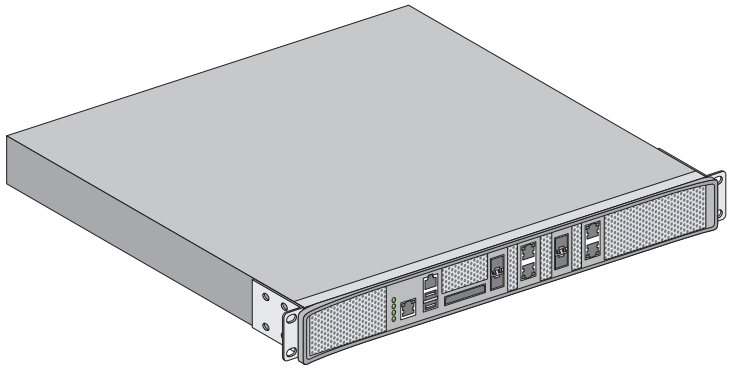
Brocade Mobility RFS7000-GR Controller

Installation Guide

Supporting software release 4.1.0.0-040GR and later



BROCADE

53-1001946-01

5 3 - 1 0 0 1 9 4 6 - 0 1

Brocade Communications Systems, Incorporated

Corporate and Latin American Headquarters
Brocade Communications Systems, Inc.
130 Holger Way
San Jose, CA 95134
Tel: 1-408-333-8000
Fax: 1-408-333-8101
E-mail: info@brocade.com

Asia-Pacific Headquarters
Brocade Communications Systems China HK, Ltd.
No. 1 Guanghua Road
Chao Yang District
Units 2718 and 2818
Beijing 100020, China
Tel: +8610 6588 8888
Fax: +8610 6588 9999
E-mail: china-info@brocade.com

European Headquarters
Brocade Communications Switzerland Sàrl
Centre Swissair
Tour B - 4ème étage
29, Route de l'Aéroport
Case Postale 105
CH-1215 Genève 15
Switzerland
Tel: +41 22 799 5640
Fax: +41 22 799 5641
E-mail: emea-info@brocade.com

Asia-Pacific Headquarters
Brocade Communications Systems Co., Ltd. (Shenzhen WFOE)
Citic Plaza
No. 233 Tian He Road North
Unit 1308 – 13th Floor
Guangzhou, China
Tel: +8620 3891 2000
Fax: +8620 3891 2111
E-mail: china-info@brocade.com

Document History

Title	Publication number	Summary of changes	Date
Brocade Mobility RFS7000-GR Controller Installation Guide	53-1001946-01	New document	Sept 2010

About This Document

In this chapter

Audience

This document is designed for system administrators with a working knowledge of Layer 2 and Layer 3 switching and routing.

If you are using a Brocade Layer 3 Switch, you should be familiar with the following protocols if applicable to your network – IP, RIP, OSPF, BGP, ISIS, IGMP, PIM, and VRRP.

Supported hardware and software

The following hardware platforms are supported by this release of this guide:

- Brocade Mobility RFS7000-GR Controller

The following software version is supported by this release of this guide:

- Software version 4.1.0.0-040GR and later

Document conventions

This section describes text formatting conventions and important notice formats used in this document.

Notes, cautions, and warnings

The following notices and statements are used in this manual. They are listed below in 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.

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.

Contacting Brocade

When contacting Brocade support, please provide the following information:

- Serial number of the unit
- Model number or product name
- Software version

Customer Support Web Site

Brocade Support Central Web site, located at www.brocade.com/support provides information and online assistance including developer tools, software downloads, product manuals and online repair requests.

Downloads

http://www.brocade.com/support/

Manuals

http://www.brocade.com/support/

Because quality is our first concern at Brocade, 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. Forward your feedback to: *documentation@brocade.com*.

Provide the title and version number and as much detail as possible about your comment, including the topic heading and page number and your suggestions for improvement.

Email and telephone access

Go to *http://www.brocade.com/services-support/index.page* for e-mail and telephone contact information.

Warranty coverage

Contact Brocade Communications Systems using any of the methods listed above for information about the standard and extended warranties.

Chapter

1 Introduction

In this chapter

The Brocade Mobility RFS7000-GR Controller is a high-performance member of Brocade's wireless controller family. The Brocade Mobility RFS7000-GR Controller provides centralized Wireless LAN (WLAN) configuration and management by coalescing a network "intelligence" previously spread across physically distributed access points. By replacing access points with simpler access ports (or "thin" access points), the Brocade Mobility RFS7000-GR Controller becomes a WLAN's single point of contact, thus reducing wireless networking complexity by moving management out of the ceiling and into the wiring closet. In addition, through the use of patented Virtual AP architecture, the Brocade Mobility RFS7000-GR Controller lets you create multiple WLANs without changing or adding to the existing wired network infrastructure.

This document is written for the network device installer.

Package contents

Inspect the package contents and report any missing or damaged items to your sales representative. The package should contain the following:

- Brocade Mobility RFS7000-GR Controller with rack brackets and tamper evident labels installed
- Console Cable
- *Brocade Mobility RFS7000-GR Controller Installation Guide* (this document)
- China RoHS compliance document

Document conventions

The following graphical alerts are used in this document to indicate notable situations:

NOTE
Tips, hints, or special requirements that you should take note of.

CAUTION

Care is required. Disregarding a caution can result in data loss or equipment malfunction.

DANGER

Indicates a condition or procedure that could result in personal injury or equipment damage.

Warnings

- Read all installation instructions and site survey reports, and verify correct equipment installation before connecting the system to its power source.
- Remove jewelry and watches before installing this equipment.
- Install the equipment in a rack with adequate dimensions and weight allowances.
- Verify the rack is anchored and cannot tip over or break away from its mountings.
- Verify the unit is grounded before connecting it to the power source.
- Verify any device connected to this unit is properly wired and grounded.
- Connect all power cords to a properly wired and grounded electrical circuit.
- Verify the electrical circuits have appropriate overload protection.
- Attach only approved power cords to the device.

- Brocade strongly recommends the use of an Uninterruptible Power Supply (UPS) that supports the IP-RFS7000 power rating. Not using a UPS can result in data loss or equipment damage due to a power surge or power failure.
- Verify that the power connector and socket are accessible at all times during the operation of the equipment.
- Do not work with power circuits in dimly lit spaces.
- Do not install this equipment or work with its power circuits during thunderstorms or other weather conditions that could cause a power surge.
- Verify there is adequate ventilation around the device, and ambient temperatures meet equipment operation specifications.

Site preparation

- Consult your site survey and network analysis reports to determine specific equipment placement, port capacity, power drops, and so on.
- Assign installation responsibility to the appropriate personnel.
- Identify where all installed components are located.
- Verify appropriate rack mounting requirements.
- Provide a sufficient number of power drops for your equipment.
- Ensure adequate, dust-free ventilation to all installed equipment.
- Identify and prepare Ethernet and console port connections.
- Verify that cable lengths are within the maximum allowable distances for optimal signal transmission.
- Verify that the Brocade Mobility RFS7000-GR Controller is powered through an Uninterruptible Power Supply (UPS).

1 Site preparation

Chapter

2

Specifications

In this chapter

Physical specifications

Width	440mm (17.32 in)
Height	44.45mm (1.75 in)
Depth	390.8mm (15.38 in)
Weight	6.12 Kg (13.5 lbs)
Operating Temperature	0 °C - 40 °C
Operating Humidity	5% - 85% RH, non-condensing
Operating Altitude	3 km (10000 ft)

Power cord specifications

A power cord is not supplied with the controller. Use only a correctly rated power cord certified (as appropriate) for the country of operation.

Power protection

- **If possible, use a circuit dedicated to data processing equipment.** Commercial electrical contractors are familiar with wiring for data processing equipment and can help with the load balancing of these circuits.

- **Install surge protection.** Be sure to use a surge protection device between the electricity source and the Brocade Mobility RFS7000-GR Controller.
- **Install an Uninterruptible Power Supply (UPS).** A UPS provides continuous power during a power outage. Some UPS devices have integral surge protection. UPS equipment requires periodic maintenance to ensure reliability. A UPS of the proper capacity for the data processing equipment must be purchased.

Chapter

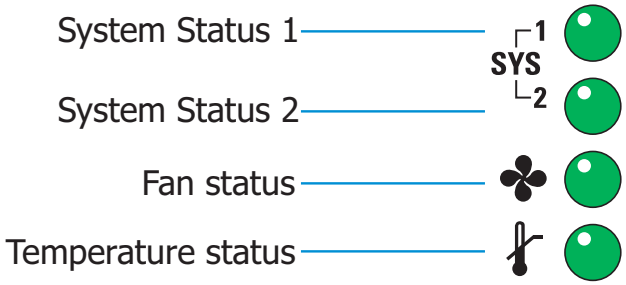
3

LED Codes

In this chapter

The Brocade Mobility RFS7000-GR Controller has four vertically-stacked LEDs on its front panel. Each of the controller's Gigabit Ethernet ports have two status LEDs. These LEDs display two colors (green & amber), and three lit states (solid, blinking, and off). The following tables decode the combinations of LED colors and states for the System Status LEDs and the Gigabit Ethernet LEDs.

System status LEDs



Start up / POST (primary system or redundant system)

System Status 1 LED	System Status 2 LED	Event
Off	Off	Power off
Green Blinking	Green Blinking	Power On Self Test (POST) running
Green Solid	Green Blinking	POST succeeded (Operating System Loading)
Green Solid	Off	POST succeeded (Normal Operation)
Amber Blinking	Off	POST Failure
Alternating Green Blinking & Amber Blinking	Alternating Green Blinking & Amber Blinking	Boot Up Error: Device has an invalid checksum

NOTE
During controller start up, the Temperature status LED will be lit Solid Amber. This is normal behavior and does not indicate an error. At the completion of start up the Temperature Status LED will switch to Solid Green.

Controller status (primary system)

System Status 1 LED	System Status 2 LED	Event
Off	Off	Power off
Green Solid	Off	No Redundancy Feature Enabled

System Status 1 LED	System Status 2 LED	Event
Green Solid	Green Solid	Redundancy Feature Enabled Actively Adopting Access Ports
Green Solid	Amber Blinking	No License to adopt Access Ports or No Country Code configured on the controller or License and Country Code configured, but no APs adopted

Controller status (redundant system)

System Status 1 LED	System Status 2 LED	Event
Off	Off	Power off
Green Solid	Off	No Redundancy Feature Enabled
Green Blinking	Green Solid	Redundant System failed over and adopting ports
Green Blinking	Alternating Green Blinking & Amber Blinking	Redundant System not failed over.
Green Solid	Amber Blinking	No License to adopt Access Ports or No Country Code configured on the controller or License and Country Code configured, but no APs adopted

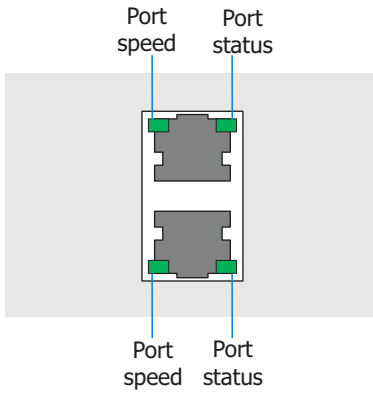
Fan LED

Fan LED	Event
Off	System Off / POST Start
Green Blinking	POST in Process
Green Solid	All System Fans Normal Operation
Amber Solid	Redundant Cooling Failure System Operational
Amber Blinking	System Cooling Failure *System will be held in reset until the issue is resolved*

Temperature status LED

Temperature LED	Event
Off	System Off
Green Solid	Ambient Inlet Temperature is within specified operating limit
Amber Solid	Ambient Inlet Temperature is near the maximum operating temperature During controller start up this LED will be lit Solid Amber. This is normal behavior and does not indicate an error.
Amber Blinking	Ambient Inlet Temperature is above the maximum specified operating temperature *System will be held in reset until the issue is resolved*

RJ-45 gigabit Ethernet LEDs



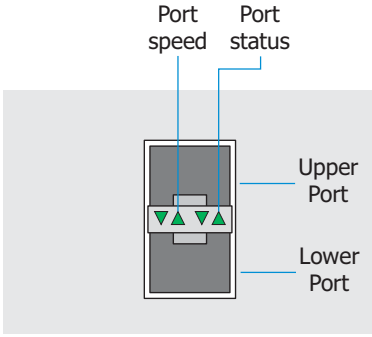
RJ-45 port speed LED

Port Speed LED	Event
Off	10 Mbps
Green Solid	100 Mbps
Green Blinking	1000 Mbps
Amber Blinking	Port Fault

RJ-45 port status LED

Port Status LED	Event
Off	No Link or Administratively shut down
Green Solid	Link present
Green Blinking	Activity: Transmit and Receive
Amber Blinking	Link Fault

SFP gigabit Ethernet LEDs



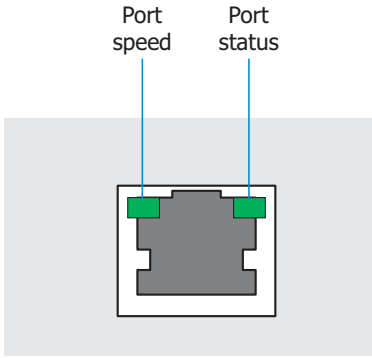
SFP port speed LED

Port Speed LED	Event
Green Blinking	1000 Mbps
Amber Blinking	Module or Tx/Rx Fault Loss

SFP port status LED

Port Status LED	Event
Off	No Link or Administratively shut down
Green Solid	Link present / Operational
Amber Blinking	Module or Tx/Rx Fault Loss

Out of band management port LEDs



Out of band management port speed LED

Port Speed LED	Event
Off	10 Mbps
Green Solid	100 Mbps
Amber Blinking	Port Fault

Out of band management port status LED

Port Status LED	Event
Off	No Link
Green Solid	Link present
Green Blinking	Activity: Transmit and Receive
Amber Blinking	Link Fault

3 Out of band management port status LED

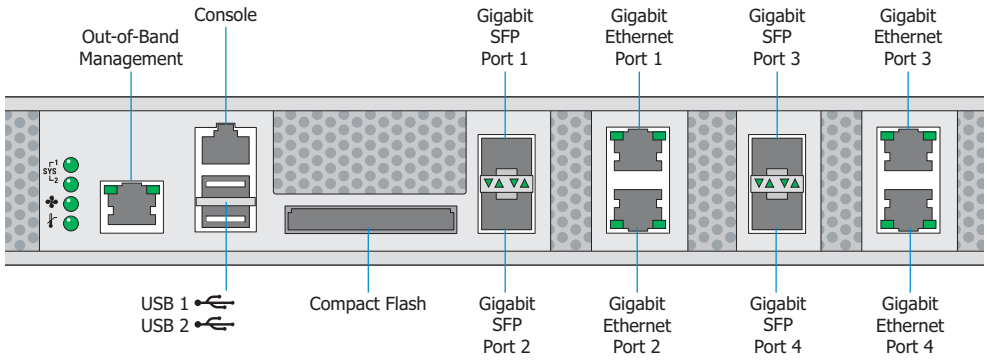
Chapter

4

Hardware Setup

This chapter contains the following sections:

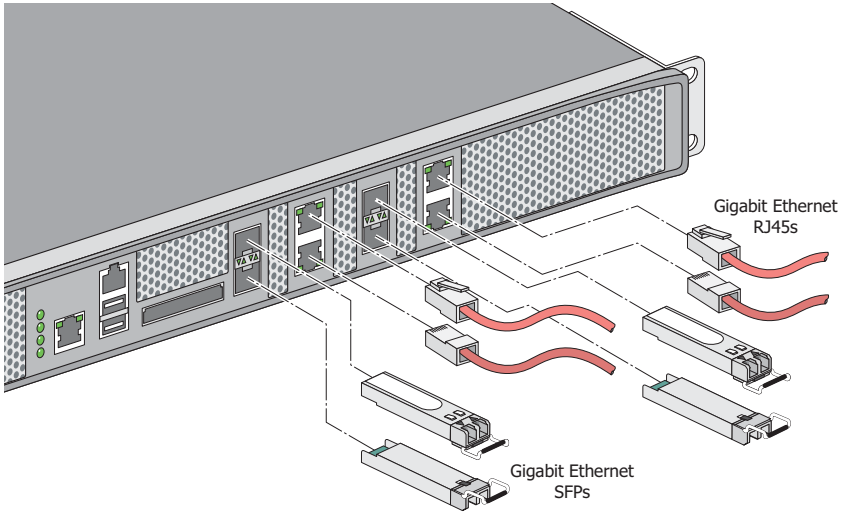
Cabling information



NOTE
The USB and Compact Flash ports are not available for the GR release of this product and are covered with tamper evident labels.

The Brocade Mobility RFS7000-GR Controller has four RJ-45 Gigabit Ethernet ports, four Gigabit SFP (fiber) ports, one Out-of-band management port and one Console connector. The above diagram shows each of those ports and the cables or devices attached to them. The sections that follow describe detailed connection and cabling information for each port.

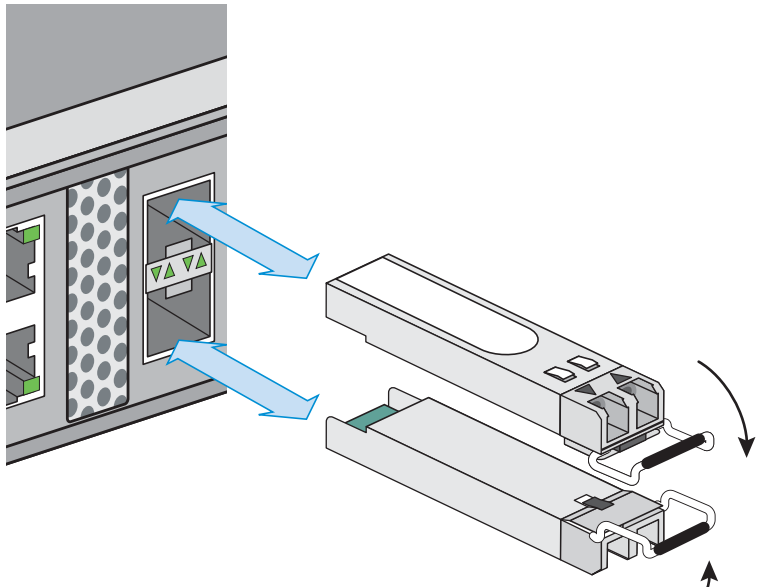
Gigabit Ethernet on the Brocade Mobility RFS7000-GR Controller



The Brocade Mobility RFS7000-GR Controller has four RJ-45 Gigabit Ethernet ports and four Gigabit SFP (fiber optic) ports. Using the RJ-45 ports requires connecting a Category-6 Ethernet cable to the port. To use the Gigabit SFP ports, first install the SFP Modules.

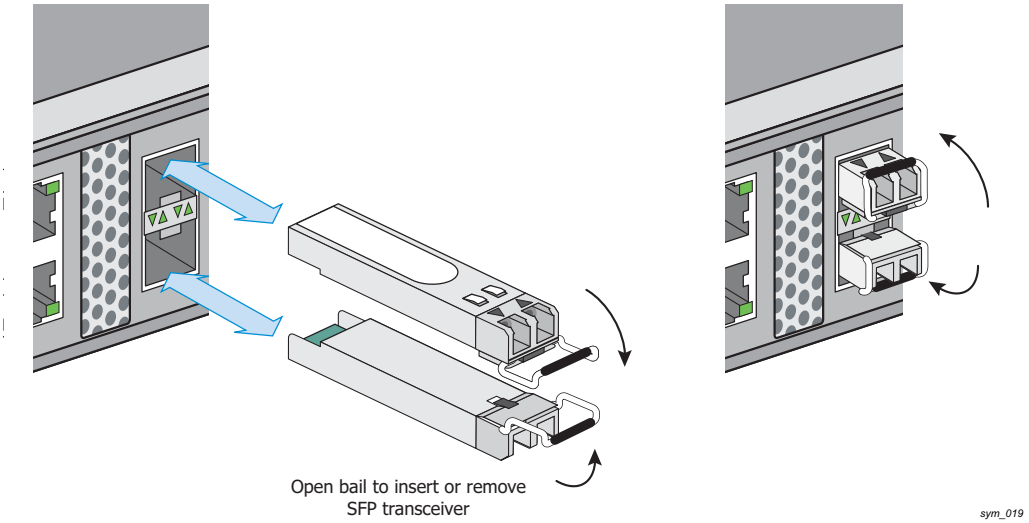
Installing Gigabit Ethernet SFPs

1. Open the bail on the transceiver.

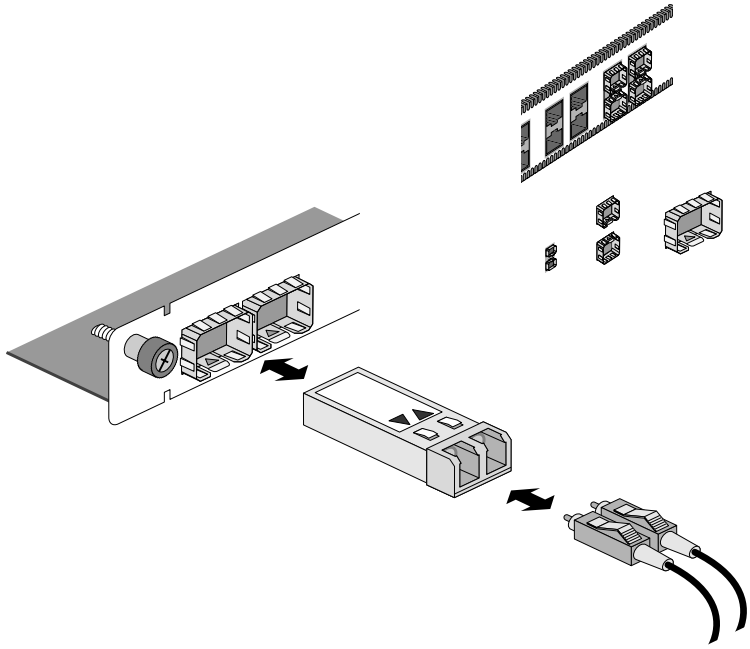


2. Insert each of the SFP transceivers into the corresponding ports on the switch.

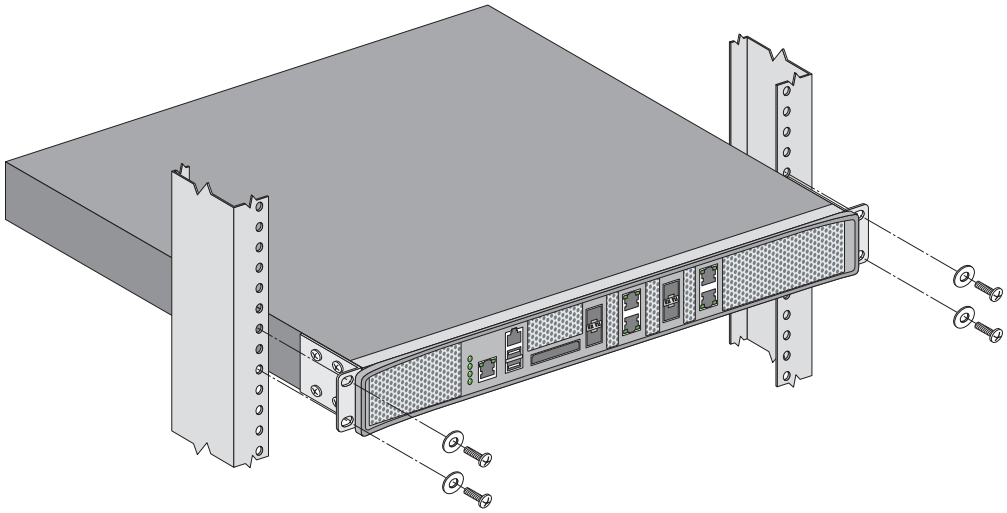
3. Once the SFP transceivers are properly seated in their ports, close the bails to lock the transceivers in place.



4. Insert the fiber optic cables into the installed transceivers.



Rack mount instructions



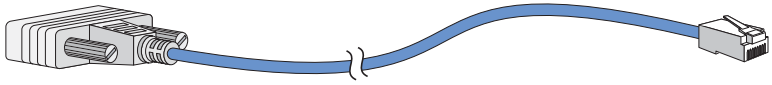
To install the Brocade Mobility RFS7000-GR Controller in a rack:

1. The rack mounting brackets are installed at the factory. No additional steps are needed.
2. Attach the brackets to the rack using screws appropriate for your rack's mounting holes.

Brocade Mobility RFS7000-GR Controller console port setup

To add the Brocade Mobility RFS7000-GR Controller to the network and prepare it for initial configuration:

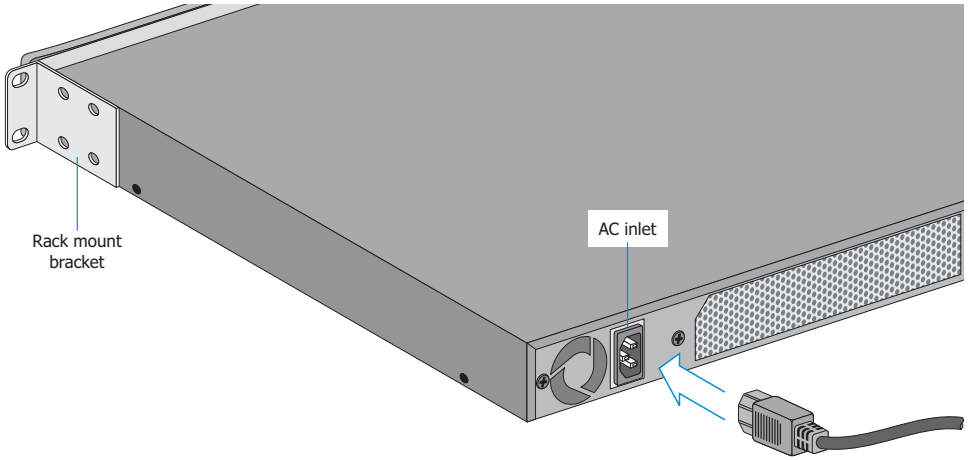
1. Using the supplied console cable (pictured below), connect the Brocade Mobility RFS7000-GR Controller serial port to an RS-232 (DB-9) serial port on a separate computer (the “configuration computer”).



2. On the configuration computer, configure a terminal emulation application (such as **HyperTerminal**) as follows:

Terminal Type	VT-100
Port	COM port
Terminal Settings	19200bps transfer rate 8 data bits no parity 1 stop bit no flow control no hardware compression

Supplying power to the Brocade Mobility RFS7000-GR Controller



1. Plug an approved AC power cord into the power connector at the back of the Brocade Mobility RFS7000-GR Controller.
2. Plug the cord into a standard AC outlet with a voltage range of 100 to 240 VAC.

CAUTION

An improper shutdown can render the Brocade Mobility RFS7000-GR Controller inoperable such that it could require service by Brocade Support. Do not remove AC power without first following the shutdown procedure. An abrupt loss of power can corrupt the information stored on the device.

Verifying the installation

View the LEDs on the front panel of the Brocade Mobility RFS7000-GR Controller to ensure the device is functioning properly. The normal LED pattern follows this path:

- During the Power On Self Test (POST), the System 1 and System 2 LEDs both blink green.
- If the POST test fails, the System 1 LED will blink amber. If the POST test succeeds, the System 1 LED will be lit solid green.
- As the software is initialized, the System 2 LED will blink green.
- After the software has finished initializing, the System 1 LED will be lit solid green and the bottom System 2 LED will be off.

Other LED codes indicate the presence (or absence) of different standby states, or errors. A guide to the Brocade Mobility RFS7000-GR Controller LEDs codes is provided in LED Codes on page 3-7.

4 Verifying the installation

Chapter

Secure Installation Procedure 5

In this chapter

This installation procedure explains how to login to the Command Line Interface for initial configuration.

Through this process the wireless controller is configured with a set of default values for specific features. These default values should be changed in order to maintain the security of the wireless users and access to the controller.

Command line interface login procedure for the wireless controller

1. Enter “cli” at login prompt

```
RFS7000 login: cli
This device is running on FIPS mode.
Attention:
This is a protected and private wireless system. No un-authorized
access allowed. You must have proper rights to access and manage
this system from the authorized personnel.
Do you want to proceed? (y/n):y
```

2. Enter “admin” at username prompt

```
Username: admin
```

3. Enter “0umP.s45fIOD6” at Password prompt below. (“0umP.s45fIOD6 is the default password for admin user).

```
Password:
```

4. Once Username and Password credentials are validated, the controller will prompt to change the default password to a new value. Please change the default password of the admin user.

```
Password is same as default password, please change the password
Enter old password:          <type old password>
Enter new password:          <type new password>
Re Enter new password:       <type new password>
Password for user 'admin' changed successfully
RFS7000>
```

5. Once Username and Password credentials are validated, the below prompt will returned. Enter “Enable” to get into execution mode.

```
RFS7000>enable
RFS7000#
```

6. To get into configuration mode, enter “configure terminal” at “exec-mode” prompt above.

```
RFS7000# configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
RFS7000(config)#
```

Changing default wireless controller parameters

The various default parameters which must be changed to operate the wireless controller in a secured operational mode are listed below:

1. Change the SNMP users (snmpoperator, snmpmanager and snmptrap) default passwords to new values.

   Go to the global configuration context and change the default passwords of SNMP for all the 3 SNMP users.

```
RFS7000(config)#snmp-server user snmpmanager v3 encrypted des
auth md5 <password>RFS7000(config)#snmp-server user snmpoperator
v3 encrypted des auth md5 <password>
RFS7000(config)#snmp-server user snmptrap v3 encrypted des auth
md5 <password>
```

2. By default SNMP manager is disabled and need to start SNMP manager for GUI access. Go to the global configuration context and start SNMP manager.

```
RFS7000(config)#snmp-server manager v3
```

3. Change the default Admin password (Superuser) .

```
RFS7000(config)#username admin password 0 a%defMyj
```

NOTE
The password `a%defMyj` is only an example. Enter a unique password in place of this example.

4. Country code must be set to the appropriate country in order to have proper channel of operations. Access Points are adopted after the country code is set.

   a. Enter “wireless configuration mode”

   ```
   RFS7000(config)#wireless
   ```

   b. Execute the following in wireless configuration mode.

   ```
   RFS7000(config-wireless)#country-code us
   ```

CAUTION
Select only the country in which you are using the device. Any other selection may make the operation of this device illegal.

5. The default SSID for all WLANs (wireless LANs) in the system is “101”. This SSID should be changed to ensure secure operation.

   a. Go to “wireless configuration mode” and execute the following:

   ```
   RFS7000(config-wireless)#wlan 1 ssid myOwnSsid
   ```

NOTE
The SSID of `myOwnSsid` is only an example. Enter a unique SSID in place of this example.

6. The default encryption for the WLAN must be changed before enabling the WLAN.

   a. Select the Encryption type. The default encryption is AES/CCMP.

   ```
   RFS7000(config-wireless)#wlan 1 encryption-type ccmp
   ```

   b. By default pre-shared key is used for AES/CCMP encryption with a default key used for all WLANs. This key must be changed before enabling the WLAN.

   ```
   RFS7000(config-wireless)#wlan 1 dot11i key 0
   acdefab12345678abcdefab12345678abcdefab12345678abcdefab123456
   78
   ```

NOTE
The pre-shared key:
`acdefab12345678abcdefab12345678abcdefab12345678abcdefab12345678` is only an example. Enter a unique pre-shared key in place of this example.

7. Self Signed certificates should be replaced with a private certificate.

   a. The controller ships with a default trust point using a default self-signed certificate. This certificate is associated with the hotspot and onboard RADIUS server. This certificate should be replaced with a valid certificate from a Certificate Authority.

   b. The following command will show the existing self-signed certificate.

```
RFS7000(config)#show crypto pki trustpoints
Trustpoint :default-trustpoint
------------------------------------------------
 Server certificate configured
    Subject Name:
      Common Name:         Brocade
      Organizational Unit: EWLAN
      Organization:        Enterprise Mobility
      Location:            San Jose
      State:               CA
      Country:             US
    Issuer Name:
      Common Name:         Brocade
      Organizational Unit: EWLAN
      Organization:        Enterprise Mobility
      Location:            San Jose
      State:               CA
      Country:             US
 Valid From:   Jan 29 15:13:44 2008 GMT
 Valid Until:  Jan 28 15:13:44 2009 GMT
```

   c. Create a new trust point.

```
RFS7000(config)#crypto pki trustpoint externalCert
RFS7000(config-trustpoint)#subject-name motoFips US CA "San
Jose" Moto "WLAN division"
RFS7000(config)#crypto pki enroll externalCert request
```

   d. The following command displays the above created trust point and certificate request:

```
RFS7000(config)#show crypto pki request externalCert
```

```
-----BEGIN CERTIFICATE REQUEST-----
MIIB2jCCAUMCAQAwZzELMAkGA1UEBhMCVVMxCzAJBgNVBAgTAkNBMREwDwYDV
QQH
EwhTYW4gSm9zZTENMAsGA1UEChMETW90bzEWMBQGA1UECxMNV0xBTiBkaXZpc
2lv
bjERMA8GA1UEAxMIbW90b0ZpcHMwgZ8wDQYJKoZIhvcNAQEBBQADgY0AMIGJA
oGB
AMHr9U1XAEhhEInvVHsyFkvjnKcX7RVbiC01HkGrBMTipKZMx/vQ/zbHlzNcj
72k
FwH9aJeI68tOEjvOK/9287UUqt9T73cti+VZf9h8rmvWTSQsOZ5GogGhYvc/n
Jee
mQF7OSjXi2J1CjkIhQTarpGv9/TW2RSWOGFa5wtwbt0BAgMBAAGgMzAxBgkqh
kiG
9w0BCQ4xJDAiMAsGA1UdDwQEAwIEsDATBgNVHSUEDDAKBggrBgEFBQcDATANB
gkq
hkiG9w0BAQUFAAOBgQCHPKPXA/0XQQts10hPaEsgtF723kBYumMjL0gYDW1aJ
kUT
wh+6JD5hhjPiwgTjRBM5wtBlvGbVltunnRy0ukXWxgJG4p4lc85clF0n24Xkq
D7i
3p9A5aGN0Bruchtu/ToTEvKjqd7hwkcH96V6JZDW++aSVdT5lUxr8QDhg9GwN
g==
-----END CERTIFICATE REQUEST-----
```

e. Export this certificate request to an external machine/server where the request can be submitted to the Certificate Authority as shown below.

```
RFS7000(config)#crypto pki export externalCert request
sftp://root@10.10.10.10/RF7000-server-req
```

f. Import the CA certificate obtained from the external signing authority using SFTP as shown below.

```
RFS7000(config)#crypto pki authenticate externalCert
sftp://root@10.10.10.10/CA_Cert.der
```

NOTE
In the above example code, the SFTP server IP Address is 10.10.10.10.

g. Import the Server certificate obtained from external CA using SFTP.

```
RFS7000(config)#crypto pki import externalCert certificate
sftp://root@10.10.10.10/Serv_Cert.der
```

h. Associate the newly created trustpoint with the hotspot feature using the example below:

```
RFS7000(config)#no ip http secure-server
RFS7000(config)#ip http secure-trustpoint externalCert
```

i. Enable http and https access to the hotspot page:

```
RFS7000(config)#ip http secure-server
RFS7000(config)#ip http server
```

j. Associate the newly created trustpoint with the onboard RADIUS server using the example below:

```
RFS7000(config)#radius-server local
RFS7000(config-radsrv)#ca trust-point externalCert
RFS7000(config-radsrv)#server trust-point externalCert
```

k. Restart the RADIUS server.

```
RFS7000(config)#service radius restart
```

l. Write the changes to memory.

```
RFS7000(config)#write memory
```

Chapter

Regulatory Information 6

This regulatory section applies to the Mobility RFS7000 Controller.

All Brocade devices are designed to be compliant with rules and regulations in locations they are sold and will be labeled as required.

Any changes or modifications to Brocade equipment, not expressly approved by Brocade, could void the user's authority to operate the equipment.

Country selection

Select only the country in which you are using the device. Any other selection will make the operation of this device illegal.

Laser devices - Gigabit Ethernet SFP option

Complies with 21CFR1040.10 and 1040.11 except for deviations pursuant to Laser Notice No. 50, dated July 26, 2001.

EN60825-1:1994+ A1:2002 +A2:2001

IEC60825-1:1993+A1:1997+A2:2001

The laser classification is marked on the device.

Class 1 Laser devices are not considered to be hazardous when used for their intended purpose. The following statement is required to comply with US and international regulations:

CAUTION

This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Radio frequency interference requirements - FCC

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Radio frequency interference requirements - Canada

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

CE marking and European Economic Area (EEA)

Statement of compliance

Brocade hereby declares that this device is in compliance with all the applicable Directives, 2004/108/EC, 2006/95/EC. A Declaration of Conformity may be obtained from *http://www2symbol.com/doc/*

Waste Electrical and Electronic Equipment (WEEE)

For information on WEEE, please go to:
http://www.brocade.com/sites/dotcom/company/corporate-responsibility/corporate-citizenship/product-recycling/weee.page

6 Waste Electrical and Electronic Equipment (WEEE)