Brocade NetIron

Software Licensing Guide

Supporting Multi-Service Ironware R05.8.00a

BROCADE®

Contents

Preface

Document conventions

The document conventions describe text formatting conventions, command syntax conventions, and important notice formats used in Brocade technical documentation.

Text formatting conventions

Text formatting conventions such as boldface, italic, or Courier font may be used in the flow of the text to highlight specific words or phrases.

Format	Description
bold text	Identifies command names
	Identifies keywords and operands
	Identifies the names of user-manipulated GUI elements
	Identifies text to enter at the GUI
italic text	Identifies emphasis
	Identifies variables
	Identifies document titles
`Courier font`	Identifies CLI output
	Identifies command syntax examples

Command syntax conventions

Bold and italic text identify command syntax components. Delimiters and operators define groupings of parameters and their logical relationships.

Convention	Description
bold text	Identifies command names, keywords, and command options.
italic text	Identifies a variable.
value	In Fibre Channel products, a fixed value provided as input to a command option is printed in plain text, for example, **--show** WWN.

Convention	Description
[ ]	Syntax components displayed within square brackets are optional.
	Default responses to system prompts are enclosed in square brackets.
{ x | y | z }	A choice of required parameters is enclosed in curly brackets separated by vertical bars. You must select one of the options.
	In Fibre Channel products, square brackets may be used instead for this purpose.
x | y	A vertical bar separates mutually exclusive elements.
< >	Nonprinting characters, for example, passwords, are enclosed in angle brackets.
...	Repeat the previous element, for example, *member*[*member*...].
\	Indicates a "soft" line break in command examples. If a backslash separates two lines of a command input, enter the entire command at the prompt without the backslash.

Notes, cautions, and warnings

Notes, cautions, and warning statements may be used in this document. They are listed in the order of increasing severity of potential hazards.

NOTE
A Note provides a tip, guidance, or advice, emphasizes important information, or provides a reference to related information.

ATTENTION
An Attention statement indicates a stronger note, for example, to alert you when traffic might be interrupted or the device might reboot.

CAUTION
A Caution statement alerts you to situations that can be potentially hazardous to you or cause damage to hardware, firmware, software, or data.

DANGER
A Danger statement indicates conditions or situations that can be potentially lethal or extremely hazardous to you. Safety labels are also attached directly to products to warn of these conditions or situations.

Brocade resources

Visit the Brocade website to locate related documentation for your product and additional Brocade resources.

You can download additional publications supporting your product at www.brocade.com. Select the Brocade Products tab to locate your product, then click the Brocade product name or image to open the individual product page. The user manuals are available in the resources module at the bottom of the page under the Documentation category.

To get up-to-the-minute information on Brocade products and resources, go to MyBrocade. You can register at no cost to obtain a user ID and password.

Release notes are available on MyBrocade under Product Downloads.

White papers, online demonstrations, and data sheets are available through the Brocade website.

Contacting Brocade Technical Support

As a Brocade customer, you can contact Brocade Technical Support 24x7 online, by telephone, or by e-mail. Brocade OEM customers contact their OEM/Solutions provider.

Brocade customers

For product support information and the latest information on contacting the Technical Assistance Center, go to http://www.brocade.com/services-support/index.html.

If you have purchased Brocade product support directly from Brocade, use one of the following methods to contact the Brocade Technical Assistance Center 24x7.

Online	Telephone	E-mail
Preferred method of contact for non-urgent issues: • My Cases through MyBrocade • Software downloads and licensing tools • Knowledge Base	Required for Sev 1-Critical and Sev 2-High issues: • Continental US: 1-800-752-8061 • Europe, Middle East, Africa, and Asia Pacific: +800-AT FIBREE (+800 28 34 27 33) • For areas unable to access toll free number: +1-408-333-6061 • Toll-free numbers are available in many countries.	support@brocade.com Please include: • Problem summary • Serial number • Installation details • Environment description

Brocade OEM customers

If you have purchased Brocade product support from a Brocade OEM/Solution Provider, contact your OEM/Solution Provider for all of your product support needs.

• OEM/Solution Providers are trained and certified by Brocade to support Brocade® products.
• Brocade provides backline support for issues that cannot be resolved by the OEM/Solution Provider.

- Brocade Supplemental Support augments your existing OEM support contract, providing direct access to Brocade expertise. For more information, contact Brocade or your OEM.
- For questions regarding service levels and response times, contact your OEM/Solution Provider.

Document feedback

To send feedback and report errors in the documentation you can use the feedback form posted with the document or you can e-mail the documentation team.

Quality is our first concern at Brocade and we have made every effort to ensure the accuracy and completeness of this document. However, if you find an error or an omission, or you think that a topic needs further development, we want to hear from you. You can provide feedback in two ways:

- Through the online feedback form in the HTML documents posted on www.brocade.com.
- By sending your feedback to documentation@brocade.com.

Provide the publication title, part number, and as much detail as possible, including the topic heading and page number if applicable, as well as your suggestions for improvement.

Software Licensing Overview

The table below lists the individual Brocade NetIron devices and the software licensing features they support.

TABLE 1   Supported software licensing features

Features supported	NetIron XMR Series	NetIron MLX Series	NetIron CES 2000 Series BASE package	NetIron CES 2000 Series ME_PREM package	NetIron CES 2000 Series L3_PREM package	CER 2000 Series BASE package	CER 2000 Series Advanced Services package
Software-based licensing	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Port based-licensing	Yes	Yes	No	No	No	No	No
License generation	Yes	Yes	Yes	Yes	Yes	Yes	Yes
License query	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deleting a license	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Software-based licensing overview

Prior to the introduction of software-based licensing, Brocade supported *hardware-based licensing* , where an EEPROM was used to upgrade to a premium set of features. With the introduction of *software-based licensing* , one or more valid software licenses are required to run such *licensed features* on the device.

Software-based licensing is designed to work together with hardware-based licensing. The first release of software-based licensing employs a combination of hardware-based and software-based licensing. A Brocade device can use hardware-based licensing, software-based licensing, or both. Future releases that support software-based licensing will use software-based licensing only, eliminating the need for a customer- or factory-installed EEPROM on the management module or switch backplane.

Software-based licensing provides increased scalability and rapid deployment of hardware and software features on the supported Brocade family of switches. For example, for premium upgrades, it is no longer necessary to physically open the chassis and install an EEPROM to upgrade the system. Instead, the Web is used to generate, download, and install a software license that will enable premium features on the device.

How software-based licensing works

A permanent license can be ordered pre-installed in a Brocade device when first shipped from the factory, or later ordered and installed by the customer. In either case, additional licenses can be ordered as needed.

When a license is ordered separately (not pre-installed), an *entitlement certificate* or e-mail, containing a *transaction key* , is issued to the customer by Brocade as proof of purchase. The *transaction key* and license ID (*LID)* of the Brocade device are used to generate a license key from the Brocade software licensing portal. The license key is contained within a *license file* , which is downloaded to the customer's PC, where the file can then be transferred to a TFTP or SCP server, and then uploaded to the Brocade device.

Once a license is installed on the Brocade device, it has the following effect:

- The license unlocks the licensed feature and the feature becomes available immediately. There is no need to reload the software.
- When a trial license expires, the commands and CLI related to the feature are disabled, but the feature itself cannot be disabled until the system reloads.

Seamless transition for legacy devices

In this chapter, the term "legacy device" refers to a Brocade device that was shipped prior to the introduction of software-based licensing, has an EEPROM installed, and is running a software release prior to the Brocade NetIron release 05.0.00.

The transition to software-based licensing is seamless for legacy devices. When upgraded to a release that supports software-based licensing, these devices will continue to operate as previously configured.

Though not mandatory, Brocade recommends that once a legacy device is upgraded to a release that supports software-based licensing, the device should be registered. This will enable Brocade to track the device in case service is needed. To register the device, refer to the instructions in Seamless transition for legacy devices.

NOTE
There are special considerations and instructions for legacy NetIron devices in need of replacement (via a Return Merchandise Agreement (RMA)). For details, refer to Seamless transition for legacy devices.

License types

The following license types are supported:

- NetIron CES Series license types:

    - NI-CES-2024-MEU - Enables Metro Edge Premium upgrade for NetIron CES 2000 Series 24-port models.
    - NI-CES-2024-L3U - Enables Layer 3 Premium upgrade for NetIron CES 2000 Series 24-port models.
    - NI-CES-2048-MEU - Enables Metro Edge Premium upgrade for NetIron CES 2000 Series 48-port models.
    - NI-CES-2048-L3U - Enables Layer 3 Premium upgrade for NetIron CES 2000 Series 48-port models.
- NetIron CER Series license types:

Licensing rules

The following licensing rules apply to all Brocade NetIron devices that support software licensing:

- A license is tied to the unique LID of the fixed configuration switch for which the license was ordered. Therefore, a license can be used on one particular device only. It cannot be used on any other device.
- More than one license can be installed per device concurrently.
- More than one trial license can be in effect at the same time, as long as each trial license applies to a unique licensed feature.
- A trial license cannot replace or supersede a normal license.

Obtaining a license

Complete the following steps to generate and obtain a software license.

1. Order a license for the desired licensed feature. Refer to Obtaining a license and Obtaining a license for a list of valid part numbers and licensed features.

NOTE
To order and obtain a *trial license*, contact your Brocade representative.

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2. Obtain the license ID (LID):

- - You can obtain the LID from the IUID label on the unit.
    - Once you receive the paper-pack or electronic transaction key, you can retrieve the LID of your Brocade device by entering the **show version** command on the device. Example command output is shown in Obtaining a license."If you received a paper-pack transaction key, write the LID in the space provided on the entitlement certificate.

NOTE
Do not discard the entitlement certificate or e-mail with the electronic key. Keep it in a safe place in case it is needed for technical support or product replacement (RMAs).

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3. Log in to the Brocade software portal at http://swportal.brocade.com and complete the software license request. If you do not have a login ID and password, request access by following the instructions on the screen.

   The image below shows the Brocade **Software Portal Login** window.

FIGURE 1 Brocade Software Portal Login window

4. Obtaining a license shows the **License Management Welcome** window that appears after logging in to the Brocade software portal. **Select License Management > Brocade IP/Ethernet > License Generation with Transaction key.**

FIGURE 2 A License Management Welcome window
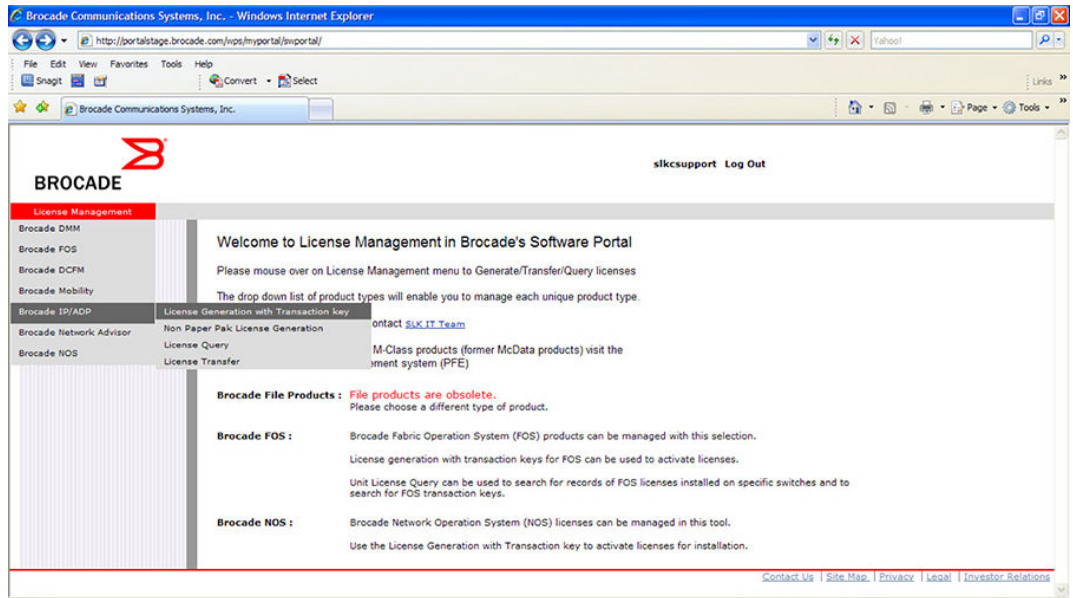
The image below shows the **IP/Ethernet License Generation** window for generating a license using a transaction key and LID.

FIGURE 3 IP/ Ethernet License Generation window
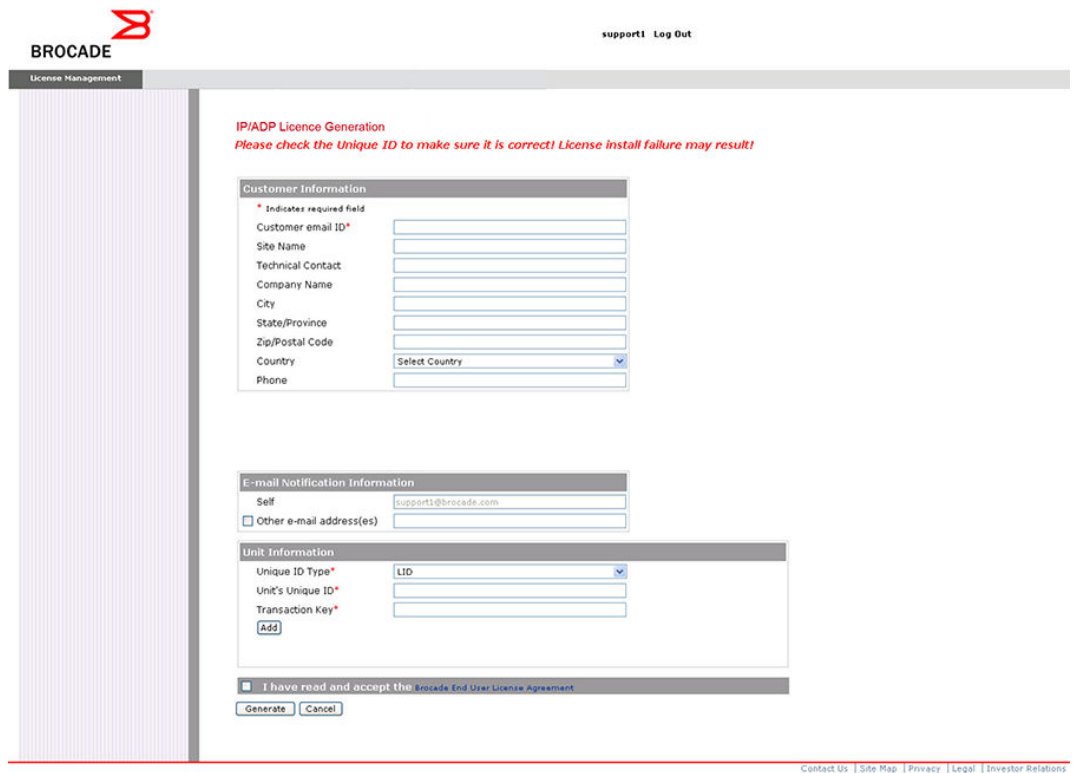
5.

6. Enter the required information in each field the **IP/Ethernet License Generation** window.

   • For a description of the field, pause the pointer over the field.
   • An asterisk next to a field indicates that the information is required.

   You can generate more than one license at a time. For each license request, enter the unit information (unit ID and transaction key) and click the **Add** button.

   When you have finished entering the required information, read the Brocade End User License Agreement, and then select the check box to indicate that you have read and accepted the agreement.

   Press the **Generate** button to generate the license. The image below shows the results window, which displays an order summary and the results of the license request.

   • -   If the license request was successful, the **Status** field will indicate **"Success"** and the **License File** field will contain a hyperlink to the generated license file. The license file will also be automatically e-mailed to the specified customer e-mail ID.
     -   If the license request failed, the **Status** field will indicate the reason it failed and the action to be taken.

FIGURE 4 IP/Ethernet License Generation Results window

7. Download the license file to your PC by either clicking on the hyperlink or saving it from the e-mail attachment.
8. Upload the license file to the Brocade device as instructed in the Obtaining a license.

Viewing software license information

You can use the **License Query** option to view software license information for a particular unit, transaction key, or both. You can export the report to Excel for sharing or archiving purposes.

Depending on the status of the license, for example, whether or not the license was generated, the report will include the following Information:

• Hardware part number, serial number, and description
• Software part number, serial number, and description
• Date the license was installed

- Transaction key
- LID
- Feature name
- Product line

To access the License Query option, from the **License Management Welcome** window, select **License Management > Brocade IP/Ethernet > License Query**.

The image below shows the **License Query** window.

FIGURE 5 License Query window
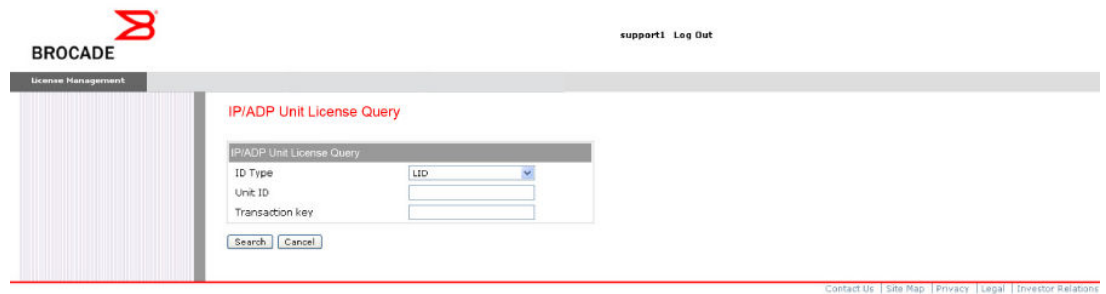
- To view software license information for a particular unit, enter the LID in the **Unit ID** field and click **Search**.
- To view software license information for a particular transaction key, enter the unique number in the **Transaction key** field and click **Search**.

NOTE
The transaction keys that have not been activated will not be found in the portal.

The image below shows an example of the license query results.

FIGURE 6 License Query results window
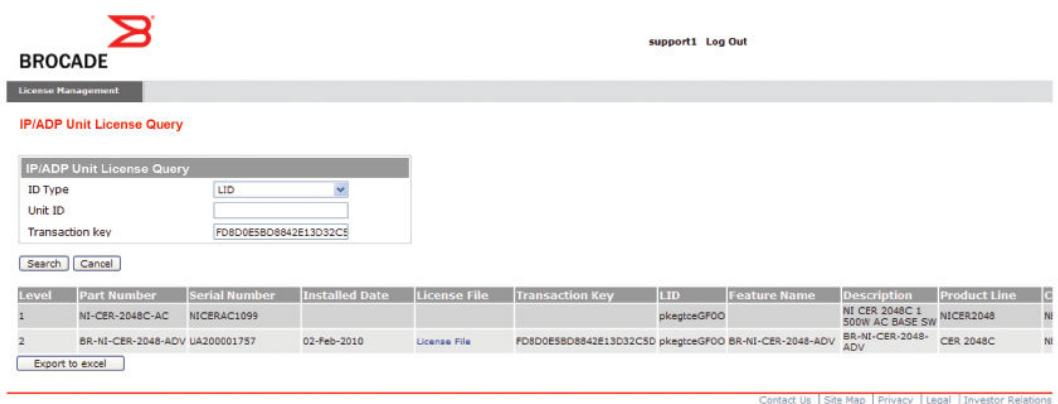
In this example, the line items for **Level 1** display hardware-related information and the line items for **Level 2** display software-related information. If the query was performed before the transaction key was generated, the first row (**Level 1**) would not appear as part of the search results. Similarly, if the query was performed before the license was generated, some of the information in the second row would not be displayed.

Software Licensing Tasks

This chapter describes the configuration tasks for generating and obtaining a software license and installing the license on the Brocade device.

Configuration tasks

Perform the tasks in the order listed in Table 2 to configure software licensing.

TABLE 2   Configuration tasks for software licensing

Configuration task	Available information
1 Order the desired license.	For a list of available licenses and associated part numbers, refer to Configuration tasks.
2 Retrieve the LID of the Brocade device. If you received the transaction key via paper-pack, record the LID on the entitlement certificate in the space provided.	Viewing the license on page 21
3 Log in to the Brocade software portal to generate and obtain the license file.	Configuration tasks
4 Upload the license file to the Brocade device.	Configuration tasks
5 Verify that the license is installed.	Verifying the license file installation on page 18

Installing a license file

Once you obtain a license file, place it on a TFTP or SCP server to which the Brocade device has access, and then use TFTP or SCP to copy the file to the license database of the Brocade device.

Using TFTP to install a license file

To copy a license file from a TFTP server to the license database of the Brocade device, enter a command such as the following at the privileged EXEC level of the CLI.

```
device# copy tftp license 10.1.1.1 lic.xml
```

Syntax: copy tftp license *IP_address license_filename_on_host*

The *IP_address variable* is the address of the IPv4 TFTP server.

The *license_filename_on_host* is the file name of the license file.

Using Secure Copy to install a license

SSH and Secure Copy (SCP) must be enabled on the Brocade device before the following procedure in this section can be performed.

To copy a license file from an SCP-enabled client to the license database of the Brocade device, enter a command such as the following on the SCP-enabled client.

```
c:\scp c:\license\license101 terry@10.1.1.1:license
```

Syntax: scp *license_file_on_host user* **@** *IP_address* **:license**

The *license_file_on_host* is the file name of the license file.

The *IP_address variable* is the address of the IPv4 TFTP server.

The *user variable* is the user name.

Verifying the license file installation

Use the **show license** command to verify that the license is installed on the device. Details about this command are in the .

Using a trial license

NOTE
A trial license must be ordered and installed by a Brocade representative.

A trial license enables demonstration and evaluation of a licensed feature and can be valid for a period of up to 45 days. A licensed feature operating under a trial license has the same functionality (CLI and show commands) as does a licensed feature operating under a normal license.

What happens when a trial license expires

A trial license expires when it exceeds the specified expiration time or date. The countdown starts when the trial license is generated. When the license expires, the licensed feature will continue to run as configured until the system is reloaded. When the system is reloaded, the CLI commands related to the licensed feature will no longer be available.

If a second trial license is installed after the first license expires, the second trial license will not be activated if installed before the first license expires.

NOTE
Trial licenses are not cumulative. The new license replaces the current license. To extend the license, you must contact your Brocade representative.

Console, syslog, and trap messages for trial license expiration

Three days prior to the date that a trial license is set to expire, the following warning message will appear daily on the console. Syslog and trap messages will also be generated.

```
SYSLOG: <12>Jan  1 00:00:00 624-top License: Package NI-CES-2024-L3U with LID
BCYXXXXXXXX expires in 3 days
```

On the day that the license will expire, a warning message will appear every two hours.

SYSLOG: <12>Jan 1 00:00:00 624-top License: Package NI-CES-2024-L3U with LID BCYXXXXXXXX expires in 4 hours

When the license has expired, the following message will appear on the console. Syslog and trap messages will also be generated.

```
SYSLOG: <13>Jan  1 00:00:00 624-top License: NI-CES-2024-L3U with LID BCYXXXXXXXX has
expired
```

Renewing or extending a trial license

A trial license can be extended once by another trial license of the same type, or by a normal license of the same type. To avoid any interruptions to the network, obtain and install the second trial license before the first license expires. When extended by another trial license, the duration is not cumulative. The countdown starts when the trial license is generated.

To extend the license, you must contact your Brocade representative.

NOTE
The start and end date of each trial license is predefined, based on the date and time it is generated.

Deleting a license

A license will remain in the license database until it is deleted. If you want to delete a license, Brocade recommends that you first disable the licensed feature before deleting the associated license.

To delete a license, enter a command such as the following at the privileged EXEC level of the CLI.

```
device# license delete 1
```

The **license delete** command immediately removes the license from the license database. The CLI commands related to the licensed feature will no longer be available from the CLI. The licensed feature will continue to run as configured until the software is reloaded, at which time the feature will be disabled and removed from the system. Syslog and trap messages are generated when the license is deleted.

Syntax: license delete *index_number*

The *index_number* is a valid license index number. This information can be retrieved from the **show license** command output.

Transferring a license

A license can be transferred between Brocade devices if the following conditions are true:

- The device is under an active support contract.
- The license is being transferred between two similar models (for example, from a 24-port model to another 24-port model or from a 48-port model to another 48-port model).

NOTE
A license transfer is intended for retrieving licenses from defective units. The licenses are removed from the defective unit in the database and the unit is flagged as removed from service.

NOTE
Transferring a license is only available within Brocade, and externally for designated partners with specific accounts in the Brocade software portal. Contact your Brocade representative for more information.

Special replacement instructions for legacy devices

A legacy device refers to a Brocade device that was shipped prior to the introduction of software-based licensing, has an EEPROM installed, and is running a software version prior to the Brocade NetIron 05.0.00 release.

For Brocade legacy devices in need of replacement (via a Return Merchandise Agreement (RMA)), the following actions must be taken:

- If the replacement device will be upgraded to a software release that supports software-based licensing, registration of the replacement device is required after the software is upgraded.
- If the replacement device will be using a software release that does *not* support software-based licensing, follow these instructions:

1. Prior to shipping the device in need of replacement back to the factory, remove the EEPROM from the device. To remove the EEPROM, follow the instructions in the appropriate hardware installation guide or in the instructions that shipped with the EEPROM.
2. After removing the EEPROM, store it in a safe place.
3. When the replacement device is received from the factory, install the same EEPROM in the device. To do so, follow the instructions that shipped with the EEPROM.

Viewing information about software licenses

The show commands associated with software licensing are issued on the Brocade device, at any level of the CLI.

NOTE
You can also view information about software licenses from the Brocade software portal. Refer to
Viewing information about software licenses.

Viewing the license

Brocade devices that ship during and after the release of software licensing will have the license ID
(LID) imprinted on the label affixed to the device. You can use the **show version** command as well to
view the LID on these devices, and on devices that shipped before the release of software licensing.

Use the **show version** command to display the serial number, license, and LID of the device. The
following example output shows a CES unit with the RT_SCALE and ADV_SVCS_PREM licenses.

```
device#show version
System: NetIron CER (Serial #: K40533F00H, Part #: 40-1000372-04)
License: RT_SCALE, ADV_SVCS_PREM (LID: BCYXXXXXXXX)
Boot : Version 5.3.0T185 Copyright (c) 1996-2009 Brocade Communications
Systems, Inc.
Compiled on Nov 16 2011 at 10:06:46 labeled as ceb05300
(447585 bytes) from boot flash
Monitor : Version 5.3.0T185 Copyright (c) 1996-2009 Brocade Communications
Systems, Inc.
Compiled on Nov 16 2011 at 10:06:46 labeled as ceb05300
(447585 bytes) from code flash
IronWare : Version 5.3.0T183 Copyright (c) 1996-2009 Brocade Communications
Systems, Inc.
Compiled on Jan 20 2012 at 18:56:08 labeled as ce05300
(14385657 bytes) from Primary
CPLD Version: 0x00000010
Micro-Controller Version: 0x0000000d
Extended route scalability
PBIF Version: 0x56
800 MHz Power PC processor 8544 (version 8021/0022) 400 MHz bus
512 KB Boot Flash (AM29LV040B), 64 MB Code Flash (MT28F256J3)
2048 MB DRAM
```

Viewing license information for line card modules

Brocade supports licensing for the following line card modules. With these licenses, the user can
upgrade the MLXe 20x1G (-M) and MLXe 20x1G (-X2) module to the 1G/10G (combo) module, BR-
MLX-10Gx20 20-port 1/10GbE.

The following example output displays the line card module with the 20x10G-1G-AND-10G-MODE
license installed.

```
device#show version slot 3
========================================================================
SL 1: BR-MLX-10Gx20 20-port 1/10GbE Module (Serial #: CWB0306K013, Part #:
60-1003017-01)
License: 20x10G-1G-AND-10G-MODE, 20x10G-WITH-1G-MODE-ONLY (LID: eydFIFLmFGI)
Boot : Version 5.7.0T175 Copyright (c) 1996-2014 Brocade Communications Systems, Inc.
Compiled on May 5 2014 at 10:42:40 labeled as xmlprm05700
 (447073 bytes) from boot flash
Monitor : Version 5.7.0T175 Copyright (c) 1996-2014 Brocade Communications Systems,
Inc.
Compiled on May 5 2014 at 10:43:08 labeled as xmlb05700
 (564163 bytes) from code flash
IronWare : Version 5.7.0pT177 Copyright (c) 1996-2014 Brocade Communications Systems,
Inc.
Compiled on Sep 30 2014 at 16:05:44 labeled as xmlp05700p021
 (7801298 bytes) from Primary
FPGA versions:
Valid PBIF Version = 2.01, Build Time = 7/16/2014 9:13:00

Valid XPP Version = 2.01, Build Time = 6/20/2014 21:37:00

MACXPP100G 0
MACXPP100G 1
1199 MHz MPC 8541 (version 8021/1051) 599 MHz bus
```

```
512 KB Boot Flash (MX29LV040C), 66846720 Bytes (~63 MB) Code Flash (MT28F256J3)
2048 MB DRAM, 8 KB SRAM, 286331153 Bytes (~273 MB) BRAM
LP Slot 1 uptime is 1 hours 10 minutes 43 seconds
================================================================================
All show version done
```

Viewing the license database

To display general information about all software licenses in the license database, use the **show license** command.

To display detailed information about a particular license, use the **show license** *index_number* command.

The following example output displays a Brocade MLXe unit with the 20x10G-1G-AND-10G-MODE license installed on the BR-MLX-1GX20-U10G-X2 module.

```
device#show license
Index Package Name          Lid         Slot  License Type  Status  License
Period
1     20x10G-WITH-1G-MODE-ONLY  eydFIJMlFFr  S3     normal      active    unlimited
2     20x10G-1G-AND-10G-MODE    eydFIJMlFFr  S3     normal      active    unlimited
3     20x10GbE-X2-Scaling-UPG   eydFIJMlFFr  S3     normal      active    unlimited
```

Syntax: show license [*index_number*]

Table 3 describes the information displayed by the **show license** command.

TABLE 3   Output from the show license command

Field	Description
Index	The license hash number that uniquely identifies the license.
+package name	The package name for the license.
+lid	The license ID. This number is embedded in the Brocade device.
Slot	Indicates that the license is active in the specified slot for the line card.
+license type	Indicates whether the license is normal (permanent) or trial (temporary).
+status	Indicates the status of the license: • **Valid** - A license is valid when the LID matches the serial number of the device for which the license was purchased, and the package name is recognized by the system. • **Active** - The license is valid and in effect on the device. • **Not used** - The license is not in effect on the device. • **Expired** - For trial licenses only, this indicates that the trial license has expired.
+license period	If the license type is trial (temporary), this field will display the number of days the license is valid. If the license type is normal (permanent), this field will display "unlimited".
Trial license information	
The following details display in the output of the **show license** *Index_number* command.	
+ days used	The number of days the trial license has been in effect.

TABLE 3 Output from the show license command (Continued)

Field	Description
+ hours used	The number of hours the trial license has been in effect.
+ days left	The number of days left before the trial license expires.
+ hours left	The number of hours left before the trial license expires.

Viewing active packages installed in the device

Use the show version command to view the active packages that are currently installed in the device.

NOTE
The active package name is not the same as the license name.

Table 4 lists the supported software packages.

TABLE 4 Software packages

Product	Software package name	License needed?
NetIron CES	NetIron CES 2000 Series BASE	No
	NetIron CES 2000 Series ME_PREM	Yes
	NetIron CES 2000 Series L3_PREM	Yes
NetIron CER	CER 2000 Series BASE	No
	CER 2000 Series ADV_SVCS_PREM	Yes

Viewing active packages installed in the device

NetIron licensed features and part numbers

This section lists the supported licensed features, associated image filenames, and related part numbers. There are no changes to the part numbers for products with pre-installed (factory-installed) licenses. These part numbers are listed for reference in the last column.

Brocade NetIron CES Series and the Brocade NetIron CER Series devices licensed features and part numbers

The table below lists the supported licensed features, associated image filenames, and related part numbers for the Brocade NetIron CES Series and the Brocade NetIron CER Series devices.

NOTE
There are no changes to the part numbers for products with pre-installed (factory-installed) licenses. These part numbers are listed for reference in the last column of the following tables.

TABLE 5 Licensed features and part numbers for the NetIron CES devices

Licensed feature or feature set	Image filename	Part numbers for software license only	Part numbers for hardware with pre-installed software license
EPREM Metro Edge Premium (Metro Edge Premium License) • All Classic Layer 2 capabilities • Base Layer 3 (RIP and static routes) • QoS and ACLs • Management via SNMP and CLI • IP over MPLS (IGP shortcuts) • GRE • Policy Based Routing (PBR) • Provider Bridges (IEEE 802.1ad) • Provider Backbone Bridges (IEEE 802.1ah) • In-band management for PB/PBB network • OSPF and ISIS	cer05700.bin	24 ports: NI-CES-2024-MEU	• NI-CES-2024F-MEPREM-AC • NI-CES-2024F-MEPREM-DC • NI-CES-2024C-MEPREM-AC • NI-CES-2024C-MEPREM-DC • NI-CES-2024FX-MEPREM-AC • NI-CES-2024FX-MEPREM-DC • NI-CES-2024CX-MEPREM-AC • NI-CES-2024CX-MEPREM-DC

TABLE 5   Licensed features and part numbers for the NetIron CES devices (Continued)

• Connectivity Fault Management (IEEE 802.1ag) and Service OAM • Ethernet Service Instance (ESI) framework • Multi-VRF • MPLS (VPLS, VLL) • 802.3ah Link OAM • Static IPv6 • RIPng • OSPFv3 • IS-ISv6	48 ports: NI-CES-2048-MEU	• NI-CES-2048F-MEPREM-AC • NI-CES-2048F-MEPREM-DC • NI-CES-2048C-MEPREM-AC • NI-CES-2048C-MEPREM-DC • NI-CES-2048FX-MEPREM-AC • NI-CES-2048FX-MEPREM-DC • NI-CES-2048CX-MEPREM-AC • NI-CES-2048CX-MEPREM-DC
EPREM L3_PREM (Layer 3 Premium License) • All Classic Layer 2 capabilities • Base Layer 3 (RIP and static routes) • QoS and ACLs • Management via SNMP and CLI • Full Layer 3 capabilities, including OSPF, ISIS, and BGP • Multi-VRF • Static IPv6 • RIPng • IS-ISv3 • OSPFv3 • BGP shortcuts (requires L3_PREM and ME_PREM) • GRE • Policy Based Routing (PBR) cer05700.bin	24 ports: NI-CES-2024-L3U	• NI-CES-2024F-L3PREM-AC • NI-CES-2024F-L3PREM-DC • NI-CES-2024C-L3PREM-AC • NI-CES-2024C-L3PREM-DC • NI-CES-2024FX-L3PREM-AC • NI-CES-2024FX-L3PREM-DC • NI-CES-2024CX-L3PREM-AC • NI-CES-2024CX-L3PREM-DC
	48 ports: NI-CES-2048-L3U	• NI-CES-2048F-L3PREM-AC • NI-CES-2048F-L3PREM-DC • NI-CES-2048C-L3PREM-AC • NI-CES-2048C-L3PREM-DC • NI-CES-2048FX-L3PREM-AC • NI-CES-2048FX-L3PREM-DC • NI-CES-2048CX-L3PREM-AC • NI-CES-2048CX-L3PREM-DC

TABLE 6   Licensed features and part numbers for the NetIron CER devices

Licensed feature or feature set	Image filename	Part numbers for software license only	Part numbers for hardware with pre-installed software license
Advanced Services Premium: • Full Layer 3, including RIP, OSPF, IS-IS, and BGP • Virtual routing in non-MPLS environments via Multi-VRF • All classic Layer 2 capabilities • QoS and ACLs • Management via SNMP/CLI • Multi-Protocol Label Switching (MPLS) • Layer 2 VPNs using VPLS and VLLs • Provider Bridges (IEEE 802.1ad) • Provider Backbone Bridges (IEEE 802.1ah) • Connectivity Fault Management (IEEE 802.1ag) and Service OAM • Ethernet Service Instance (ESI) framework	cer05700.bin	24 ports: NI-CER-2024-ADV	• NI-CER-2024F-ADVPREM-AC • NI-CER-2024F-ADVPREM-DC • NI-CER-2024C-ADVPREM-AC • NI-CER-2024C-ADVPREM-DC • NI-CER-2024FX-ADVPREM-AC • NI-CER-2024FX-ADVPREM-DC • NI-CER-2024CX-ADVPREM-AC • NI-CER-2024CX-ADVPREM-DC
		48 ports: NI-CER-2048-ADV	• NI-CER-2048F-ADVPREM-AC • NI-CER-2048F-ADVPREM-DC • NI-CER-2048C-ADVPREM-AC • NI-CER-2048C-ADVPREM-DC • NI-CER-2048FX-ADVPREM-AC • NI-CER-2048FX-ADVPREM-DC • NI-CER-2048CX-ADVPREM-AC • NI-CER-2048CX-ADVPREM-DC
CER-RT: Adds additional memory to support larger routing tables. • IPv4: 1.5M • IPv6: 256K • IPv4+IPv6 simultaneously: 1.45M+256K	cer05700.bin	IP_ROUTE_SCALE	• NI-CER-2024F-RT-AC • NI-CER-2024F-RT-DC • NI-CER-2024C-RT-AC • NI-CER-2024C-RT-DC • NI-CER-2024FX-RT-AC • NI-CER-2024FX-RT-DC • NI-CER-2024CX-RT-AC • NI-CER-2024CX-RT-DC • NI-CER-2048F-RT-AC • NI-CER-2048F-RT-DC • NI-CER-2048C-RT-AC • NI-CER-2048C-RT-DC • NI-CER-2048FX-RT-AC • NI-CER-2048FX--RT-DC • NI-CER-2048CX--RT-AC • NI-CER-2048CX-RT-DC

Brocade MLX Series devices licensed features and part numbers

Table 7 lists the supported licensed features, associated image filenames, and related part numbers for the Brocade NetIron MLX Series devices.

TABLE 7   Brocade MLX Series and NetIron routers

Licensed feature or feature set	Image filename	Part numbers for software license only	Part numbers for hardware with pre-installed software license
10x4G license upgrade (NetIron MLX and Brocade MLXe): • 4-port 10-GbE (X) module with IPv4/IPv6/MPLS hardware support - requires XFP optics. Supports 1 million IPv4 routes.	xgmacsp2_05600.bin	BR-MLX-10GX4-XUPG	BR-MLX-10GX4-X
100 GbE second port license upgrade: • Brocade MLX Series 100 GbE second port license upgrade — requires CFP optics.	xpp2x100_05600.bin	BR-MLX-100GX1-2PUPG	BR-MLX-100Gx2-X
License upgrade to 10-GbE for the 1-GbE (M) module (Brocade MLXe). To upgrade from 1-GbE to 10-GbE, purchase license: BR-MLX-1GX20-U10G-MUPG. The BR-MLX-1GX20-U10G-MUPG license is displayed on the CLI with package name 20x10G-1G-AND-10G-MODE. • MLXe 20-port 1-GbE (M) combo license upgrade support from 1-GbE to 10-GbE mode.	xpp20x10g3_05700.bin	BR-MLX-1GX20-U10G-MUPG	

TABLE 7   Brocade MLX Series and NetIron routers (Continued)

Licensed feature or feature set	Image filename	Part numbers for software license only	Part numbers for hardware with pre-installed software license
License upgrade to 10-Gbe for the1-GbE (X2) module (Brocade MLXe). Purchase license: BR-MLX-1GX20-U10G-X2UPG The BR-MLX-1GX20-U10G-X2UPG license is displayed on the CLI with 3 package names: 20x10GbE-X2-Scaling-UPG, 20x10G-WITH-1G-MODE-ONLY, and 20x10G-1G-AND-10G-MODE. • MLXe 20-port 1-GbE (X2) combo license upgrade support from 1-GbE to 10-GbE mode.	xpp20x10g3_05700.bin	BR-MLX-1GX20-U10G-X2UPG	
24x1G Copper license upgrade: • Enables 24-port 1Gbps copper module for wire-speed performance	pbifmrj_05600.bin xppmrj_05600.bin statsmrj_05600.bin	BR-MLX-1Gx4-UPG	BR-MLX-1GCx24-X
24x1G Fiber license upgrade: • Enables 24-port 1Gbps fiber module for wire-speed performance.	pbifmrj_05600.bin xppmrj_05600.bin statsmrj_05600.bin	BR-MLX-1Gx4-UPG	BR-MLX-1GFx24-X

Troubleshooting

This appendix contains information about specific system log messages that you may find useful when you perform your Brocade NetIron software licensing.

Syslog messages

The table below lists the syslog messages supported for software-based licensing.

Message	License: Package <*package_name*> with LID <*LID_number*> is added
Explanation	Indicates that the license package has been added.
Message Level	Informational

Message	License: Package <*package_name*> with LID <*LID_number*> is removed
Explanation	Indicates that the license package has been deleted.
Message Level	Informational

Message	License: Package <*package_name*> with LID <*LID_number*> expires in <*number*> days
Explanation	The trial license is about to expire. This message will begin to display 3 days before the expiration date, and every day until the license will expire.
Message Level	Warning

Message	License: Package <*package_name*> with LID <*LID_number*> expires in <*number*> hours
Explanation	The trial license is about to expire. This message will begin to display every 2 hours on the last day that the license will expire.
Message Level	Warning

Message	`License: Package <package_name> with LID` `<LID_number> has expired`
Explanation	The trial license has expired.
Message Level	Notification