmitted)

Records (Total number of records transmitted)

#### **Parameters charted for xDR build process**

Received PDUs

Unknown PDU

Filtered PDU Not

Stored PDU

Received bytes

Generated xDRs

Valid xDRs

xDRs Not Transmitted

Generated bytes

#### **Parameters charted for xDR store process**

Received xDR/KPIs

Stored xDR/KPIs

Rejected records

#### **Parameters charted for xDR operate process**

Received xDR



xDRs enriched

Created KPI

Filtered xDRs

### **Parameters charted for xMF subsystems**

In Throughput (kbps) Out Throughput

(kbps)

### **Parameters charted for xMF servers**

CPU Usage (%)

In Throughput (kbps)

Out Throughput (kbps)

PDU In Speed (#/s) PDU

Out Speed (#/s) PDU

Transmitted (#) PDU

Failed (#) PDU Received

(#) PDU Rejected (#)

### **Parameters charted for xMF destinations**

PDU Transmitted

PDU Failed PDU

Speed (#/s)

### **Parameters charted for xMF Level 1 counts**

Frame Average Speed In (#/s)

Frame Average Speed Out (#/s)

Frame RX

(#) Frame

TX (#)

Alarm occurrences for RAI, LFA, AIS, LOS for RX and TX

### **Parameters charted for xMF IP stats**

IP Frame Read OK

IP Frame Dropped

IP Packet

Received Byte

Received

Dropped by Device - Number of IP packets dropped by the IP device

FIFO Error On Device - Number of FIFO buffer errors on device

Frame Error On Device - Number of packet framing errors

## Using the Chart Monitoring Toolbar

The chart monitoring window has the following controls in its toolbar:

Pause/resume

Refresh rate

Time range

Export as PNG file

Change Color

Completed

These controls enable you to customize the charting capabilities for the object you are monitoring.

## Charting Parameters

Complete these steps to chart parameters at either the subsystem or server level. From either the *Sites* or *Servers* perspective.

1. Select the **item(s)** from the *Overview* screen to be charted.

(In the first two figures shown below the same server is selected from both the *Sites* and the *Servers* perspective. The third figure shows multiple items selected from an xMF server.)

**Note:** You can select up to eight items to monitor.

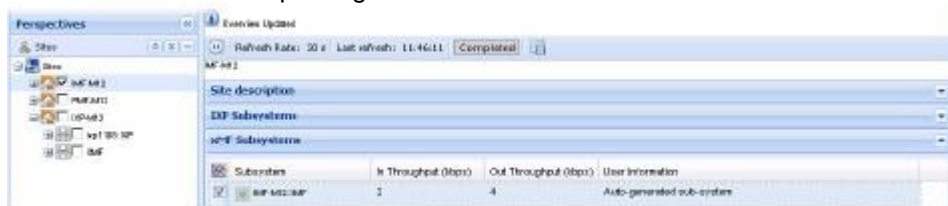
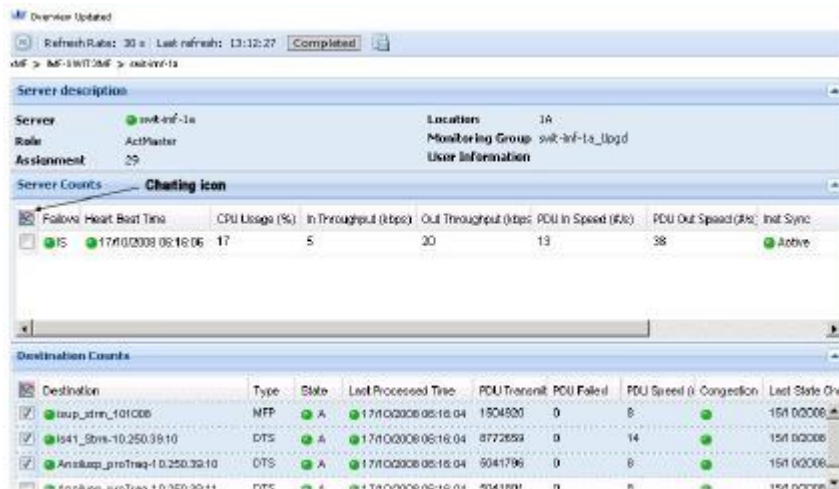


Figure 99 : Selected Subsystem from Site Perspective

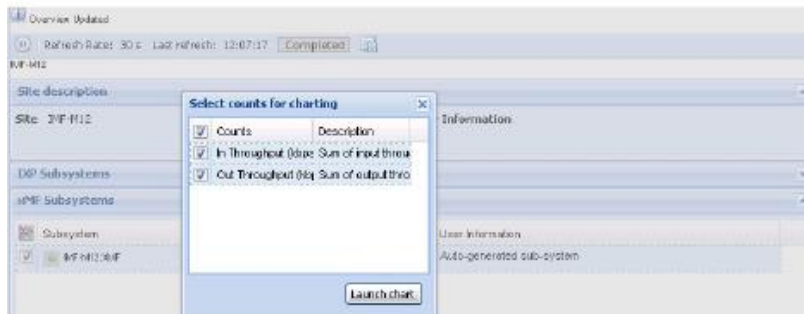


Figure 100 : Selected Subsystem from Server Perspective



**Figure 101 : Selected Destinations from An xMF Server Overview Screen**

2. Click on the chart icon (highlighted in figure above). The Counts pop-up screen opens shown below.



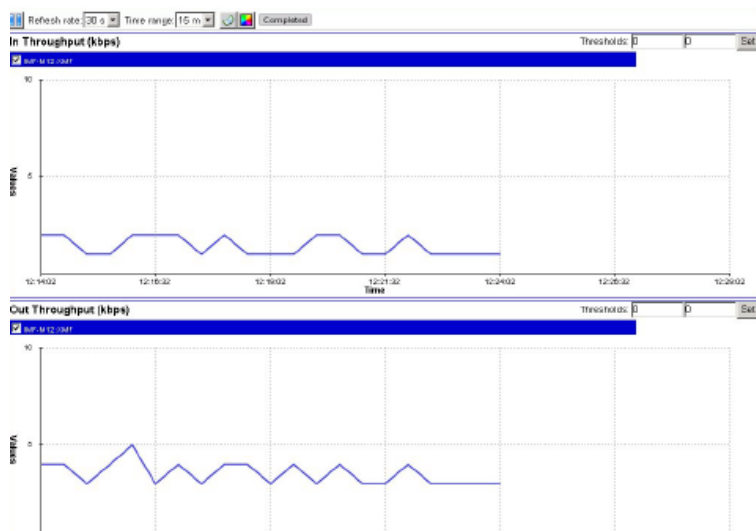
**Figure 102 : Counts Selection Screen (From Sites Perspective)**

3. Select the **counts** to be charted. (You can select up to four counts.)

**Note:** To select all of the counts, select the counts column heading.

4. Click **Launch chart**.

The chart opens shown in the figure below.



**Figure 103 : Counts Selection Screen**

Field/Element	Description
<b>Pause Button</b>	Pauses the monitoring process.
<b>Refresh Rate</b>	Provides the interval when the screen is refreshed.
<b>Time Range</b>	Shown in the x-axis and provides the length of time previous to the current time for and can run for more than the previous 24-hours.
<b>Export to PNG File Button</b>	Enables you to export the chart in PNG file format.
<b>Change Colors to Chart Button</b>	Enables you to choose the colors for each chart line being monitored.
<b>Show line selection</b>	A check box located at the top left corner of the graph enables you to show or not show a graph line.
<b>Thresholds</b>	Provides a visual aid for during the monitoring. The threshold appears as a red line. Threshold = 0 removes the threshold marker.
<b>Set Button</b>	Sets the threshold level which appears in the screen as a red line.
<b>Graph Interface</b>	Values (Y axis) - shows the values (amounts) of counts. Time (X axis) - shows the time range for that chart (using the time zone setting from the preferences operation. See NSP Platform Guide for information on setting time preferences).

To close the chart window, click **x** at the top right-hand corner of the window and then click **OK**.

### Setting a Threshold on a Chart

The threshold operation enables you to have a visual aid for the chart process. You can set an x-axis, y-axis or both when setting thresholds levels.

Complete these steps to create a threshold.

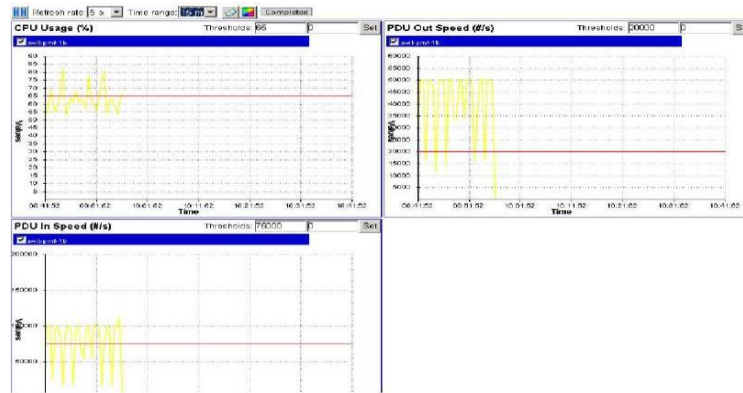
1. Enter an **integer** in either the x-axis and y-axis or both.

**Note:** Number maximum length is 10 digits (for example 1000000000). Therefore the range for a threshold is: 0 - 9999999999.

2. Click **Set**.

The thresholds are set. The figure below shows three x-axis thresholds that are set.

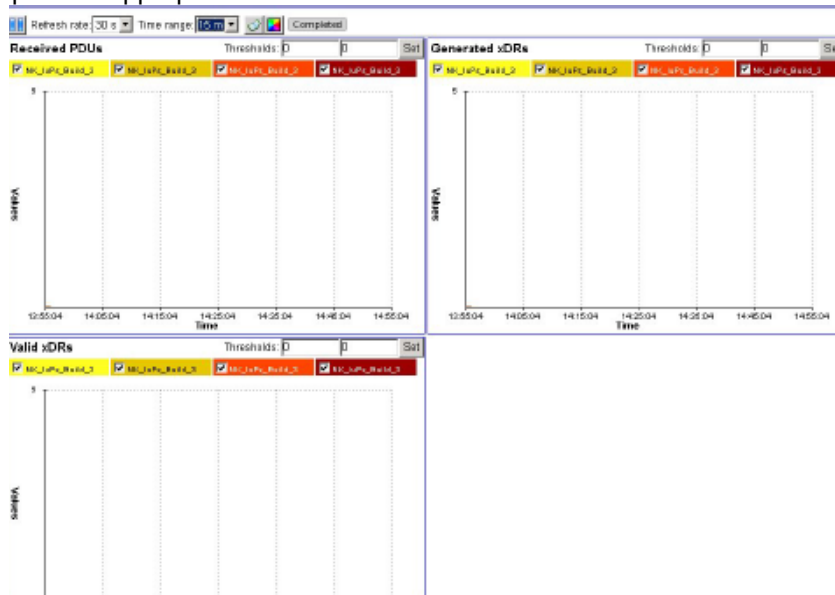
**Figure 104 : Threshold Set**



## Changing Colors on Charts

*Diagnostic Utility* enables you to change the colors on the counters and their graph lines. Complete these steps to change colors on a chart.

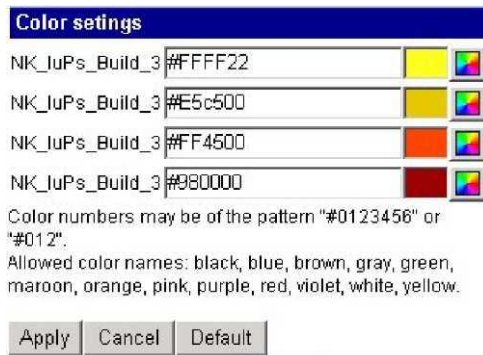
1. Open the appropriate **chart**.



**Figure 105 : Selected Counters Chart**

2. Click Change colors on the chart on the toolbar.

The *Color Settings* pop-up opens shown in the figure below.



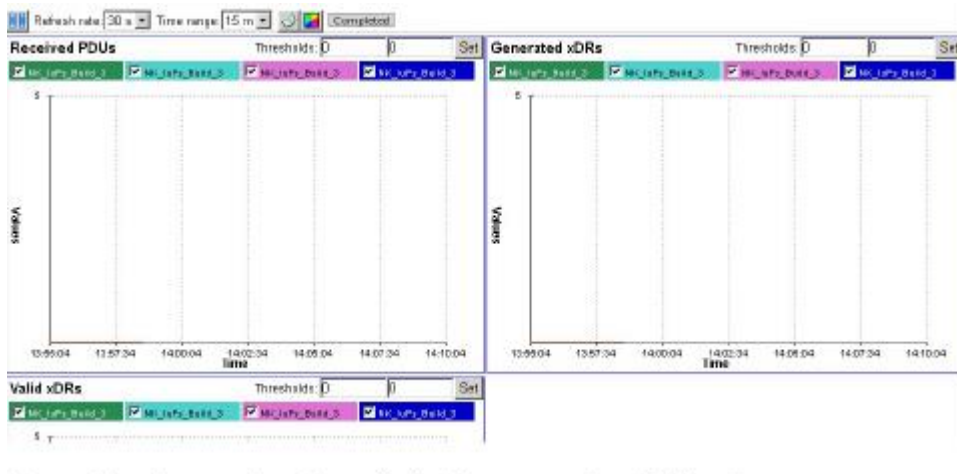
**Figure 106 : Color Settings Popup**

3. Click on the **palette** of each counter you want to change in the field.

**Note:** You can also type in the color code, such as #FFF22, in the field or type in one of the colors shown in the pop-up.

4. Select the **color** for the counter.
5. Click **Apply**.

The counter header and line is changed shown in the figure below.



**Figure 107 : Color Settings Completed**

**Note:** To change back to defaults, open the Color Settings pop-up and click *Default*. The default colors are restored.

## Exporting a Chart as a PNG File

*Diagnostic Utility* enables you to export the chart as a *png* file that can be viewed in a graphic editor program such as *Microsoft Office Picture Manager*.

Complete these steps to export a chart.

1. Open the **chart** that you want to export.
2. Click **Export as PNG file** on the toolbar.

The *File Download* dialogue is displayed.

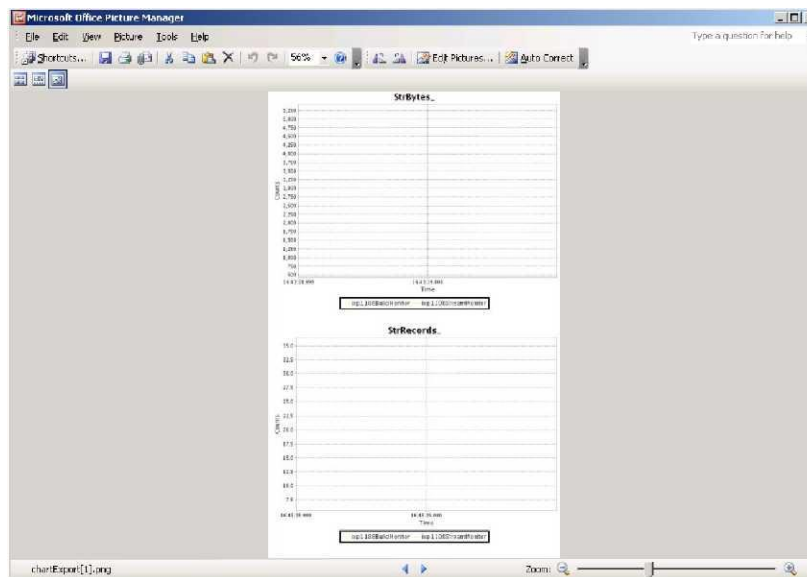


**Figure 108 : File Download Dialogue Box**

3. You can open, save or cancel the export process. a)

To open the file, click **Open**.

The file opens shown below.



**Figure 109 : Open/Save Prompt For Png File Export**

b) To save a file, click **Save** and select the directory path to store the file.



## Chapter6: Resetting PMIA and Traffic Classification Counters

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### Topics:

- *Resetting PMIA Counters .....122*
- *Resetting Traffic Classification Counters.....122*

## Resetting PMIA Counters

This option supports PMIA means Pattern Matching IP Algorithms (PMIA) configuration for PMF.

For monitoring IP traffic, CCM provides a traffic classification for each xMF (PMF) server. Each PMF server can be run in two modes either normal mode or expert mode.

In normal mode, you define IP Filters using CCM and optionally can apply on traffic classification.

In expert mode, you browse the file which can be interpreted by PMF server. While server running in expert mode, all predefined IP filters will be disabled for this server.

The counters for PMIA can be reset by logging into the PMF server and launching the resetLink command. Complete these steps to reset PMIA counters.

1. Login as **cfguser** on each PMF server for either standalone or frame setup.

**Note:** Use the linkDisp -scommand to display in command line.

2. Enter the **cfgPmia resetCounters** command.
3. Click **Enter** to launch the command.

## Resetting Traffic Classification Counters

PIC provides can filter IP traffic the following protocols.

- TCP
- UDP
- ICMP
- SCTP
- RTP

The counters for Traffic Classifications can be reset by logging into the PMF server and launching the resetLink command. Complete these steps to reset traffic classifications counters.

1. Login as **cfguser** on each PMF server, if it is a standalone setup, or on the Primary Server for a frame setup.

**Note:** Use the linkDisp -scommand to display in command line.

2. Enter the **resetLink** command.
3. Click **Enter** to launch the command.

## Glossary

<b>A</b>	
A	Ampere
AIS	Alarm Indication Signal Application Interface Specification The Service Availability Forum (SAF) specification that defines the interface between the applications and the high-available middleware.
<b>C</b>	
Configuration	Dynamic and shorter-term management tasks. These include modifications to parameters. This term is often used interchangeably with provisioning.
CPU	Central Processing Unit
<b>D</b>	
Destination	The node to which the signaling link traffic is routed. This destination is identified by a point code, either a full point code or a cluster point code.
<b>F</b>	
FIFO	First In - First Out
<b>I</b>	
ID	Identity, identifier
IMF	Integrated Message Feeder The IMF sits on the EAGLE and replicates the signaling data that is processed through the EAGLE to send to an off-board processor (the

**I**

	IXP in the case of IAS). Because it replicates the data (and doesn't introduce a new element in the path) it does not introduce any delay to the signaling and it does not create a separate footprint for a "probe" system.
IN	Intelligent Network A network design that provides an open platform for developing, providing and managing services.
IP	Internet Protocol IP specifies the format of packets, also called datagrams, and the addressing scheme. The network layer for the TCP/IP protocol suite widely used on Ethernet networks, defined in STD 5, RFC 791. IP is a connectionless, best-effort packet switching protocol. It provides packet routing, fragmentation and re-assembly through the data link layer.
IS	Information Services
ISUP	ISDN User Part
IXP	An Intel network processor used on the HIPR card.

**K**

Kbps	Kilobits per second
KPI	Key Performance Indicators

Link	<b>L</b> Signaling Link Signaling Link Carries signaling within a Link Set using a specific Association. A Link can belong to only one Link Set and one Association. There is generally one Link per Association in a Link Set.
MB	<b>M</b> Megabyte — A unit of computer information storage capacity equal to 1,048, 576 bytes.
min	minimum
MSU	<b>Message Signal Unit</b> The SS7 message that is sent between signaling points in the SS7 network with the necessary information to get the message to its destination and allow the signaling points in the network to set up either a voice or data connection between themselves. The message contains the following information: <ul style="list-style-type: none"><li>• The forward and backward sequence numbers assigned to the message which indicate the position of the message in the traffic stream in relation to the other messages.</li><li>• The length indicator which indicates the number of bytes the message contains.</li><li>• The type of message and the priority of the message in the signaling information octet of the message.</li><li>• The routing information for the message, shown in the routing label of the message, with the identification of the node that</li></ul>

	<b>M</b>	sent message (originating point code), the identification of the node receiving the message (destination point code), and the signaling link selector which the EAGLE 5 ISS uses to pick which link set and signaling link to use to route the message.
	<b>N</b>	
NO		Network OAM&P
		A server that manages a collection of SOs and their corresponding MPs. NO servers are deployed in active/standby pairs.
NSP		Network Services Part
		The lower layers of the SS7 protocol, comprised of the three levels of the Message Transfer Part (MTP) plus the signaling Connection Control Part (SCCP), are known collectively as the Network Services Part (NSP).
	<b>O</b>	
OS		Operations Systems
	<b>P</b>	
Packet		An independent unit of data (usually up to 1518 octets). Every packet includes delivery information in an area of the packet called the header. In IP networks, this refers to SCTP packets, the unit of data delivery across the interface between SCTP and the connectionless packet network (e.g., IP). An SCTP packet includes the common SCTP header, possible SCTP control chunks, and user data encapsulated within SCTP DATA chunks.

	<b>P</b>	
PDU		Protocol Data Unit
PIC		Point in Call Programmable Interrupt Controller
	<b>R</b>	
RAM		Random Access Memory A type of computer memory that can be accessed randomly; that is, any byte of memory can be accessed without touching the preceding bytes.
RX		Receiv
	<b>S</b>	
Service		Any EAGLE behavior that utilizes NPP.  Service Information Octet. The network indicator code (NIC), priority (PRI), and service indicator (SI) in the SIO field in the message signaling unit (MSU). This information identifies the type of MSU (ISUP, TCAP, and so forth) that is allowed in the network where the EAGLE 5 ISS is located.
SS7		Signaling System #7
Stream		In SCTP, refers to a sequence of user messages that are to be delivered to the upper-layer protocol in order with respect to other messages within the same stream. This is in contrast to its usage in TCP, where it refers to a sequence of bytes (in this document

**S**

a byte is assumed to be eight bits). The stream is a unidirectional logical channel established from one SCTP endpoint to another associated SCTP endpoint. Note: The relationship between stream numbers in opposite directions is strictly a matter of how the applications use them. It is the responsibility of the SCTP user to create and manage these correlations.

**T**

TX

Transmit

**U**

UMTS

Universal Mobile Telecommunications System  
The standard for 3G used by GSM service providers. UMTS includes voice and audio services, for fast data, graphic and text transmissions, along with transmission of moving images and video.