

# IxServer for Windows Chassis

Release 9.39

User Guide

# Notices

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# Contacting Us

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## Keysight headquarters

1400 Fountaingrove Parkway  
 Santa Rosa, CA 95403-1738  
[www.ixiacom.com/contact/info](http://www.ixiacom.com/contact/info)

## Support

Global Support	+1 818 595 2599	<a href="mailto:support@ixiacom.com">support@ixiacom.com</a>
<i>Regional and local support contacts:</i>		
APAC Support	+91 80 4939 6410	<a href="mailto:support@ixiacom.com">support@ixiacom.com</a>
Australia	+61-742434942	<a href="mailto:support@ixiacom.com">support@ixiacom.com</a>
EMEA Support	+40 21 301 5699	<a href="mailto:support-emea@ixiacom.com">support-emea@ixiacom.com</a>
Greater China Region	+400 898 0598	<a href="mailto:support-china@ixiacom.com">support-china@ixiacom.com</a>
Hong Kong	+852-30084465	<a href="mailto:support@ixiacom.com">support@ixiacom.com</a>
India Office	+91 80 4939 6410	<a href="mailto:support-india@ixiacom.com">support-india@ixiacom.com</a>
Japan Head Office	+81 3 5326 1980	<a href="mailto:support-japan@ixiacom.com">support-japan@ixiacom.com</a>
Korea Office	+82 2 3461 0095	<a href="mailto:support-korea@ixiacom.com">support-korea@ixiacom.com</a>
Singapore Office	+65-6215-7700	<a href="mailto:support@ixiacom.com">support@ixiacom.com</a>
Taiwan (local toll-free number)	00801856991	<a href="mailto:support@ixiacom.com">support@ixiacom.com</a>

## Documentation conventions

The following documentation conventions are used in this guide:

### Describing interactions with the UI

You can interact with products by using different input methods: keyboard, mouse, touch, and more. So in most parts of the user documentation, generic verbs have been used that work with any input method. In cases where input-neutral verbs do not work, mouse-specific verbs are used as the first choice, followed by touch-specific verbs as the second choice.

See the following table for examples on how you can interpret the different input methods.

Input-neutral	Mouse	Touch
Select <b>Modify</b> .	Click <b>Modify</b> .	Tap <b>Modify</b> .
Select <b>Accounts &gt; Other accounts &gt; Add an account</b> .	Click <b>Accounts &gt; Other accounts &gt; Add an account</b> .	Tap <b>Accounts &gt; Other accounts &gt; Add an account</b> .
To open the document in Outline view, select <b>View &gt; Outline</b> .	To open the document in Outline view, click <b>View &gt; Outline</b> .	To open the document in Outline view, tap <b>View &gt; Outline</b> .
Select <b>Protocols</b> .	Click the <b>Protocols</b> tab.	Tap <b>Protocols</b> .
-NA-	Double-click the <b>Client</b> wizard.	Double-tap the <b>Client</b> wizard.
Open the <b>Packages</b> context menu.	Right-click <b>Packages</b> to open the shortcut menu.	Long tap <b>Packages</b> to open the shortcut menu.

### Deprecated words

The following words have been replaced with new words, considering the audience profile, our modern approach to voice and style, and our emphasis to use input-neutral terms that support all input methods.

Old usage...	New usage...
shortcut menu, right-click menu	context menu
click, right-click	select
drag and drop	drag

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## What's new in IxServer

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No new feature has been added in this release.

## About this guide

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The information in this section helps you to navigate this guide and make better use of its content. A list of related documents is also included.

The Third-Party Software License document is included with the download package.

## Purpose

This guide provides information about IxServer theory, features, functions, options, and additional test setup details.

## Related Documentation

The following guides may help you learn more about IxServer:

- *IxExplorer User Guide*: Provides details on the usage of the IxExplorer GUI for operation with a Keysight chassis and Keysight load modules.
- *Platform Reference Guide*: Provides a detailed list of all currently supported chassis and load modules, as well as general information regarding various technologies covered by Keysight products.
- *IxOS Tcl Development Guide*: Describes the structure and conventions of the IxExplorer Tcl API and provides detailed information on all API commands.

These guides are available on the CD shipped with the application, and also on the Keysight website at [www.keysight.com](http://www.keysight.com).

In addition to these guides, IxServer context-sensitive Help is available. By pressing F1 or the IxServer's Help, information about the open application window appears. Help content can also be accessed from the Help's table of contents or index.

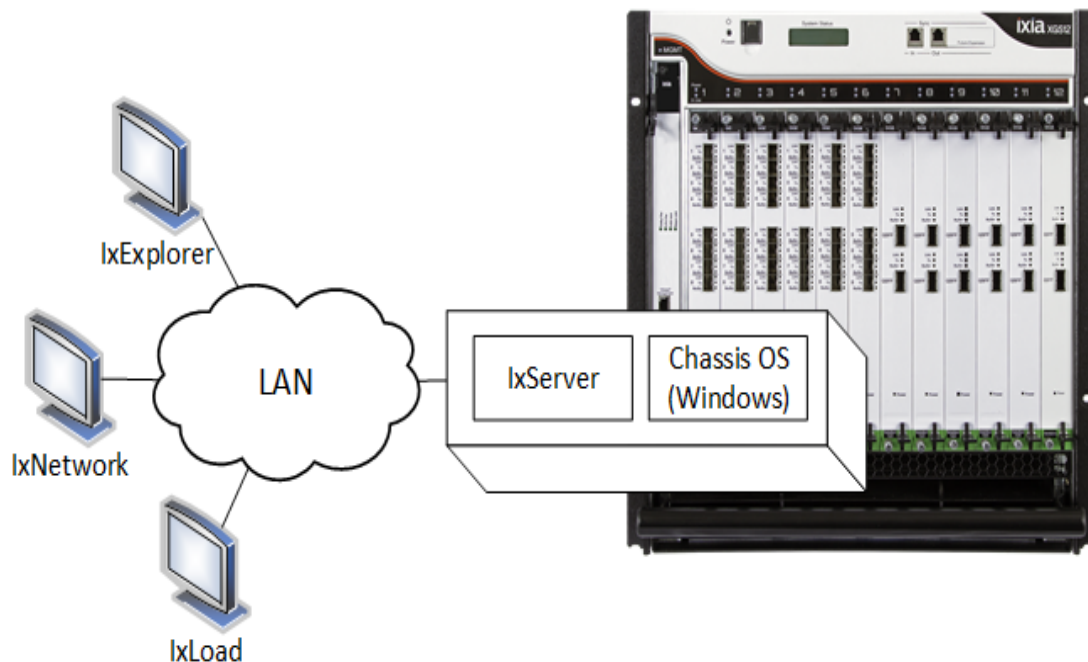
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## Chapter 1: IxServer overview

IxServer is a software application that provides access to the chassis hardware (that is, the load modules and physical ports) and software functions for connected client computers running IxExplorer, IxLoad, IxNetwork, TCL programs, and other applications. It also controls and monitors the chassis.

IxServer is loaded onto the chassis and sits on top of the chassis operating system. When started, IxServer detects the chassis type, the load modules types, and port types, and provides the information to any recognized client computers that have established a connection with IxServer. It also forwards client computer requests to the chassis hardware.

The following image shows client computers connected to IxServer through a LAN:



In this image, three workstations using different client software (IxExplorer, IxNetwork, and IxLoad) are connected to the chassis through IxServer.

Keysight chassis comes with IxServer already installed. IxServer must be running for the chassis to be accessible to clients.

To know how IxServer interacts with Native IxOS, see *Hardware Chassis Management Console Guide*.

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## Chapter 2: Prerequisites

The prerequisites for installing IxServer are as follows.

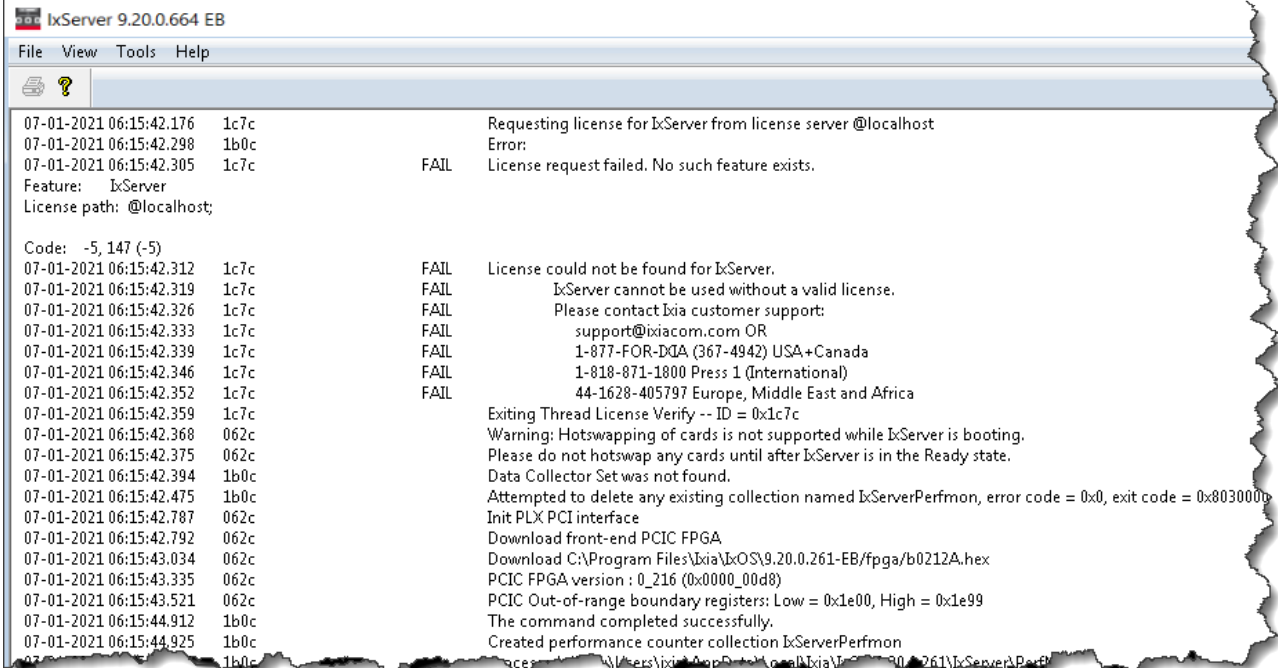
### Hardware requirement

Windows Chassis:

- Windows 10, version 21H1
- Windows 7 Ultimate 32-bit

### License requirement

IxServer is a licensed component of IxOS. It must have a registered license before it can be used. If the current version of IxServer does not have a valid license, when IxServer starts, it shows error messages in the IxServer main window, as shown in the following image:



```

IxServer 9.20.0.664 EB
File View Tools Help
07-01-2021 06:15:42.176 1c7c Requesting license for IxServer from license server @localhost
07-01-2021 06:15:42.298 1b0c Error:
07-01-2021 06:15:42.305 1c7c FAIL License request failed. No such feature exists.
Feature: IxServer
License path: @localhost;
Code: -5, 147 (-5)
07-01-2021 06:15:42.312 1c7c FAIL License could not be found for IxServer.
07-01-2021 06:15:42.319 1c7c FAIL IxServer cannot be used without a valid license.
07-01-2021 06:15:42.326 1c7c FAIL Please contact ixia customer support:
07-01-2021 06:15:42.333 1c7c FAIL support@ixiacom.com OR
07-01-2021 06:15:42.339 1c7c FAIL 1-877-FOR-DXA (367-4942) USA+Canada
07-01-2021 06:15:42.346 1c7c FAIL 1-818-871-1800 Press 1 (International)
07-01-2021 06:15:42.352 1c7c FAIL 44-1628-405797 Europe, Middle East and Africa
07-01-2021 06:15:42.359 1c7c Exiting Thread License Verify -- ID = 0x1c7c
07-01-2021 06:15:42.368 062c Warning: Hotswapping of cards is not supported while IxServer is booting.
07-01-2021 06:15:42.375 062c Please do not hotswap any cards until after IxServer is in the Ready state.
07-01-2021 06:15:42.394 1b0c Data Collector Set was not found.
07-01-2021 06:15:42.475 1b0c Attempted to delete any existing collection named IxServerPerfmon, error code = 0x0, exit code = 0x8030000
07-01-2021 06:15:42.787 062c Init PLX PCI interface
07-01-2021 06:15:42.792 062c Download front-end PCIC FPGA
07-01-2021 06:15:43.034 062c Download C:\Program Files\Ixia\IxOS\9.20.0.261-EB\fpga\b0212A.hex
07-01-2021 06:15:43.335 062c PCIC FPGA version : 0_216 (0x0000_00d8)
07-01-2021 06:15:43.521 062c PCIC Out-of-range boundary registers: Low = 0x1e00, High = 0x1e99
07-01-2021 06:15:44.912 1b0c The command completed successfully.
07-01-2021 06:15:44.925 1b0c Created performance counter collection IxServerPerfmon
07-01-2021 06:15:44.925 1b0c

```

#### NOTE

For information on installing IxOS, see the *IxOS Getting Started Guide*. For information on licensing, see the *Ixia Licensing Utility User Guide*. You can download this guide from the [License Server](#) support page.

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## Chapter 3: IxServer features

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This section explains the conceptual information for some of the features of IxServer.

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## Managed Mode

**Managed Mode** enables an administrator to assign ports to users and groups of users. It allows users and groups to view and configure only those ports for which they have ownership. Different users and groups of users can be assigned to use different or overlapping sets of ports, and a user group is only able to see the ports assigned to them.

### NOTE

If **Secured Mode** is active, **Managed Mode** is not accessible (disabled).

To know the steps to activate Managed Mode, see [Activate Managed Mode](#).

## Managed Mode rules

The following rules apply to an IxExplorer user when IxServer is in Managed Mode:

- When not in a group, you are only able to see ports that are not assigned to any group.
- When you are in one or more groups, you are able to see only those ports assigned to the group (s) they belong to.
- All users of the same group can view and perform actions on all the ports of that group.
- A user can be assigned to multiple groups.
- A port can be assigned to multiple groups.

## Secured mode

Secured mode separates users into Administrators and Operators. Administrators have read and write privileges on the chassis, while Operators only have read privileges. This is also referred to as secured multiuser operation, and is explained in *IxExplorer Operation* in the *IxExplorer Users Guide*.

## Performance Monitoring

The Windows Performance Monitor (PerfMon) tool has been integrated into IxServer to help identify system-level and application-level performance issues. PerfMon is a powerful diagnostic tool that monitors the state of IxServer and creates log files that you can access and submit to Keysight Technical Support, if needed.

Some of the features of the Performance Monitor are the following:

- The monitoring process runs automatically when IxServer starts.
- Log files are created and stored in the folder %LOCALAPPDATA%\Ixia\IxOS\9.x.x.x\IxServer\PerfMon\. To view these files, select **File**, and then select **Open IxServer Logs Location**.
- Log files are identified by the extension .blg and can be opened by double-clicking and viewed in Windows Performance Monitor. Use the relog command to post-process these files if required.

### NOTE

Windows *Performance Monitor* is a separate system monitoring application that is integrated into IxServer but is not accessible through the **Tools** menu.

## Logman

If you want to check which particular counters are available in the currently installed IxOS release, type the following command from an Administrator prompt while IxServer is running:

```
logman query IxServerPerfmon
```

## Windows Disk Cleanup

PerfMon automatically archives the .blg files to a compressed .cab file at set intervals. Windows Disk Cleanup automatically cleans up PerfMon files and the archives after 60 days.

In a complex environment with many Windows machines, we recommend you to use a Group Policy to set up Disk Cleanup consistently across the board. See [Automatic Disk Cleanup with Group Policy and SCCM](#) for more information.

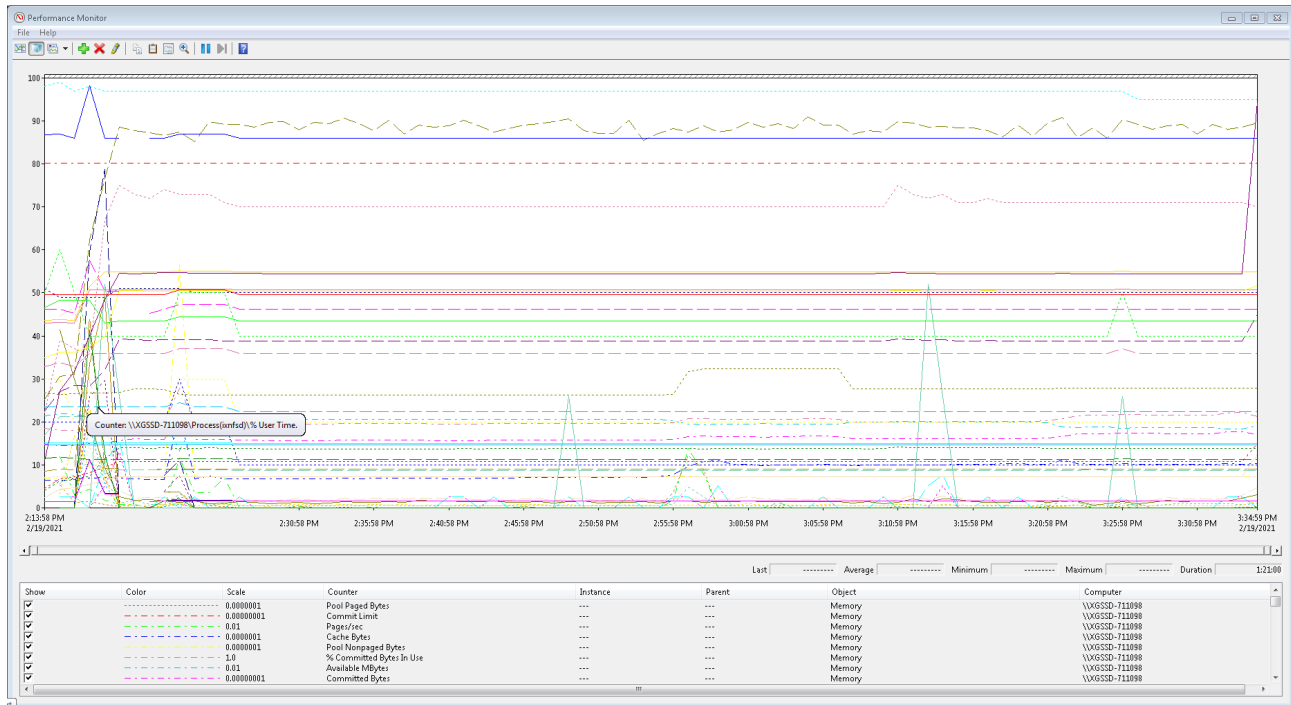
## System Specific Counters

System-specific counters that are implemented and recorded in log files include the following:

Counters	Definition
Processor(_Total)\% Processor Time	How 'loaded' the CPU is at any given time.
PhysicalDisk(_Total)\Avg. Disk Queue Length	The average number of both read and write requests that were queued for all the disks during the sample interval.
Memory\Pages/sec	The rate at which pages are read from or written to disk to resolve hard page faults. This counter is a primary indicator of the kinds of faults that cause system-wide delays.
Memory\Available MBytes	The amount of physical memory available to processes running on the computer.
Memory\Pool Nonpaged Bytes	The size in bytes of the nonpaged pool (system memory area for objects that cannot be written to disk but remain in physical memory as long as they are allocated).
Memory\Pool Paged Bytes	The size in bytes of the paged pool (system memory area for objects that can be written to disk when they are not being used).
Memory\% Committed Bytes In Use	The ratio of committed memory and commit counter. This counter shows the current percentage value only, not the average. Committed memory is the physical memory in use for which space has been reserved in the paging file should it need to be written to disk.
Memory\Commit Limit	The amount of the virtual memory that can be committed without having to extend the paging file(s). Committed memory is the physical memory which has space reserved on the disk paging files. There can be one paging file on each logical drive. If the paging file(s) are expanded, this limit increases accordingly. This counter shows the last observed value

	only, not the average.
Memory\Committed Bytes	The amount of committed virtual memory, in bytes. Committed memory is the physical memory which has space reserved on the disk paging file (s). There can be one or more paging files on each physical drive. This counter shows the last observed value only, not the average.
\\Memory	RAM memory usage statistics.
\\Cache	Disk Cache subsystem statistics.
\\LogicalDisk(*)	C, D, E, and other drives.
\\PhysicalDisk(*)	Hard disk activity statistics.
\\Paging File(*)	Virtual memory backing store information.
\\Processor Information(*)	Processor % Time User vs. privileged DPC/Interrupts and C1/C2/C3.
\\Synchronization(*)	Shared or synchronized objects and Spinlocks activity.
\\System	System performance and throughput statistics.
\\Process(*)	All the counters for all the processes in the system.
\\Thread(*)	Context switch and state information.
\\Network Interface (*)	All about the NICs installed in the chassis.
\\IPv4	Datagram statistics.
\\TCPv4	TCP protocol activity and errors.
\\UDPv4	UDP protocol activity and errors.
\\Terminal Services	RDP session activity.

You can double-click the PerfMon native BLG file to see the graphs as shown in the following image:



## IxServer Specific Counters

Counters	Definition
Process (IxServer)\%Processor Time	The percentage of elapsed time that all IxServer threads used the processor to execute instructions. Code that was executed to handle some hardware interrupts and trap conditions is included in this count.
Process (IxServer)\Working Set	The current size (in bytes) of the set of the memory pages touched recently by IxServer threads. If free memory in the computer is above a threshold, pages are left in the Working Set of a process even if they are not in use.
Process (IxServer)\Handle Count	The total number of handles currently open by IxServer. This number is equal to the sum of the handles currently opened by each thread in IxServer.
Process(IxServer)\Page File Byte	The current number of bytes that this process has used in the paging file(s). Paging files are used to store pages of memory used by the process that are not contained in the other files. Paging files are shared by all processes, and the lack of space in paging files can prevent other processes from allocation memory.
Process(IxServer)\Pool Nonpaged Bytes	The size in bytes of the nonpaged pool, an area of system memory (physical memory used by operating system) for objects that cannot be written to disk, but must remain in physical memory as long as they are allocated. Memory\Pool Nonpaged Bytes is calculated differently than this, so it might not equal Process\Pool Nonpaged Bytes\Total. This counter shows the last observed value only, not an average.

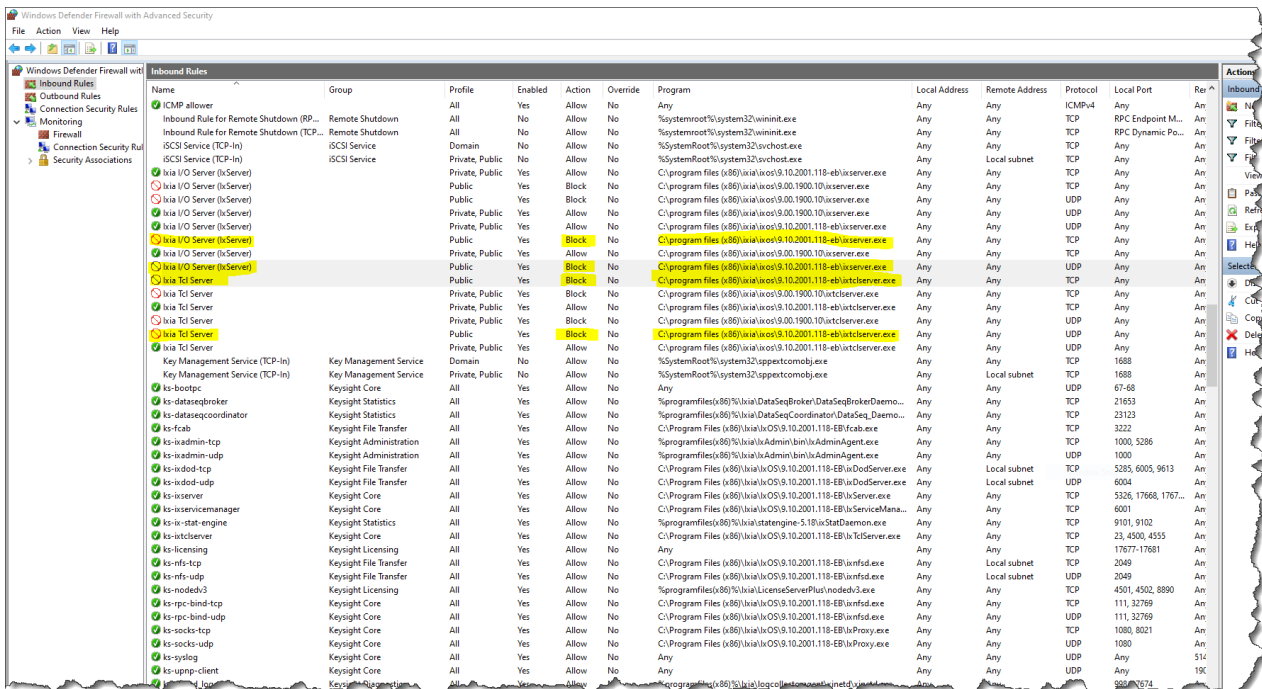
Process(IxServer)\Pool Paged Bytes	The size in bytes of the paged pool, an area of system memory (physical memory used by the operating system) for objects that can be written to disk when they are not being used. Memory\Pool Pages Bytes is calculated differently than this, so it might not equal Process\Pool Pages Bytes\_Total. This counter shows the last observed value only, not an average.
Process (IxServer)\Virtual Bytes	The current size, in bytes, of the virtual address space that IxServer is using. Use of virtual address space does not necessarily imply corresponding use of either disk or main memory pages. Virtual space is finite, and the process can limit its ability to load libraries.

## Firewall support on Windows chassis

On starting up IxServer, it checks the firewall rules automatically. The rules programmed by IxOS are all named starting with 'ks-'.

**NOTE**

Any rule named 'Ixia Tcl Server' or 'Ixia I/O Server (IxServer)' may have been created by Windows if you attempted to run an older IxOS version without Firewall support, and then enabled the Firewall. In that case, Windows will attempt to program the rules for you, but that will not be sufficient for correct operation. These rules should be deleted.



### Commands to check the Firewall state

Following are the commands to check firewall state in the chassis:

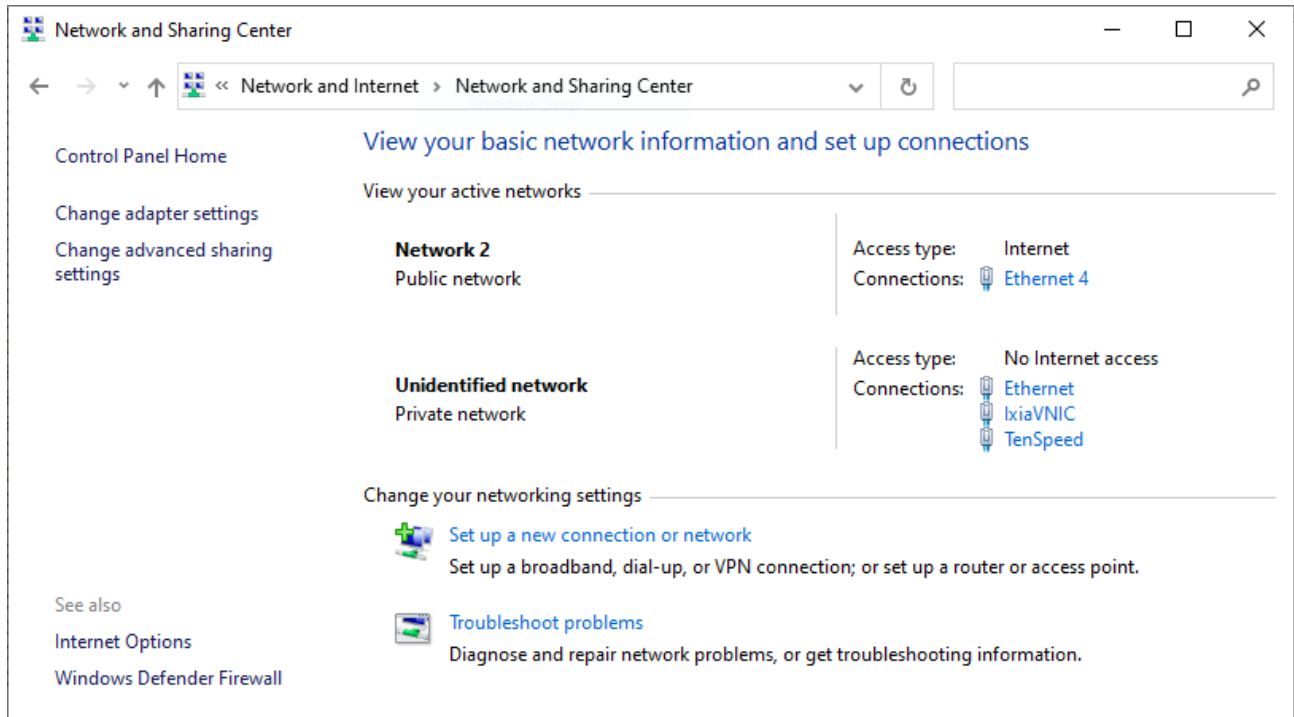
- Windows 7 chassis:

```
netsh advfirewall show allprofiles
```

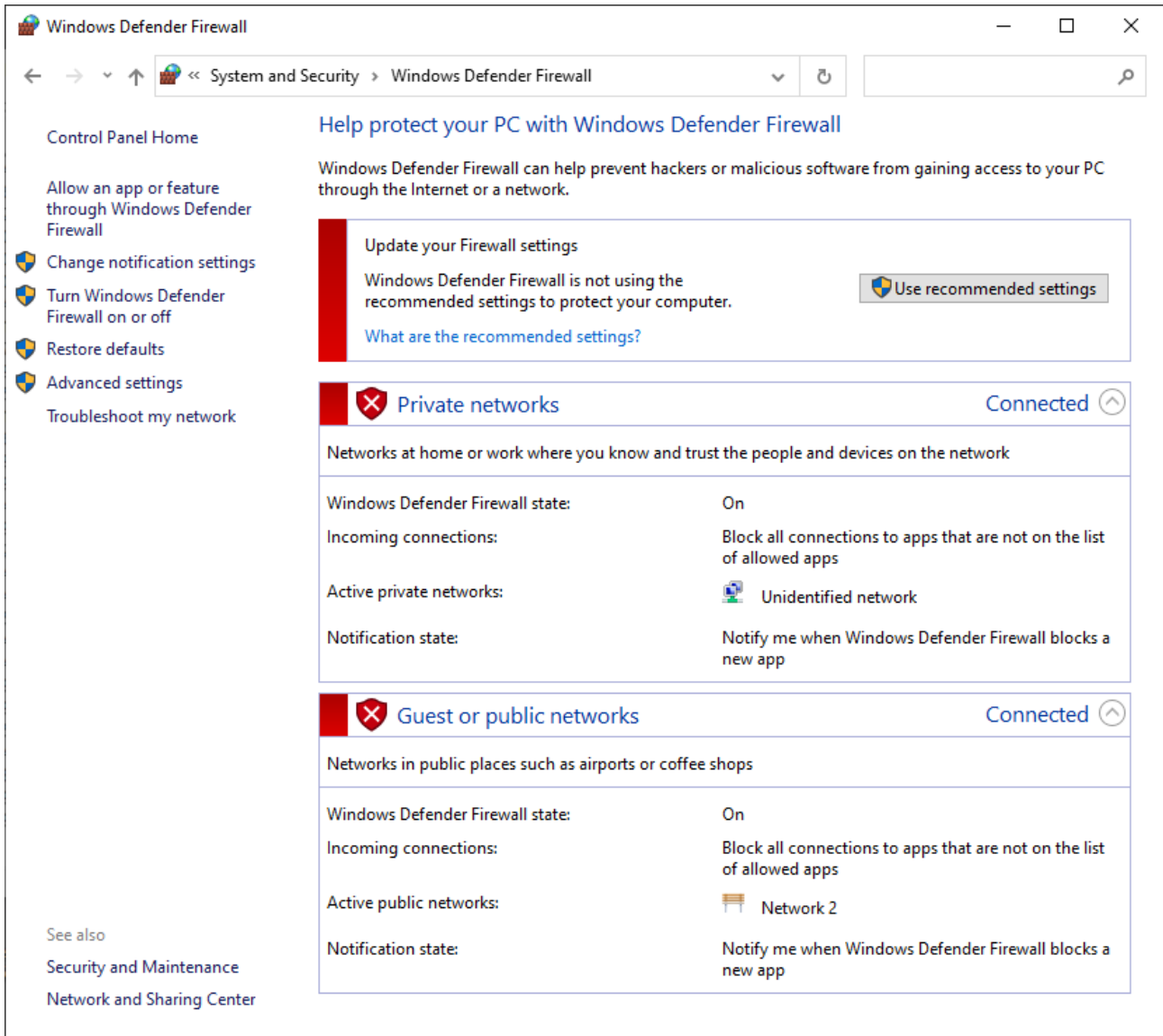
- Windows 10 (PowerShell):

```
Get-NetFirewallProfile
```

Internal networks such as IxiaVNIC and TenSpeed, are excluded from firewall so that it does not interfere with any internal rules.



These networks will appear highlighted in red in the **Windows Defender Firewall** screen.



**NOTE** If you turn on the firewall, you can switch to other IxOS versions, which support firewall.

## Chapter 4: IxServer tasks

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There are various configurable IxServer options. The **Tools** menu provides access to server tools that you can configure, run diagnostic tests, set the security feature, and configure the restricted access and ownership of ports by users and groups of users.

This section explains the primary IxServer tasks, based on starting and exiting IxServer and the available menu bar options.

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## Start IxServer

You can start IxServer in different ways.

### Start automatically from Startup

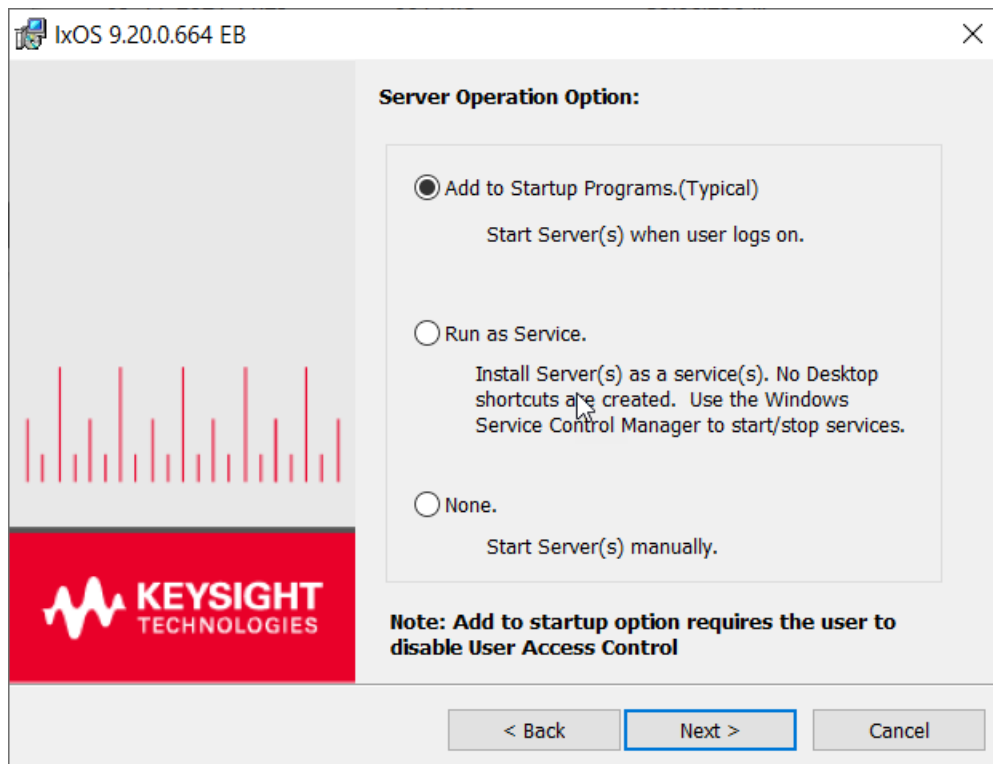
You can configure IxServer to start automatically when the chassis powers up. No operator intervention is necessary.

When you install an IxOS build, IxOS copies the shortcuts for TCL server and IxServer in the startup folder. When you restart a chassis, these servers restart automatically.

### Start as service

While installing the build, if you select **Run as Service**, IxOS installer will create a Windows Service for IxServer (or TCL Server), which you can start or stop from Windows Service Control Manager. Desktop Shortcuts and IxServer User Interface are not available.


If you want to configure IxServer or TCL Server, you must stop the service, manually invoke server from Start Menu shortcuts, close the server, and restart the service.



### Start from desktop shortcut

You can start or stop IxServer or TCL Server manually from desktop or Start menu shortcuts.

To start IxServer from desktop shortcut, do the following:

- Double-click the desktop icon  to start IxServer, which was installed as part of the IxOS installation process.

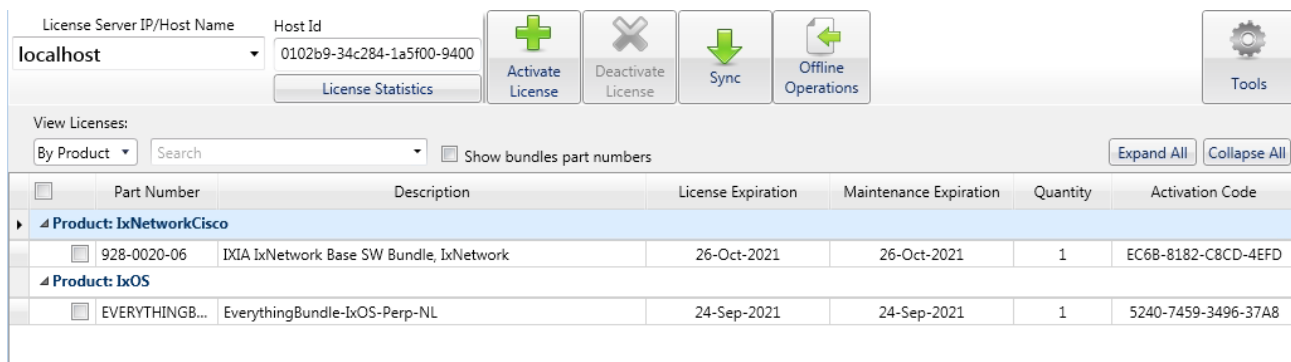
**NOTE**

IxServer may automatically run when the chassis is powered up, so it is not always necessary to manually start IxServer.

## Manage licenses

To manage licenses from IxServer, do the following:

1. Select **Help > Licensing > Manage Licenses**. **Licensing Utility** dialog box opens showing the list of available licenses.



<input type="checkbox"/>	Part Number	Description	License Expiration	Maintenance Expiration	Quantity	Activation Code
Product: IxNetworkCisco						
<input type="checkbox"/>	928-0020-06	IXIA IxNetwork Base SW Bundle, IxNetwork	26-Oct-2021	26-Oct-2021	1	EC6B-8182-C8CD-4EFD
Product: IxOS						
<input type="checkbox"/>	EVERYTHINGB...	EverythingBundle-IxOS-Perp-NL	24-Sep-2021	24-Sep-2021	1	5240-7459-3496-37A8

2. Select the license and select **Activate License**.

For information on licensing, see the *Ixia Licensing Utility User Guide*. You can download this guide from the [License Server](#) support page.

## Modify main window view

You can modify the manner in which the main IxServer window is shown by using the **View** menu. This menu allows you to add or remove the Toolbar and Status bar from the window. By default, both the tool bar and the status bar are shown when IxServer is run.

- To hide the tool bar, select **View > Toolbar**.
- To hide the status bar, select **View > Status Bar**

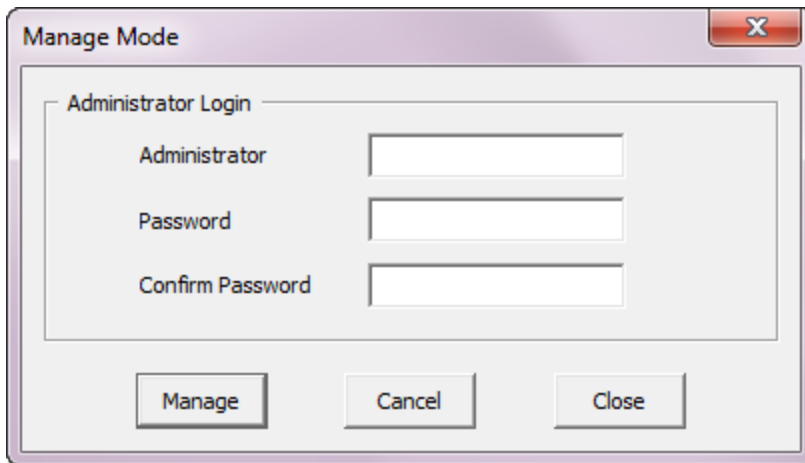
You can hide both the Toolbar and the Status bar simultaneously.

## Activate Managed Mode

A list of managed mode rules are given in [Managed Mode rules](#).

To activate Managed Mode, do the following:

1. On the **Tools** menu, select **Managed Mode**. The **Manage Mode** dialog box appears as shown in the following image:



2. Enter the Administrator name and password credentials.

**NOTE**

- If **Managed Mode** is used on this chassis for the first time, the Administrator and password credentials entered at this point will be configured and saved for later use of **Managed Mode** only by the Administrator of the chassis.
- If **Managed Mode** has been previously configured on the chassis, enter the Administrator name and credentials in the **Administrator**, **Password**, and **Confirm Password** boxes.

3. Select **Manage**. The **Manage Assignments** dialog box appears. This allows you to activate Managed Mode, configure users, groups, and change administrator password.

4. Select the **Enable Managed mode** check box to activate the managed mode.

## Enable secured mode

To secure IxServer, do the following:

1. On the **Tools** menu, select **Secured Mode** to open the **Secure Mode** dialog box. A dialog box opens warning of the properties of secured mode, as shown in the following image:

2. Select **Yes** to open the **Secure Mode** dialog box as shown in the following image:

Secure Mode
✕

---

Server is in unsecured mode.

Please enter the administrator identity in order to switch modes.

Administrator name:

Password:

Confirm password::

---

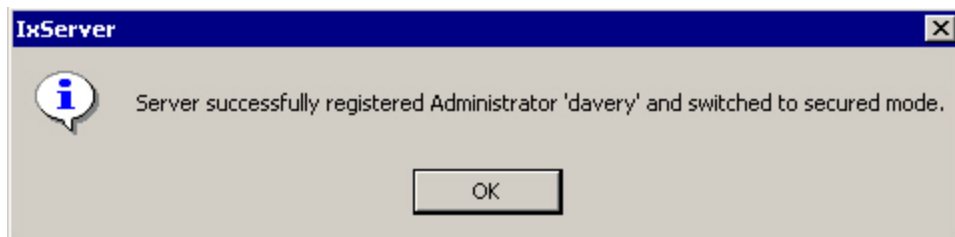
Change mode

Unregistered users will have no access to the chassis.  
All existing client connections will be forced to reconnect and login.  
There are no clients connected at this time.  
Use IxExplorer User Management menu to register other users.

- Provide the details in the **Secure Mode** dialog box and select **Enter Secure Mode** to set up the administrator account and activate secured mode. A dialog box appears, confirming that IxServer and the chassis is locked to everyone except the specified administrator.

**NOTE**

Administrator name must be alphanumeric.



- Select **OK** to place IxServer and the chassis in secured mode. This action blocks all current connections, and all users on the chassis are immediately initiated to log on.

Initially, only the user name and password of the administrator is accepted. The administrator can add users to the chassis from IxExplorer, and make a user either an operator (read privileges only) or an administrator (read and write privileges).

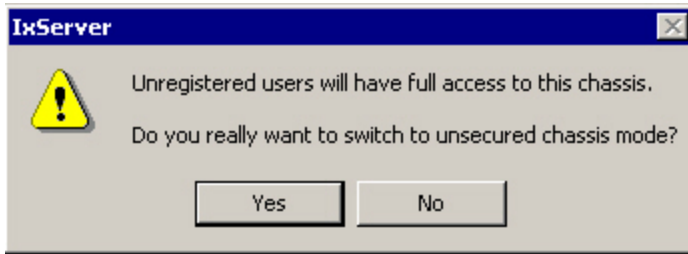
A check mark is also placed next to **Secured Mode** in the **Tools** menu.

For more information on secured multiuser mode, see *IxExplorer Operation* in the *IxExplorer Users Guide*.

## Disable secured mode

To unlock IxServer for all users after it has been set to secured mode, do the following:

1. On the **Tools** menu, select **Secured Mode** to open the **Secure Mode** dialog box. A dialog box appears warning about the properties of secured mode, as shown in the following image:



2. Select **Yes** to open the **Secure Mode** dialog box.
3. To deactivate secured mode, enter the administrator credentials or the credentials of any user name with administrator privileges.
4. Select **Exit Secure Mode**. A dialog box appears, confirming that IxServer and the chassis is now unlocked to all users.
5. Select **OK** to reactivate any currently locked-out user connections on the chassis.

## Configure users

To configure users, complete the steps in this section.

### Add a user

To add a user, do the following:

1. In the **Users** box, select **Add User** to create a new user.
2. In the **User** dialog box appears, enter the user's name, and then select **OK**.

### Modify a user

To modify a user name, do the following:

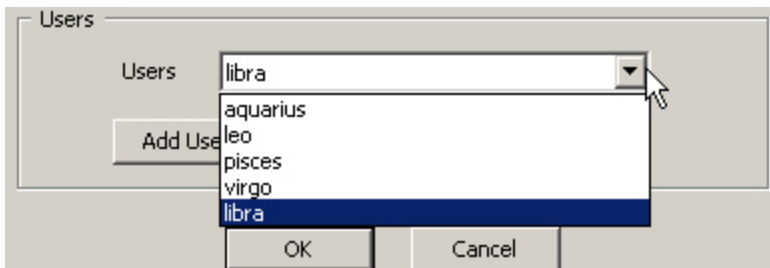
1. To modify a user's name, select **Modify User**.
2. In the **User** dialog box modify the user's name, and then select **OK**.

### Delete a user

To delete a user, do the following:

- Select the user's name and select **Delete User**.

The following image shows a sample list of 5 users:



## Configure groups

You must have administrator privileges to add, modify, or delete a group.

### Add a group

To add a group, do the following:

- In the **Groups** box, select **Add Group** to create a new group. The **Group** dialog box appears, where you enter the group's name, and then select **OK**.

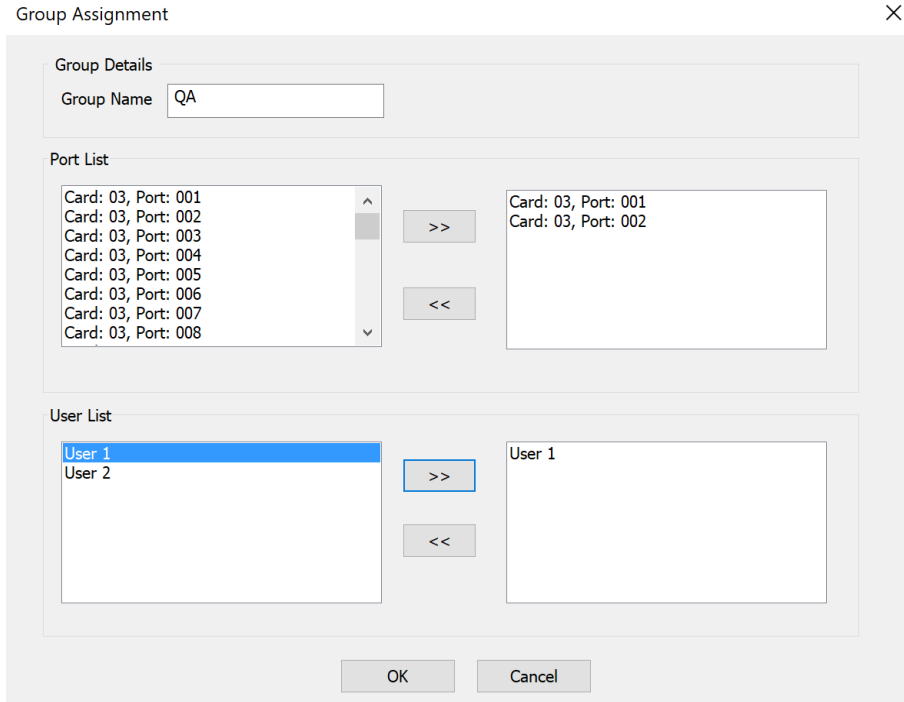
### Modify a group

To modify a group name, do the following:

1. Select the name of the group and select **Modify Group**. The **Group Assignment** dialog box appears. You can assign ports to the users in the group in this dialog box. You must define the users as <machine\_name>\<user\_name>. For example, appserver1\admin01.
2. Select the ports in the **Port List** and select >> to include them in the group and select << to exclude them from the group.
3. Select the users in the **User List** and >> to include them in the group and select << to exclude them from the group.
4. Select **OK** to close the dialog box and confirm the changes. The **Manage Assignments** dialog box again appears.
5. Select **OK** in the **Manage Assignments** dialog box to save the changes.

The configuration is saved on the server in a file named *IxServer.ixmd*, which automatically loads when IxServer starts. Any subsequent changes to the Managed Mode configuration overwrites the *IxServer.ixmd* file. If you erase this files, the Managed Mode configuration data is lost.



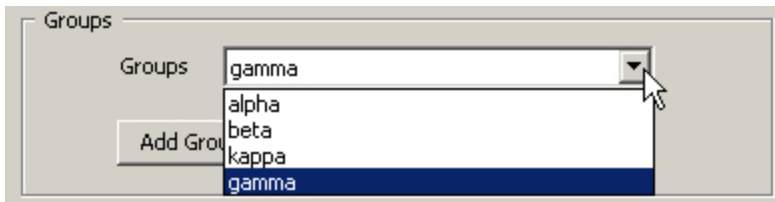


## Delete a group

To delete a group, do the following:

- Select the name of the group and select **Delete Group**.

The following image shows a sample list of four groups:



## Configure Options

The **Options** dialog box allows you to configure IxServer logging, appearance, sockets used, activate features, and configure the IxServer usage modes, including extended capture, diagnostic, and Mandatory Ownership modes.

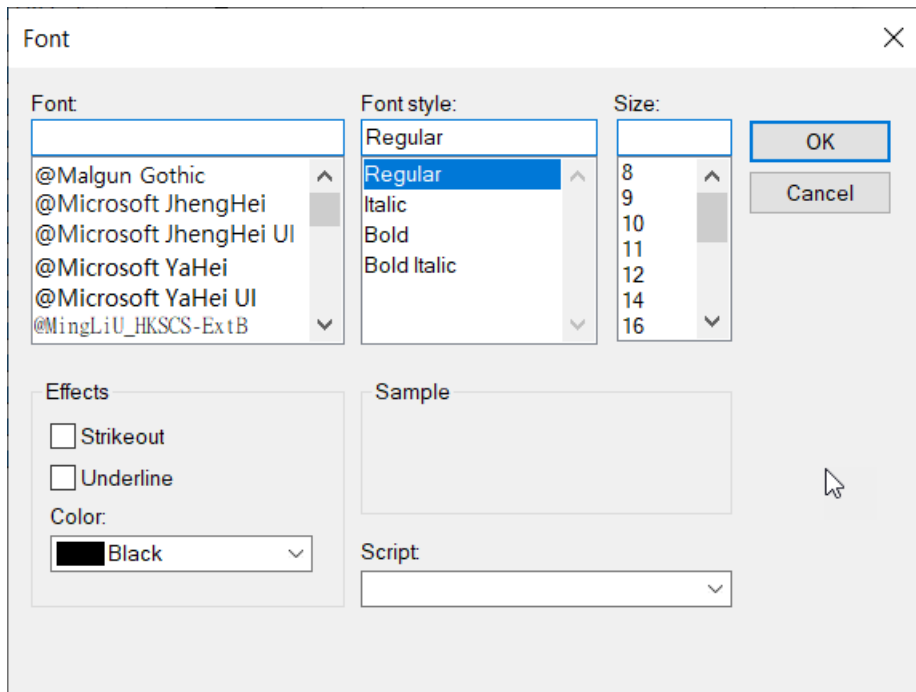
To configure **Options**, do the following:

1. On the **Tools** menu, select **Options** to show the **Options** dialog box.
2. Configure the **General**, **Power-up Test**, **Hardware Parameters**, and **Event Logging** tabs as you want. See [Options](#) to know the definitions of different controls on these tabs.

## Change IxServer appearance

You can change the appearance of the text in the IxServer task window. To change the appearance, do the following:

1. Go to **Tools > Options** to open the **Options** dialog box.
2. On the **General** tab, in the **Appearance** group, select **Font** to open the **Font** dialog box.



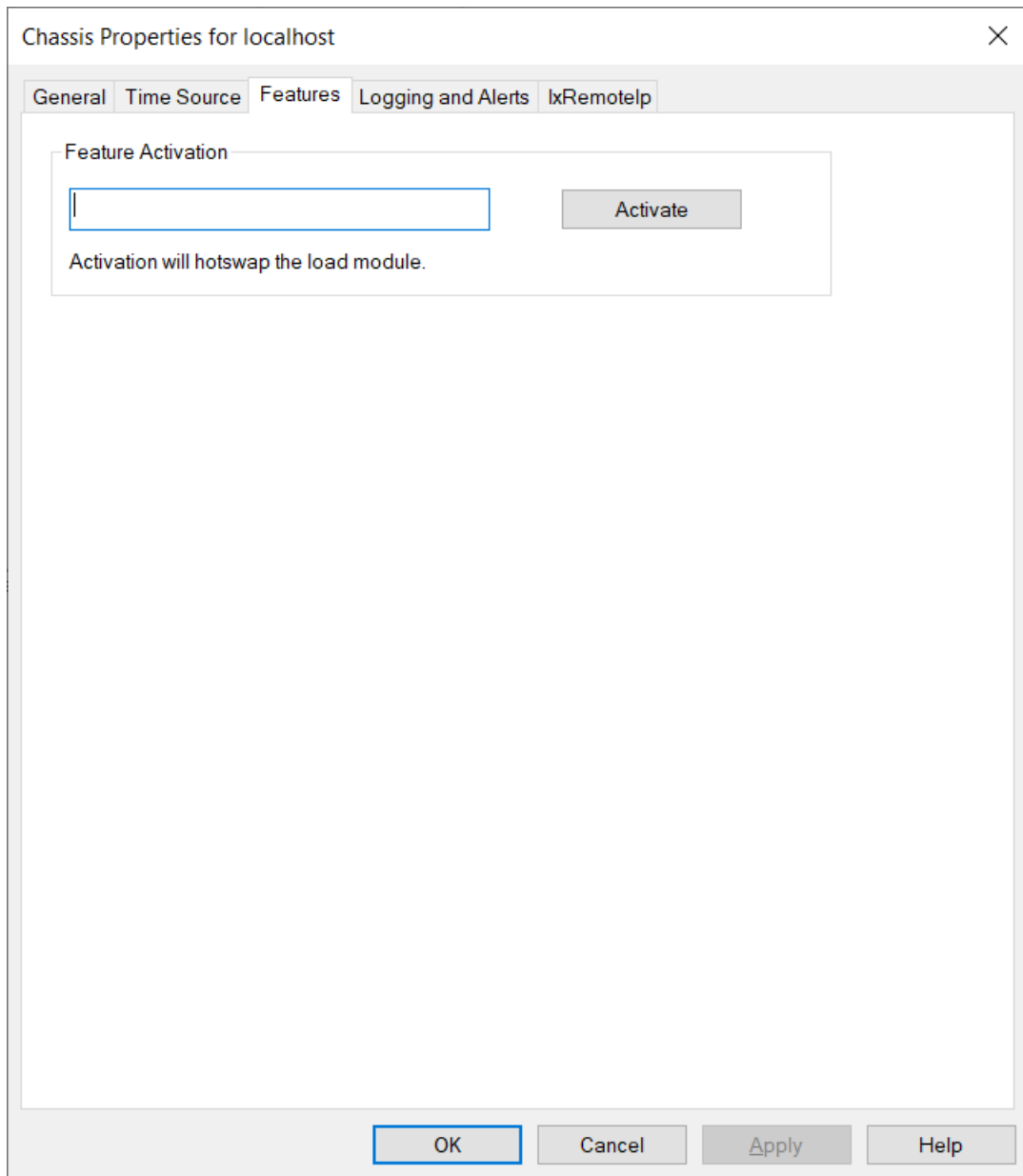
3. Change the **Font**, **Font style**, **Size**, **Effects**, **Color**, and **Script** from the options available and select **OK**.
4. In the **Options** dialog box, select **Apply** to apply the changes to the text.
5. Select **OK** to close the **Options** dialog box.

## Activate feature

You can field upgrade a load module by activating a feature you want. You can purchase a feature for a load module with a specific serial number. You will receive an email from us containing an activation code. Before activating the feature, in IxExplorer, you must take ownership of the load module you want to upgrade. You cannot hot-swap the load module to complete the activation procedure.

After you have taken ownership, do the following:

1. Go to **Tools > Options** to open the **Options** dialog box.
2. On the **General** tab, in the **Feature Activation > Open IxExplorer** group, select **Open IxExplorer** to open IxExplorer of the corresponding release.
3. In IxExplorer, open the context menu of the chassis and select **Properties**.



4. On the **Features** tab, type the activation code in the **Feature Activation** box, and then select **Activate** to activate the feature. IxServer searches the chassis for the serial number that is embedded in the activation code and permanently activates the feature on the load module.
5. Select **OK** to save the changes and close the dialog box.

Example: You can upgrade your Xcellon Multis load modules to become 10G capable. For more information, see *IxExplorer User Guide*.

## Turn on mandatory ownership

You can turn on mandatory ownership on a port or a load module to lock it for other users. To turn on mandatory ownership, do the following:

1. Go to **Tools > Options** to open the **Options** dialog box.
2. On the **General** tab, in the **Ownership** group, select **Mandatory Ownership** check box and select **OK**.

**NOTE**

Restart IxServer for Windows chassis to turn on this feature.

In IxExplorer, you must sign in and take ownership before you start using any IxExplorer feature on this port or card. See, IxExplorer Guide for information on taking ownership.

To turn off mandatory ownership, clear the **Mandatory Ownership** check box, select **OK**, and restart IxServer for the change to take effect.

## Disable forcefully taking or clearing ownership

You stop other users from forcefully taking or clearing ownership of a chassis for which you have mandatory ownership. To stop other users from forcefully taking or clearing ownership, do the following:

1. Go to **Tools > Options** to open the **Options** dialog box.
2. On the **General** tab, in the **Ownership** group, select **Disable Forcefully Clear Ownership** check box and select **OK**. This option is not made available by default.

## Clear ownership on disconnect

You can set IxServer to clear your ownership on crash or close. To activate this, do the following:

1. Go to **Tools > Options** to open the **Options** dialog box.
2. On the **General** tab, in the **Ownership** group, select **Clear Ownership on Disconnect** check box and select **OK**.

## Make LLDP protocols available on Ixia port

When an appliance uses IxOS, usually, IxNetwork Port Manager shows the port and the user connected to it. If you make LLDP protocols available on ports, Port Manager will show the system name, system IP, system MAC, port ID, and port speed of the DUT connected to the port.

To make LLDP protocols available on port, do the following:

1. Go to **Tools > Options** to open the **Options** dialog box.
2. On the **General** tab, in the **IxServer Modes** group, select **Enable LLDP protocol on Ixia ports** and select **OK**.

IxServer sends the port information to the IxNetwork Port Manager and you can view the same from the Port Manager.

## Turn on extended capture mode

This option is available only in XGS12 chassis to turn on capture on all eight resource groups of Novus100G load module. After you turn on the capture support for all eight resource groups, IxServer stops and a message appears in the log stating that Capture mode is changed and a restart is needed.

After the capture mode is turned on, it turns off the slots 1, 2, 11, and 12 of the chassis.

To turn on this mode, do the following:

1. Go to **Tools > Options** to open the **Options** dialog box.
2. On the **General** tab, in the **IxServer Modes** group, select **Extended Capture Mode** check box and select **OK**.
3. Restart IxServer.

## Manage event log files

You can control the control the manner in which logging files are created and saved by using the **Event Logging** tab.

To configure the **Event Logging** tab, do the following:

1. Select **Options** in the **Tools** menu in the menu bar. When the **Options** dialog box appears, select the **Event Logging** tab.
2. Select the options you want and select **OK** to save the changes.

### NOTE

You can select **High volume stat requests** and **Polling** to capture additional logging that can help you to identify a problem, if any issue occurs with IxServer. For more information, see [Options: Event Logging tab of Options](#).

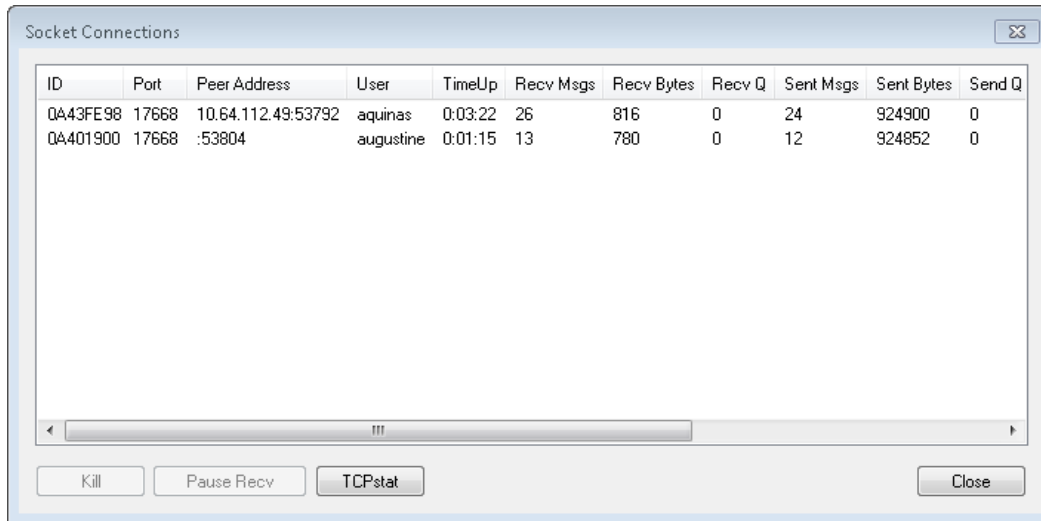
## Collect traces manually from chassis

If you want to collect some traces manually from the chassis, do the following:

1. Go to **Tools > Options** to open the **Options** dialog box.
2. On the **Event Logging** tab, in the **ETW Traces** group, enter a star (\*) and select **Rotate Now** to flush to disk and rotate all the traces.
3. Open a Windows Explorer to locate the trace files for manual retrieval.

## View server statistics

In the **IxServer Diagnostic** dialog box, select **Server Stat** to open the **Socket Connections** dialog box. This dialog box shows various statistics for each client computer connection to the chassis.



## Configure Diagnostics

Diagnostics tests are used to confirm the correct operations on a chassis port. You can turn on or off stats on a port, view the feature capabilities of a port, run memory test, log Mii registers, reboot local CPU, hotswap a port, log PCPU queues, print subscriptions, and many more.

### NOTE

Diagnostics tests are intended for internal use only. We recommend a guided use of these tests.

To configure diagnostic tests, do the following:

1. Open the **Diagnostics** dialog box by selecting **Diagnostics** in the **Tools** menu.
2. Select the options as you require. The required operation is performed as soon as an option is selected. The results of the operation are immediately shown in the IxServer task window.
3. Select **Close** to close the dialog box.

For information on the UI controls of **Diagnostics** dialog box, see [Diagnostics](#).

## View IxServer version

The **About** menu in the menu bar shows the IxServer version number and copyright information.


To view this information, select **Help > About IxServer**. The **About IxServer - Versions** dialog box appears, as shown in the following figure:

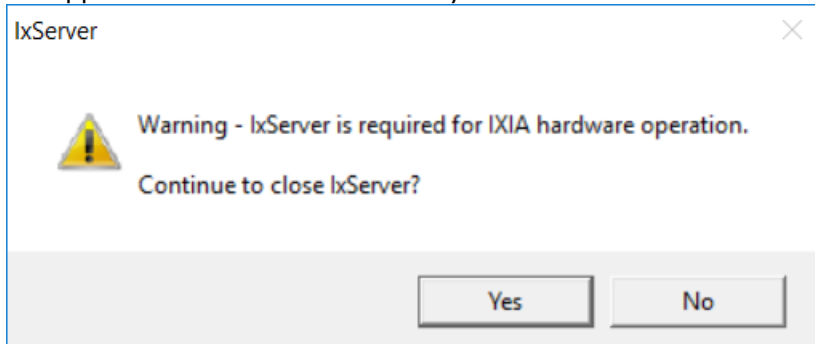


The version number and copyright information are shown in this dialog box. To close the dialog box, select **OK**.

## Stop and exit IxServer

To shut down IxServer, complete one of the following:

- Select **File**, and then select **Exit**.
- Select  in the upper right corner of the main window to shut down IxServer. A warning dialog box appears. Select **Yes** to confirm your action.



## Chapter 5: UI controls

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This section explains the UI controls used in various windows of IxServer.

### Section contents:

<b>IxServer window</b> .....	<b>30</b>
<b>Tools</b> .....	<b>31</b>
<b>Options</b> .....	<b>32</b>
<b>Options: General tab</b> .....	<b>32</b>
<b>Options: Power-up Test tab</b> .....	<b>36</b>
<b>Options: Hardware Parameters tab</b> .....	<b>38</b>
<b>Options: Event Logging tab</b> .....	<b>38</b>
<b>Diagnostics</b> .....	<b>41</b>
<b>Socket Connections</b> .....	<b>42</b>
<b>Secured Mode dialog box</b> .....	<b>43</b>

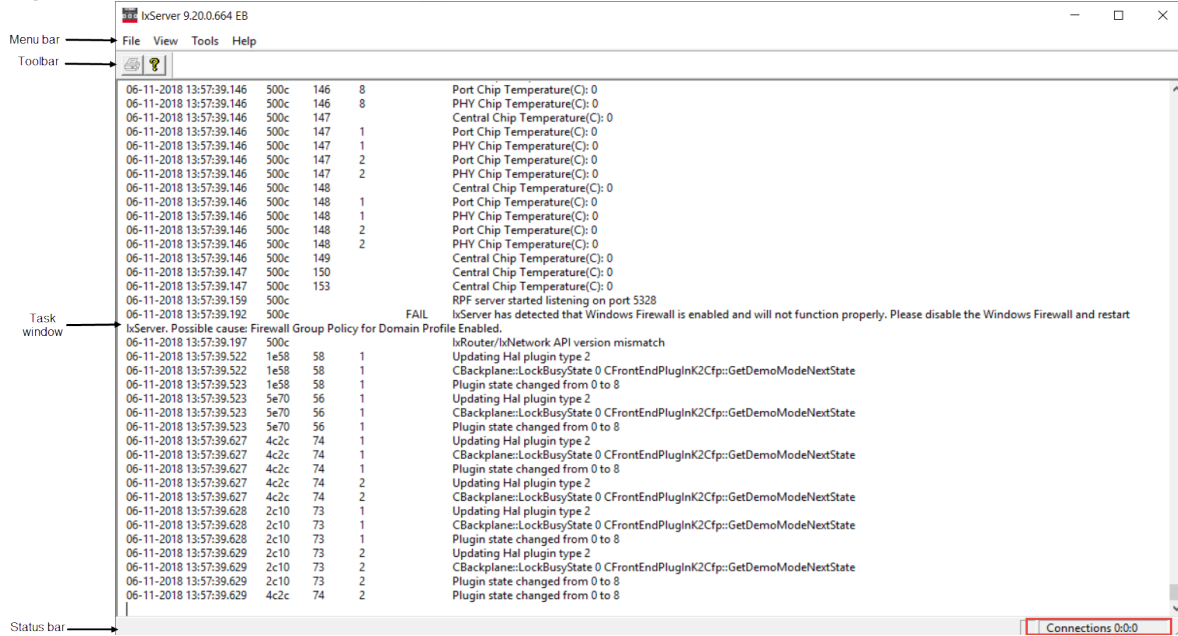


## IxServer window


The IxServer window consists of the following components:


- Menu bar
- Toolbar
- Task window
- Status bar

Figure: IxServer Window



The following table describes the UI controls of the components of IxServer main window:

Field	Usage
Menu Bar	<p>Lists the menu options for the server. These options include the following:</p> <ul style="list-style-type: none"> <li>▪ <b>File:</b> Allows to open the locations of various files and shut down IxServer.</li> <li>▪ <b>View:</b> Allows to modify the view of the IxServer main window, and is described in <a href="#">Modify main window view</a>.</li> <li>▪ <b>Tools:</b> Allows to configure IxServer options, run diagnostic tests, and enter Secure Mode.</li> <li>▪ <b>About:</b> Shows the version number and copyright information for IxServer, and is described in <a href="#">View IxServer version</a>.</li> </ul>
Toolbar	<p>Shows the following options:</p> <ul style="list-style-type: none"> <li>▪ : Allows to print the information in the IxServer Task window.</li> </ul>

Field	Usage
	<ul style="list-style-type: none"> <li>▪ : Allows to access IxServer help.</li> </ul>
Task window	<p>Conveys information on server, diagnostic, and test configurations and operations. The task window shows the operations being performed by the server in real time. Operations include attempts by Keysight clients to sign in to the server, the diagnostic tests of IxServer, and the active tests being run by clients. The server display has following options:</p> <ul style="list-style-type: none"> <li>▪ <b>Date/Time:</b> Shows the date and time a particular server action was logged, in the format <i>mm-dd-yyyyhh:mm:ss</i>. The time (hours, minutes, seconds) is in the 24-hour format.</li> <li>▪ <b>Card:</b> Shows the load module card on which the server action was performed.</li> <li>▪ <b>Port:</b> Shows the card port on which the server action was performed.</li> <li>▪ <b>Result:</b> Shows 'fail' if a start up test or diagnostic operation fails.</li> <li>▪ <b>Event:</b> A description of the server action.</li> </ul>
Status bar and Connections display	<p>Used to convey the status of various server operations. The Status bar <b>Connections</b> entry shows three numbers separated by colons. The first number represents the number of client computer connections, including Tcl clients (Wish, Expect), IxExplorer clients, Stream Statistic Views, Packet Group Statistic Views (IxOS 5.10 and later), or Latency Views (IxOS 5.00 or earlier). The second number represents the number of Stat View 'watch' processes monitoring the chassis, which would include IxExplorer Stat View instances and TCL statWatch objects. The third number is no longer used and should always be zero.</p>

## Tools

There are four options in the **Tools** menu. These are mentioned in the following list:

Tools	Usage
Options	Allows to set set IxServer logging, appearance, sockets used, activate features, and configure the IxServer usage modes including extended capture, diagnostic, and Mandatory Ownership modes. The Options configuration parameters are described in <a href="#">Options</a> .
Diagnostics	Allows to run tests on the chassis and view IxServer connection statistics. Diagnostics options are described in <a href="#">Diagnostics</a> .
Secured Mode	Allows to set authentication requirements for wanting to connect to IxServer. Secured Mode is described in <a href="#">Secured Mode</a> . If Secured Mode is active, Managed Mode is not accessible (disabled).

Tools	Usage
Managed Mode	Allows to access the ports that you can see, own, modify, and use. You can configure user ownership of ports and create groups of users with common restrictions or access. See <a href="#">Managed Mode</a> . If Secured Mode is active, Managed Mode is not accessible (disabled).

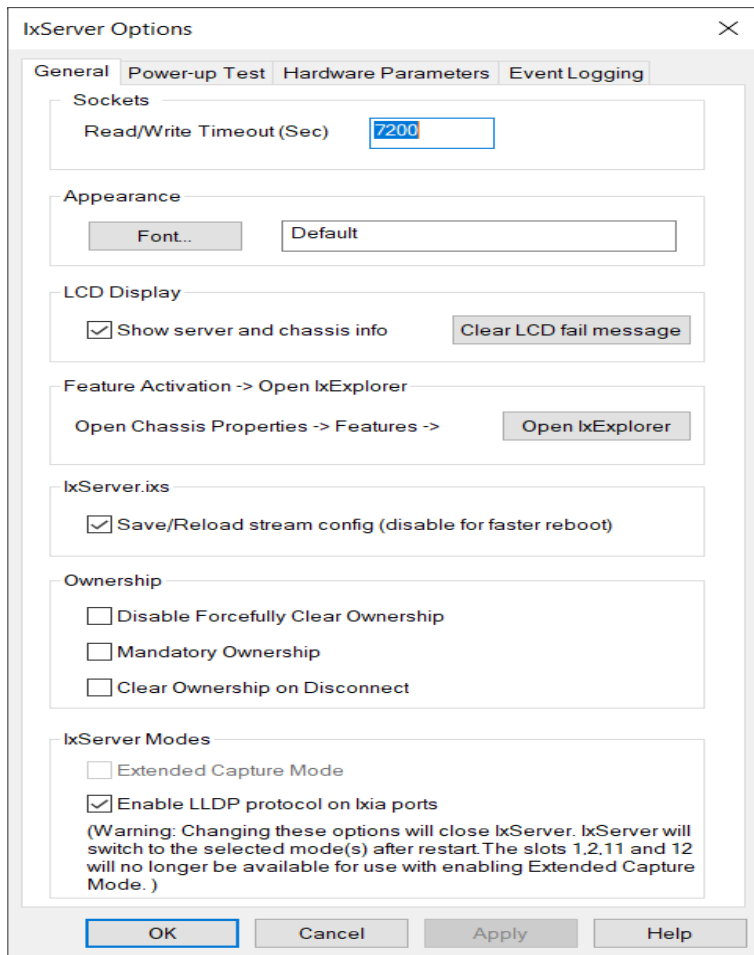
## Options

There are four tabs in the **IxServer Options** dialog box. These tabs are described in the following list:

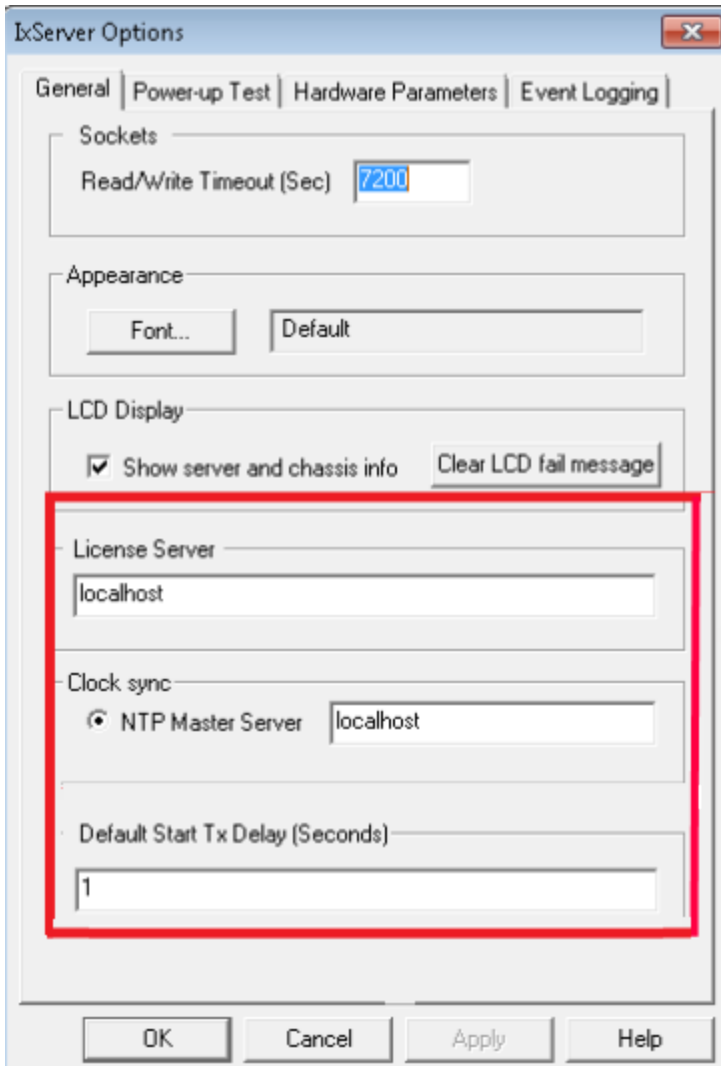
Tabs	Usage
General	Sets the Read/Write timeout and the IxServer main window appearance. This tab is described in <a href="#">General tab</a> .
Power-up Test	Controls the parameters of the test initiated when IxServer is started. This tab is described in <a href="#">Power-up test tab</a> .
Hardware Parameters	Shows the I/O hardware address offset. This tab is described in <a href="#">Hardware Parameters tab</a> .
Event Logging	Controls when to start logging, when to name logging files, and when to generate new files. This tab is described in <a href="#">Event Logging tab</a> .

## Options: General tab

The UI controls of the **General** tab are explained in the following table:



For IxVM load module, the **General** tab is shown in the following figure:



The highlighted box indicates the fields that are available only for IxVM ports.

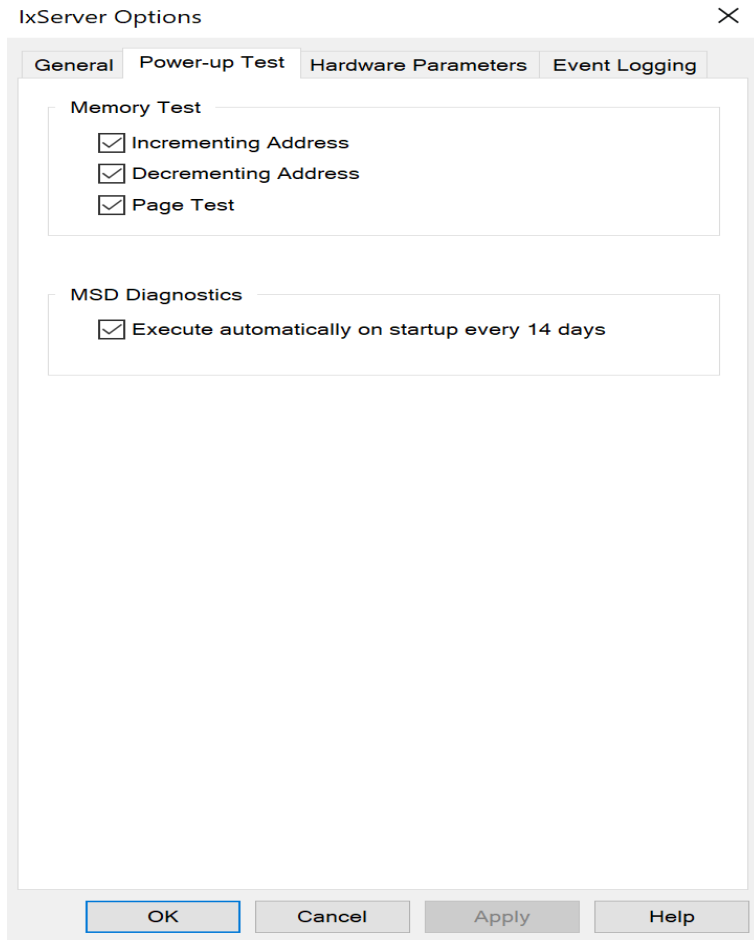
Field	Usage
Read/Write Timeout	Allows to set the IxServer Read/Write timeout, in seconds. Any client computer connection to IxServer that has been inactive for this amount of time is closed.
Appearance	Allows you to change the appearance of the text in the IxServer Task window. To know the steps to change the appearance, see <a href="#">Change IxServer appearance</a> .
Show server and chassis info	Select the check box to show the chassis and server information on the LCD display. If cleared, all the information is hidden from the user. The following possible states for XM2 and XM12 are shown: <ul style="list-style-type: none"> <li>• During Server startup <ul style="list-style-type: none"> <li>▪ Starting up</li> </ul> </li> </ul>

Field	Usage
	<ul style="list-style-type: none"> <li>▪ Power Up</li> <li>▪ PHY link is up/down</li> <li>• When Server is ready               <ul style="list-style-type: none"> <li>▪ Server Ready</li> <li>▪ IxOS Version: &lt;The actual version number&gt;</li> <li>▪ Chassis Name: &lt;The actual name of the chassis&gt;</li> <li>▪ Chassis: &lt; Primary/Secondary&gt;</li> <li>▪ IP Address: &lt;The actual IP address of the chassis or 'Unknown IP'&gt;</li> <li>▪ Chassis Number: &lt;The id number of the chassis (1/2/3)&gt;</li> <li>▪ Server &lt;FAIL/OK&gt;</li> <li>▪ ScrollerCoreErr</li> </ul> </li> <li>• During Server shutdown               <ul style="list-style-type: none"> <li>▪ Server Stopped</li> </ul> </li> </ul>
Clear LCD fail message	Clears the failure notification shown on the physical chassis LCD in case an error occurs, provided the chassis has an LCD display.
Feature Activation -> Open IxExplorer	Feature Activation can perform a field upgrade of a load module. To know the steps to activate a feature, see <a href="#">Activate feature</a> .
Save/Reload stream config (disable for faster reboot)	<p>By default, the <b>Save/Reload stream config (disable for faster reboot)</b> check box is selected.</p> <p>When you clear the check box, a part of the information in IxServer.ixs (the stream config) will not be loaded, in order to boot up IxServer faster.</p> <p>For VM ports, the check box is not visible in the IxExplorer GUI.</p> <p><b>NOTE</b> IxServer.ixs file is always loaded on IxServer startup.</p>
License Server	<p>The name of the external IxVM license server for server licenses.</p> <p><b>NOTE</b> This field is available for only available only for IxVM ports.</p>
NTP Master Server	<p>Represents the IP/hostname of the NTP server that the IxVM cards synchronizes their time to. If you are running traffic from IxVM ports from multiple chassis, the NTP Master Server needs to be the same on all the chassis.</p> <p><b>NOTE</b> This field is available for only available only for IxVM ports.</p>
Default Start Tx Delay (Seconds)	<p>Delays the start of the scheduled stream by the number you enter in seconds.</p> <p><b>NOTE</b> This field is available for only available only for IxVM ports.</p>

Field	Usage
Disable Forcefully Clear Ownership	When you select <b>Disable Forcefully Clear Ownership</b> check box, users cannot forcefully clear or take ownership. This option is not made available by default.
Mandatory Ownership	After you select this check box, the port or card will be locked for other users. In IxExplorer, you must sign in and take ownership before you start using any IxExplorer feature on this port or card. See, IxExplorer Guide for information on To know the steps to take ownership, see <a href="#">Turn on mandatory ownership</a> .
Clear Ownership on Disconnect	After you select this check box, if IxServer crashes or closes abruptly, your ownership on the load module will clear.
Extended Capture Mode	After you turn on the capture support for all 8 RGs of a Novus100G LM by selecting this check box. IxServer stops and a message appears in the log stating that Capture mode is changed and a restart is needed.  This option is seen only in XGS-12 chassis. After it is turned on, it turns off the slots 1, 2, 11, and 12 of the chassis.

## Options: Power-up Test tab

The following table describes the UI controls of the **Power-up Test** tab:



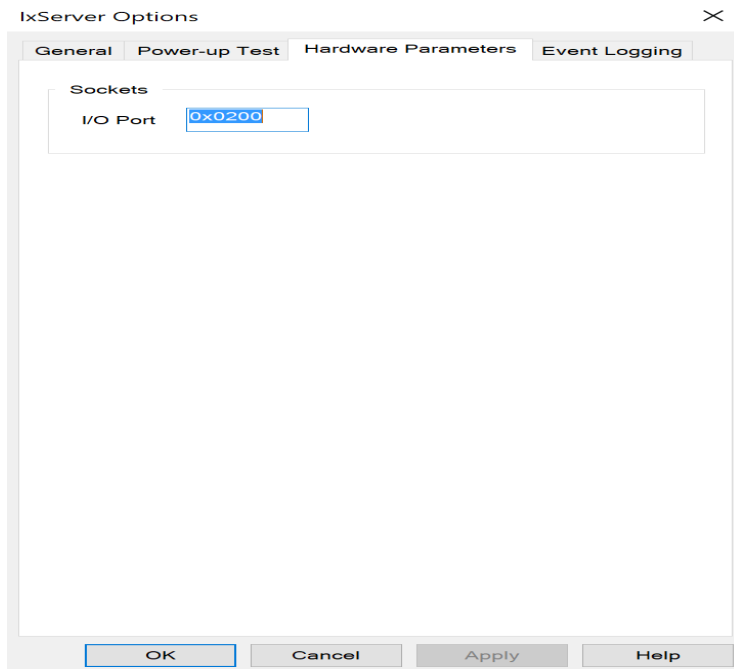
Test	Field	Usage
Memory Test		A memory test runs a check of the load module memory, used for background data, capture buffer, overlay data, and so forth. The test writes read patterns to the RAM and verifies that it can hold the data.
	Incrementing Address	Selecting this option increments the value of the data written during a memory test.
	Decrementing Address	Selecting this option decrements the value of the data written during a memory test.
	Page Test	Selecting this option verifies that each page of memory can be written in increments of 64 KB.
MSD Diagnostics		Hardware tests that IxServer runs on each load module to ensure the hardware is not faulty.
	Execute automatically on	Selecting this option runs MSD tests automatically every 14 days on startup of a card.



Test	Field	Usage
	startup every 14 days	

## Options: Hardware Parameters tab

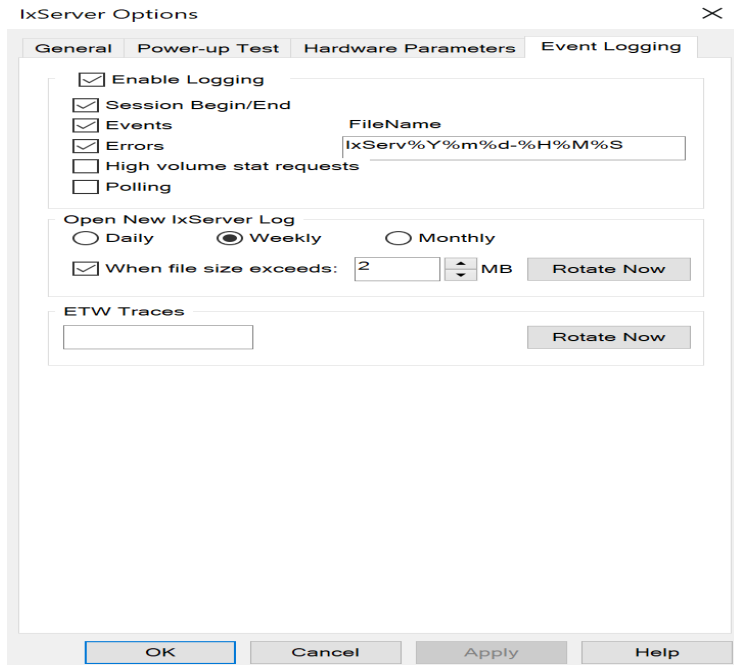
The following table describes the UI controls of the **Hardware Parameters** tab:



Field	Usage
I/O Port	Shows the input/output hardware offset address of the chassis, in hexadecimal format. Different chassis have different offsets. The offset must be added to registers (that is, a card register at 100 hex) to correctly identify the register address.

## Options: Event Logging tab

The **Event Logging** tab is used to control the manner in which logging files are created and saved.



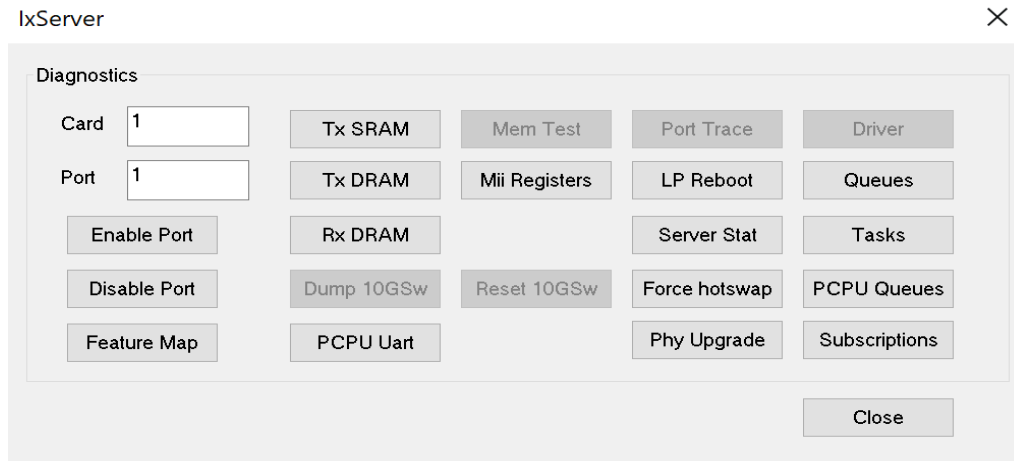
The following table describes the UI controls of the **Event Logging** tab:

Group	Field	Usage
Enable Logging		If selected, starts an event.
	Session Begin/End	If selected, the start and stop time of each client session is logged.
	Events	If selected, enables logging of events.
	Errors	If selected, enables logging of errors.
	High volume stat requests	If selected, enables logging of high volume statistics requests. This is mainly used for investigation purposes. If an issue occurs with IxServer, more logging will be added in the IxServer log that can help you to identify the problem.
	Polling	If selected, additional logging for periodic operations are added.
File Name Format		Indicates the name under which the various log and csv files are kept. The event files are logged into the same folder in which the IxExplorer was loaded (usually c:\Program Files\Ixia\IxOS\version X). The name may contain any of the following character sequences, which are substituted with actual values when each log file or csv file is created:

Group	Field	Usage
		<ul style="list-style-type: none"> <li>• %Y: The four digit year number. For example, <i>2008</i>.</li> <li>• %m: The two digit month number. For example, <i>01</i> for January.</li> <li>• %d: The two digit day number within the month.</li> <li>• %a: The abbreviated weekday name.</li> <li>• %A: The full weekday name.</li> <li>• %b: The abbreviated month name.</li> <li>• %B: The full month name.</li> <li>• %c: The date and time appropriate for the locale.</li> <li>• %H: The hour in 24-hour format.</li> <li>• %I: The hour in 12-hour format.</li> <li>• %j: The day of the year as a decimal number.</li> <li>• %M: The minute as a decimal number.</li> <li>• %p: The AM/PM indicator.</li> <li>• %S: The second as a decimal number.</li> <li>• %U: The week of the year as a decimal number.</li> <li>• %w: The weekday as a decimal number.</li> <li>• %W: The week of the year as a decimal number.</li> <li>• %x: The date representation for the current locale.</li> <li>• %y: The two digit year number. For example, <i>99</i>.</li> <li>• %z,%Z: The time-zone name or abbreviation.</li> <li>• %%: The percent sign.</li> </ul>
Open New Log		This group of options controls when a new log file is created.
	Daily/Weekly/Monthly	A new log is started on a daily, weekly, or monthly basis, depending on the selection.
	When file size exceeds _ _ MB	If this is selected, a new log is also started when the size of a log file exceeds a specified size.
ETW Traces		Event Tracing for Windows (ETW) is an advanced method of collecting tracing information for diagnostics purposes. Traces are automatically rotated as necessary, for example, when diagnostics collection is invoked from IxExplorer. To collect traces manually from the chassis, see <a href="#">Collect traces manually from chassis</a> .

## Diagnostics

As soon as you select an option in this dialog box, IxServer performs the action and shows the result in the **IxServer Task** window.



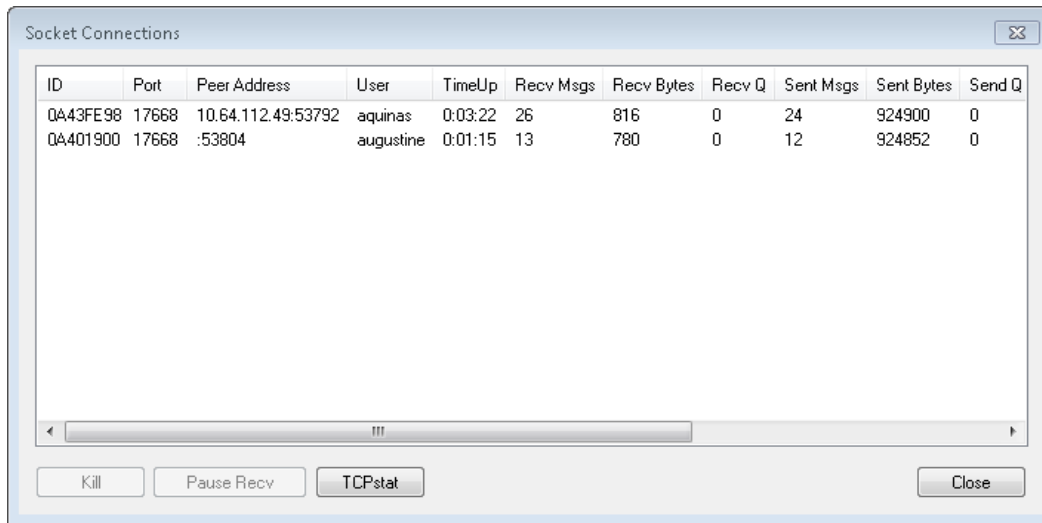
The following table describes the UI controls of the **Diagnostics** dialog box:

Field	Usage
Card	The load module card number in the chassis on which a selected test is to be performed.
Port	The port number of the load module on which a selected test is to be performed.
Enable Port	Turn on stats on port.
Disable port	Turn off stats on port.
Feature map	This shows the list feature capabilities available on port and shows its status.
TxSRAM	Dumps the contents of the transmit SRAM cache for the selected port to the IxServer Task window.
TxDRAM	Dumps the contents of the transmit DRAM cache for the selected port to the IxServer Task window.
RxDRAM	Dumps the contents of the receive DRAM cache for the selected port to the IxServer Task window.
Dump 10GSw	Dumps the statistics for the TenSpeed switch, if equipped.
PCPU Uart	Dumps memuart for the selected port/PCPU to the IxServer task window.
Mem Test	Performs a memory test for the selected card (across the whole chassis when card is zero).
Mii Registers	Selecting this option causes IxServer to read the configured Media Independent

Field	Usage
	Interface (Mii) settings for the selected port.
Reset 10GSW	Resets the TenSpeed Switch if equipped. This may temporarily disrupt communication to/from any TEC-based load module, so use with caution.
Port Trace	(No longer supported)
LP Reboot	Restarts the selected port CPU, and reloads the firmware.
Server Stat	Shows the server statistics in the <b>Socket Connections</b> dialog box, explained in <a href="#">View server statistics</a> .
Force hotswap	Performs a hotswap for the selected card; use only if no users are connected. Normal users should prefer to use IxExplorer.
Phy Upgrade	Forces the Gennum EEPROM download for the selected port, if equipped.
Queues	Shows information about some internal queues. Queues dumps the state for the entire chassis (ignoring the card/port selectors).
Tasks	Lists all the tasks for the entire chassis (ignoring the card/port selectors).
PCPU Queues	Dumps raw contents of the selected PCPU queue.
Subscriptions	Dumps the internal state of the Publish/Subscribe subsystem. This shows the subscriptions for notifications in the IxServer task window.

## Socket Connections

From the **Socket Connections** dialog box, you can view the server statistics.



The following table describes the UI controls of the **Socket Connections** dialog box:

Field	Description
ID	A generated ID number for the connection.
Port	The socket port being used for the user connection.
Peer Address	The IP address and TCP port of the session client.
User	The user name of the client computer, if the users have signed in.
TimeUp	The length in time the connection has been linked to IxServer. The format is <i>hh:mm:ss</i> .
Recv Msgs	The number of messages received from the client computer side of this connection.
Recv Bytes	The number of bytes received from the client computer side of this connection.
Recv Q	The socket connection receive queue size, in bytes.
Send Msgs	The number of messages sent to the client computer side of this connection.
Send Bytes	The number of bytes sent to the client computer side of this connection.
Send Q	The socket connection send queue size, in bytes.
Requests	The number of requests received from the client computer side of this connection.
Replies	The number of replies sent to the client computer side of this connection.
Foreign Requests	The number of unknown requests received from the client computer side of this connection.
Sndr State	The current state of the packet sender. Either up or down.
Rcvr State	The current state of the packet receiver. Either up or down.
Kill	Selecting this option terminates a highlighted connection.

## Secured Mode dialog box

The following table describes the UI controls of the **Secured Mode** dialog box:

Field	Usage
Administrator name	The alphanumeric user name of the Administrator. This name is the only one that is accepted by the log on prompt when attempting to access the chassis from IxExplorer.
Password	A password associated with the Administrator name. The characters entered are hidden by asterisk (*).

<b>Field</b>	<b>Usage</b>
Confirm Password	A confirmation of the password entered in the preceding field. The characters entered are hidden by asterisk (*).

## Chapter 6: Load modules eligible for Trade-in program

The following load modules that have reached end of life (EOL) or end of sale (EOS) are eligible for the Trade-in program:

- Xcellon-FlexFE10G16S
- Xcellon-FlexAP10G16
- LSM10GXM8S-01
- LSM10GXM8XP-01
- LSM10GXM8-01
- LSM1000XMVDC16-01
- LSM1000XMV16-01

### NOTE

You can upgrade from existing legacy load modules to NOVUS 1G/10G by using the Trade-in program.

To check the eligibility for trade-in of a load module see the Trade-in portal: <https://support.ixiacom.com/trade-in/check>.

If you have opted for a trade-in of any load module but have not returned or scrapped the load module within ninety days of shipment of the newly purchased load module, the trade-in product is deactivated, and all Keysight support obligations terminated. The serial numbers of such load modules are added to the EOL list.

If a load module present in the current chassis, is included in the EOL list, on server boot up a message appears in IxServer logs.

An example of such message is as follows:

```
03-16-2017 12:33:11.265      09a0      11      Alert      Removing Load
Module with serial '082848' part number '860-1229-15' as it has been
deactivated according to the Ixia trade-up program.
```



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## Chapter 7: Metronome Time Synchronization

Metronome provides time synchronization of independent Keysight chassis and chassis chains located anywhere in the world from multiple external time delivery sources.

When chassis are linked together into a chassis chain by sync cables, the time source selected for the primary in the chain is the basis for the timing of ALL chassis in that chain. Any time source selected for an individual secondary chassis is overridden by the timing supplied from the primary chassis.

Metronome is used with the XGS2-SD, XGS2-HS, XGS12-SD and XGS12-HS chassis and the AresONE fixed form factor chassis. Every metronome in the system can provide timing and triggers to eight chassis.

IxServer logs detects the Metronome timing source and contains the entries for the primary chassis as shown in the following figure:

```
05-25-2021 14:00:47.433 f16feb40 Ixia Metronome timing system detected.
05-25-2021 14:00:47.433 f13fbb40 Completed handshake configuration with Metronome at address: 10.215.120.241
05-25-2021 14:00:47.433 f1d04b40 Metronome authorization token is set to: 03683ba9-0a63-4659-a13f-f296b2871c6b
05-25-2021 14:00:47.444 f11f9b40 Metronome chassis number is set to: 0
05-25-2021 14:00:47.444 f10f8b40 Metronome version in: main. Build number is: 230.9101641
05-25-2021 14:00:47.450 f4567b40 Chassis is primary
05-25-2021 14:00:47.450 f4567b40 Clock detection complete. You can now start IxServer on the next chassis in the chain
```

If IxServer does not detect Metronome, the logs will not contain the entries for the primary chassis as shown in the previous image. Instead, IxServer will show legacy chassis chain information.

IxServer logs detects the Metronome timing source and contains the entries for the secondary chassis as shown in the following figure:

```
05-25-2021 14:00:47.433 f16feb40 Ixia Metronome timing system detected.
05-25-2021 14:00:47.433 f13fbb40 Completed handshake configuration with Metronome at address: 10.215.120.241
05-25-2021 14:00:47.433 f1d04b40 Metronome authorization token is set to: 03683ba9-0a63-4659-a13f-f296b2871c6b
05-25-2021 14:00:47.444 f11f9b40 Metronome chassis number is set to: 0
05-25-2021 14:00:47.444 f10f8b40 Metronome version in: main. Build number is: 230.9101641
05-25-2021 14:00:47.450 f4567b40 Chassis is secondary
05-25-2021 14:00:47.450 f4567b40 Clock detection complete. You can now start IxServer on the next chassis in the chain
```

If IxServer does not detect Metronome, the logs will not contain the entries for the secondary chassis as shown in the previous image. Instead, IxServer will show legacy chassis chain information.

For more information on chassis chain timing specifications, see *Platform Reference Guide*.

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## Appendix A: Load Modules not supporting High Performance mode

The following Load Modules that are End-Of-Development starting from IxOS 9.00 are not supported in High Performance Mode:

Load Module Name
EIM10G4S
EIM1G4S
EIM40G2Q
HSE40/100GETSP1-01
HSE40/100GETSPR1-01 40/100 GE Data Plane Only
HSE40GEQSFP1-01 (EOL 12/20/2019)
HSE40GETSP1-01 (EOL 11/5/2017)
LM1000STX4 (EOL 11/5/2017)
LM1000STXR4 (11/05/2017) (CHINAPL)
LM1000STXS4-256
LM622MR (EOL 11/05/2017)
LM622MR-512
LSM1000XMVR12-01
LSM1000XMVR4-01
LSM1000XMVR8-01
LSM10G1-01
LSM10GR1-01 (EOL 1/1/2018)(CHINAPL)
LSM10GXM2GBT-02

<b>Load Module Name</b>
LSM10GXM2NG-01 NGY - Fusion Enabled
LSM10GXM2XP-01
LSM10GXM4GBT-02
LSM10GXM4NG-01 NGY Fusion Enabled
LSM10GXM4XP-01
LSM10GXM8NG-01 NGY Fusion Enabled
LSM10GXM8XP-01
LSM10GXMR2GBT-02
LSM10GXMR4GBT-02
LSM10GXMR8GBT-02
MSM2.5G1-01
FCMGXM4S-01
FCMGXM8S-01
Xdensity XDM10G32S
XDENSITY,XDM10G8S,10GBE,8-PORTS,SFP+,LOAD MODULE

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