



ELTEXALATAU

Complete solutions for networking

MA4000-PX (v. 3.24.0)

Operation Manual Appendix

MA4000-PX Quick Setup Guide (v.3.24.0)

Subscriber access and aggregation node

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1 ABSTRACT

This operation manual describes:

- Connection methods for MA4000-PX Command Line Interface (CLI) (hereinafter the "device")
- Adjustment of the device network settings
- VLAN configuration for provision of various services
- Configuration of SNMP and Sntp services
- Automatic configuration upload settings
- IGMP configuration
- LACP configuration
- Creation and editing of ONT profiles: Ports, Cross-Connect
- Adding and editing subscriber-side devices
- Configuration of OLT profiles (PPPoE_IA, DHCP_RA)
- Updating device firmware

The following diagram will be used for illustrative purposes, Fig. 1:

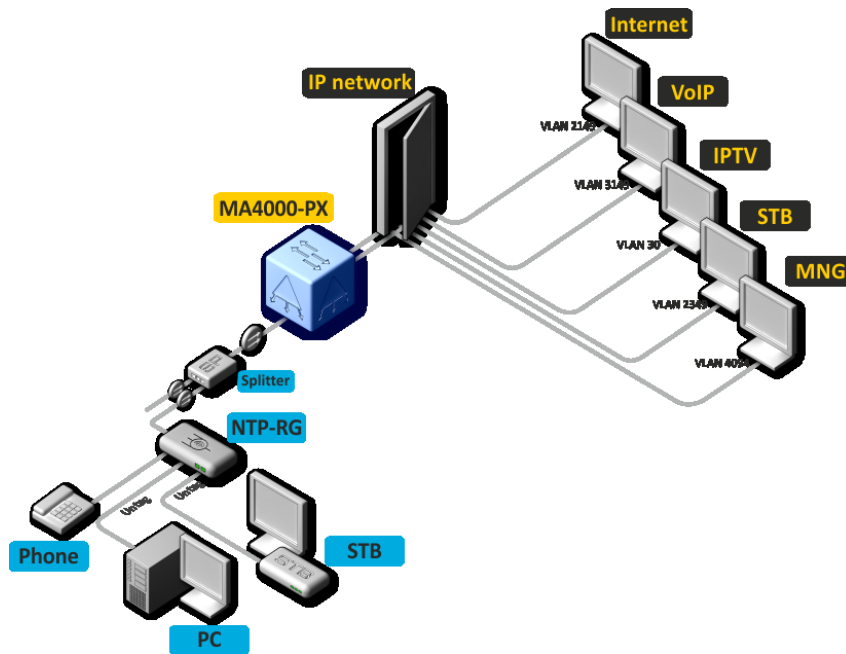


Fig. 1—Example of the network configuration

Table 1—Service type and VLAN number description

Type of service	VLAN used
Internet	2149
VoIP	3149
IPTV (multicast)	30
STB	2349
MNG	4094

2 CONNECTION METHODS FOR COMMAND LINE INTERFACE (CLI)

2.1 Telnet/SSH connection

Connect the network data cable (patch cord) to the COMBO port 0 located on PP4X board installed in the PPO slot.

SSH/Telnet connection requires the following factory settings:

- **Default IP** **192.168.1.2**
- **Default mask** **255.255.255.0**
- **Default GW** **192.168.1.1**

- **Login:** **admin**
- **Password:** **password**

```
*****
*           Welcome to MA4000           *
*****
MA4000 login: admin
Password:

Technical support: http://eltex.nsk.ru/support
Thu Mar  3 16:24:54 LOCAL 2016

MA4000#
```

2.2 Serial port connection (console)

Null modem cable is required for this type of connection. For null modem cable wiring diagram, see Appendix B.

To establish connection via serial port, enter the following settings:

- **Bit rate:** **115200bps**
- **Data bits:** **8bit**
- **Parity:** **no**
- **Stop bits:** **1**
- **Flow control:** **no**

- **Login:** **admin**
- **Password:** **password**

Connect to the PP4X module. If there are two PP4X boards installed, the serial port should be connected to the master board (identified by the green 'Master' LED indicator)

```
*****
*           Welcome to MA4000           *
*****
MA4000 login: admin
Password:
```

```
Technical support: http://eltex.nsk.ru/support
Thu Mar  3 16:24:54 LOCAL 2016

MA4000#
```



For security reasons, we recommend to change the default password during the first connection (see Paragraph 2.3 Changing user password).

2.3 Changing user password

To change user settings, enter the **Configure view** terminal configuration mode using the **configure terminal** command.

To change user password, use the **user** command. Pass the user name and the password as parameters.

```
MA4000# configure terminal           Enter the configuration mode
MA4000(config)# user <operator> password <xxxxxx>  where <operator> is the user name,
                                                    <xxxxxx> is the new password
MA4000(config)# do commit          Apply the configuration
MA4000(config)# do confirm         Save the configuration
```

3 ADJUSTMENT OF PP4X NETWORK SETTINGS

To enable the remote rack configuration, specify equipment network parameters according to the existing settings for the network, where the equipment is intended to be used. We recommend to change the network parameters of the device in CLI connection mode via the serial interface.

If there are two PP4X boards installed, enter the **Configure view** terminal configuration mode using the **configure terminal** command and configure their synchronization with **stack sync-allow** command.

```
MA4000# stack sync-allow
Command accepted. Automatic synchronization (if needed) will be performed in the
background shortly.
MA4000#
```

Use **show stack** command to check the PP4X synchronization.

```
MA4000# show stack

  Stack Units
  ~~~~~
Unit  Position  Role    Prio  MAC Address          Version
----  -
*1    Left        MASTER  240   a8:f9:4b:81:ae:60    3 24 0 452 44381
 2    Right       BACKUP  208   a8:f9:4b:81:ae:20    3 24 0 452 44381

Synchronization state in the stack: Enabled

  Stack-channel State
  ~~~~~
Interface          Status
-----
stack-port 1/0     up
stack-port 1/1     up
```

Set the *Synchronization state in the stack* parameter to *Enabled* in the *Stack Units* table.

To configure PP4X module network parameters, enter the configuration mode using the **configure terminal** command.

Define the required network settings. For instance: IP=192.168.205.113, Mask=255.255.255.0, Gateway=192.168.205.230, and specify VLAN for the management network.

```

MA4000# configure terminal                               Enter the configuration mode
MA4000(config)# management ip 192.168.205.113 255.255.255.0
MA4000(config)# management gateway 192.168.205.230
MA4000(config)# management vlan 4000
MA4000(config)# do commit                               Apply the configuration
MA4000(config)# do confirm                             Save the configuration
  
```

Since VLAN (e.g. 4000) will be used for chassis management, you have to add it into the PP4X configuration. (See Paragraph 4 PP4X Board VLAN Configuration.)

4 PP4X BOARD VLAN CONFIGURATION

```

MA4000# configure terminal                               Enter the configuration mode
MA4000(config)# vlan 2149,2349,30,3149                 Add all required VLANs
MA4000(vlan-2149,2349,30,3149)# tagged slot-channel 0-15 Transmit tagged
                                                         to all slot ports
MA4000(vlan-2149,2349,30,3149)# tagged front-port 1/1 Receive the traffic into
                                                         VLAN from 1/1 front-port

For port-channel

MA4000(vlan-2149,2349,30,3149)# tagged port-channel 1 Receive the traffic into
                                                         VLAN from
                                                         port-channel 1

Configuration of mng VLAN for management

MA4000(config)# vlan 4000
MA4000(vlan-4000)# tagged front-port 1/1              Receive the traffic into
                                                         VLAN from 1/1 front-port

MA4000(vlan-4000)# exit
MA4000(config)# do commit                             Apply the configuration
MA4000(config)# do confirm                             Save the configuration
  
```

Use **show running config** command to view the running MA4000 configuration:

```

MA4000# show running-config                             View the current configuration
  
```

5 CONFIGURATION OF SNMP AND SNTP SERVICES

5.1 SNMP configuration

```

MA4000# configure terminal          Enter the configuration mode
MA4000(config)# ip snmp agent enable Address of TFTP server for backup
MA4000(config)# ip snmp agent traps trapsv2 192.168.205.101 Configure sending traps
MA4000(config)# ip snmp agent traps trapsv2 192.168.205.101 Configure sending
                                                                    informs
MA4000(config)# ip snmp agent system name MA4000 Assign the system name
MA4000(config)# do commit          Apply the configuration
MA4000(config)# do confirm         Confirm the configuration

```

5.2 SNTP configuration

```

MA4000# configure terminal          Enter the configuration mode
MA4000(config)# ip sntp client      Enable NTP service
MA4000(config)# ip sntp server 192.168.205.50 Define NTP server address
MA4000(config)# ip sntp poll-period 1000 Configure the Poll period
MA4000(config)# do commit          Apply the configuration
MA4000(config)# do confirm         Confirm the configuration

```

6 AUTOMATIC CONFIGURATION UPLOAD SETTINGS

To enable automatic configuration upload to the remote server, you should enter the configuration mode using **configure terminal** command. You can configure two automatic configuration upload methods—on time or on configuration change.

```

MA4000# configure terminal          Enter the configuration mode
MA4000(config)# backup path tftp://192.168.205.100 Address of TFTP server for backup
MA4000(config)# backup ontimer      Enable the backup upload
                                                                    to the remote server on time
MA4000(config)# backup ontimer-period 86400 86400 seconds timer
MA4000(config)# backup onchange     Enable the backup upload
                                                                    to the remote server on
                                                                    configuration change
MA4000(config)# do commit          Apply the configuration
MA4000(config)# do confirm         Confirm the configuration

```

7 IGMP CONFIGURATION

```

MA4000# configure terminal          Enter the configuration mode
MA4000(config)# ip igmp snooping enable Enable IGMP SNOOPING globally
MA4000(config)# ip igmp unregistered ip4-mc drop Drop the multicast traffic
                                                                    for unregistered groups
MA4000(config)# vlan 30            VLAN 30 configuration mode
MA4000(vlan-30)# ip igmp snooping enable Enable IGMP SNOOPING in the
                                                                    multicast VLAN
MA4000(vlan-30)# ip igmp snooping querier enable Enable IGMP PROXY in the multicast
                                                                    VLAN
MA4000(vlan-30)# do commit          Apply the configuration
MA4000(vlan-30)# do confirm         Confirm the configuration

```

8 LACP CONFIGURATION

```

MA4000# configure terminal           Enter the configuration mode
MA4000(config)# interface port-channel 1      Select the port-channel
MA4000(express-config-port-channel-1)# mode lacp      Select the port-channel operation
                                                    mode
MA4000(express-config-port-channel-1)# exit
MA4000(config)# interface front-port 1/3-4
MA4000(front-port-1/3-4)# channel-group 1 force      Add the required ports into the
                                                    group
MA4000(front-port-1/3-4)# exit
MA4000(config)# vlan 2149
MA4000(vlan-2149)# tagged port-channel 1          Select the current Port-Channel for
                                                    the specific VLANs
MA4000(vlan-2149)# exit
MA4000(config)# do commit                Apply the configuration
MA4000(config)# do confirm                Confirm the configuration

```

9 ADDING PLC8 BOARDS

To add the periphery boards into the configuration, you should enter the configuration mode using **configure terminal** command.

```

MA4000# configure terminal           Enter the configuration mode
MA4000(config)# slot 3 type plc8      Add PLC8 for slot 3
MA4000(config)# do commit            Apply the configuration
MA4000(config)# do confirm           Confirm the configuration
MA4000(config)# do show shelf        View the board state in the shelf

Shelf status
~~~~~
Slot  Configured Type  Detected Type  Version  Serial #  Link State  Slot State
-----
0      none               none           0.0.0.0
1      none               none           0.0.0.0
2      plc8                plc8           3 24 0 452 OL04000222 up           Operational
3      plc8                plc8           3 24 0 452 OL04000039 up           Operational
4      none               none           0.0.0.0
5      none               none           0.0.0.0
6      none               none           0.0.0.0
7      plc8                plc8           3 24 0 452 OL04000901 up           Operational
8      none               none           0.0.0.0
9      none               none           0.0.0.0
10     none               none           0.0.0.0
11     none               none           0.0.0.0
12     none               none           0.0.0.0
13     none               none           0.0.0.0
14     none               none           0.0.0.0
15     none               none           0.0.0.0
MA4000(config)#

```


10 CONFIGURATION CROSS-CONNECT AND PORTS PROFILES FOR ONT

Configuration of cross-connect profiles

```

MA4000(config)# profile cross-connect INET          Create and go to the
                                                    Cross-Connect profile for ONT
                                                    Internet service
MA4000(config-cross-connect) ("INET")# outer vid 2149 Define the service VLAN for
                                                    Internet service
MA4000(config-cross-connect) ("INET")# user vid 10  Define the internal VLAN for
                                                    Internet service in ONT
MA4000(config-cross-connect) ("INET")# exit
MA4000(config)# profile cross-connect VOIP        Create and go to the Cross-
                                                    Connect profile for ONT SIP VoIP
                                                    service
MA4000(config-cross-connect) ("VOIP")# outer vid 3149 Define the service VLAN for
                                                    VoIP service
MA4000(config-cross-connect) ("VOIP")# user vid 12  Define the internal VLAN for
                                                    VoIP service in ONT
MA4000(config-cross-connect) ("VOIP")# exit
MA4000(config)# profile cross-connect MC_IPTV    Create and go to the
                                                    Cross-Connect profile for
                                                    multicast service
MA4000(config-cross-connect) ("MC_IPTV")# outer vid 30 Define the service VLAN for
                                                    multicast service
MA4000(config-cross-connect) ("MC_IPTV")# user vid 30 Define the internal VLAN for
                                                    multicast in ONT
MA4000(config-cross-connect) ("MC_IPTV")# type multicast Define the multicast service
                                                    type
MA4000(config-cross-connect) ("MC_IPTV")# exit
MA4000(config)# profile cross-connect UC_IPTV    Create and go to the Cross-
                                                    Connect profile for ONT UC_IPTV
                                                    service
MA4000(config-cross-connect) ("UC_IPTV")# outer vid 2349 Define the service VLAN for
                                                    STB unicast service
MA4000(config-cross-connect) ("UC_IPTV")# user vid 11 Define the internal VLAN for
                                                    STB unicast service in ONT
MA4000(config-cross-connect) ("UC_IPTV")# exit
MA4000(config)# profile cross-connect ACS        Create and go to the Cross-
                                                    Connect profile for ONT
                                                    management service
MA4000(config-cross-connect) ("ACS")# outer vid 4094 Define the service VLAN for
                                                    management service
MA4000(config-cross-connect) ("ACS")# user vid untagged Define the internal VLAN for
                                                    management service in ONT
MA4000(config-cross-connect) ("ACS")# type management Define the management service
                                                    type
MA4000(config-cross-connect) ("ACS")# exit

```

Configuration of ports profile

```

MA4000(config)# profile ports NTP-RG            Create and go to the multicasting
                                                    profile
MA4000(config-ports) ("NTP-RG")# veip multicast  Enable IGMP Proxy on veip
                                                    interface NTP
MA4000(config-ports) ("NTP-RG")# veip upstream vid 30 IGMP traffic mapping
                                                    configuration in VLAN 30
MA4000(config-ports) ("NTP-RG")# veip downstream vid 30 Multicast mapping configuration

```

```

MA4000 (config-ports) ("NTP-RG") # igmp multicast dynamic-entry 0 vid 30 configuration of
                                                                    in VLAN 30
                                                                    the vlan multicast, which
                                                                    receives the range of the
                                                                    following groups
MA4000 (config-ports) ("NTP-RG") # igmp multicast dynamic-entry 0 group 224.0.0.1
239.255.255.255 Multicast groups range
                                                                    configuration
MA4000 (config-ports) ("NTP-RG") # do commit Apply the configuration
MA4000 (config-ports) ("NTP-RG") # do confirm Confirm the configuration

```

11 ADDING AND CONFIGURING ONT

Consider an example of ONT configuration, which is connected to the PLC8 PON port 2, slot 7. You have to add ELTX08001E5D ONT to the configuration with ID=10 and assign all the profiles, required for service provision, to it.

```

MA4000# configure terminal Enter the configuration mode
MA4000 (config) # interface ont 7/2/10
MA4000 (slot-11-pon) # serial ELTX08001E5D Add ONT with PON serial
                                                                    ELTX08001E5D
MA4000 (config) (if-ont-2/10) # profile ports NTP-RG Assign ports NTP-RG profile
MA4000 (config) (if-ont-2/10) # service 0 profile cross-connect INET Assign
                                                                    cross-connect INET profile
MA4000 (config) (if-ont-2/10) # service 1 profile cross-connect VOIP Assign
                                                                    cross-connect VOIP profile
MA4000 (config) (if-ont-2/10) # service 2 profile cross-connect MC_IPTV Assign
                                                                    cross-connect MC_IPTV profile
MA4000 (config) (if-ont-2/10) # service 3 profile cross-connect UC_IPTV Assign
                                                                    cross-connect UC_IPTV profile
MA4000 (config) (if-ont-2/10) # service 4 profile cross-connect ACS Assign
                                                                    cross-connect ACS profile
Assign the default dba profile 'dba-00' to all the used services

MA4000 (config) (if-ont-2/10) # service 0 profile dba dba-00
MA4000 (config) (if-ont-2/10) # service 1 profile dba dba-00
MA4000 (config) (if-ont-2/10) # service 2 profile dba dba-00
MA4000 (config) (if-ont-2/10) # service 3 profile dba dba-00
MA4000 (config) (if-ont-2/10) # service 4 profile dba dba-00
MA4000 (config) (if-ont-2/10) # do commit Apply the configuration
MA4000 (config) (if-ont-2/10) # do confirm Confirm the configuration

```

You have to check all services after the configuration procedure has been performed.

12 CONFIGURATION OF OLT PROFILES—PPPOE Intermedia Agent, DHCP Relay Agent

12.1 PPPoE Intermedia Agent Configuration

```

MA4000# configure terminal          Enter the configuration mode
MA4000 (config)# profile pppoe-ia pppoe  Add a new profile
MA4000 (config-pppoe-ia) ("pppoe")# enable  Enable Agent
MA4000 (config-pppoe-ia) ("pppoe")# sessions-limit 8192  Define the maximum quantity of
                                                                PPPoE sessions for the profile
MA4000 (config-pppoe-ia) ("pppoe")# sessions-limit per-user 4  Define the maximum
                                                                quantity of PPPoE sessions per ONT
MA4000 (config-pppoe-ia) ("pppoe")# format circuit-id %HOSTNAME%%ONTID%  Define
                                                                circuit_id format
MA4000 (config-pppoe-ia) ("pppoe")# format remote-id %HOSTNAME%%ONTID%  Define
                                                                remote_id format
MA4000 (config-pppoe-ia) ("pppoe")# do commit  Apply the configuration
MA4000 (config-pppoe-ia) ("pppoe")# do confirm  Confirm the configuration
MA4000 (config-pppoe-ia) ("pppoe")# exit
MA4000 (config)# slot 7 profile pppoe-ia pppoe  Assign pppoe profile for slot 7
MA4000 (config)# do commit  Apply the configuration
MA4000 (config)# do confirm  Confirm the configuration

```

12.2 DHCP Relay Agent Configuration

```

MA4000# configure terminal          Enter the configuration mode
MA4000 (config)# profile dhcp-ra dhcp  Add and go to DHCP profile
                                                                configuration
MA4000 (config-dhcp-ra) ("dhcp")# enable  Enable Agent
MA4000 (config-dhcp-ra) ("dhcp")# overwrite-option82 circuit-id %HOSTNAME%%ONTID%  Send
                                                                the MA4000 HOSTNAME and ONT id in
                                                                information on the port that
                                                                forwarded the request to DHCP
                                                                relay
MA4000 (config-dhcp-ra) ("dhcp")# overwrite-option82 remote-id %HOSTNAME%%ONTID%  Send
                                                                the MA4000 HOSTNAME and ONT id in
                                                                the DHCP relay identifier
MA4000 (config-dhcp-ra) ("dhcp")# do commit  Apply the configuration
MA4000 (config-dhcp-ra) ("dhcp")# do save  Save the configuration
MA4000 (config-dhcp-ra) ("dhcp")# do show profile dhcp-ra dhcp  View the configuration
                                                                of the profile
MA4000 (config)# slot 7 profile dhcp-ra dhcp  Assign dhcp profile to the slot 7
                                                                globally
MA4000 (config)# slot 7 profile dhcp-ra_1 dhcp vlan 3149  Assign dhcp_1 profile to
                                                                VLAN 3149
MA4000 (config)# do commit  Apply the configuration
MA4000 (config)# do confirm  Confirm the configuration
MA4000# show slot 7 gpon olt configuration  View the slot 7 configuration
Profile pppoe-ia: pppoe          OLT Profile PPPoE Intermediate Agent 2
Profile dhcp-ra: dhcp          OLT Profile DHCP Relay Agent 2
Profile dhcp-ra per VLAN 3149 [0]:
    Profile: dhcp_1          OLT Profile DHCP Relay Agent 3

```

In this configuration, for all VLANs, except for 3149, the DHCP Relay Agent profile 0 will be used.



PPPoE Intermedia Agent and DHCP Relay Agent settings will take effect after the OLT chip is reconfigured.

```
MA4000# reconfigure olt slot 7 device 0           Reconfigure OLT chip 0
OLT successfully reconfigured.
```

13 MA4000-PX FIRMWARE UPDATE

Given below are the example of a new firmware version installation.

Source data:

- Firmware file is located on the TFTP server
- TFTP server IP address 192.168.205.100

1. Copy the firmware file located on the external TFTP server into the flash memory of both devices.

```
MA4000# copy tftp://192.168.205.100/firmware.3.24.0.452.ma4k fs://firmware
Source:
Protocol: 'tftp'
Hostname: '192.168.205.100'
Path: 'firmware.3.24.0.452.ma4k'
Filename: 'firmware.3.24.0.452.ma4k'
Destination:
Protocol: 'fs'
Kind: container
Copying file from host 192.168.205.100, remote path firmware.3.24.0.452.ma4k...
Copying file: done (rc 0).
Installing firmware, please wait...
Firmware installation finished.
Skip 'slave' stage.
MA4000#
```

2. Configure the inactive firmware file as active.

```
MA4000# firmware select image-alternate unit 1
WARNING: operations with concrete unit aren't safe !!!
Set image 0 as active on unit 1? (y/N) y
Verifying image 0 on unit 1, please wait...
Updating unit 1...
Firmware image 0 on unit 1 has been selected as the active image.
When the unit is booted next time, it will use image 0.
You will need to confirm that the active image on the unit is working properly
by entering 'firmware pp4x confirm unit 1' command.
If the command will not be entered in 10 minutes after the unit has booted,
the unit will automatically reboot,
and image 1 will be selected as the active image.
Request complete.
MA4000# firmware select image-alternate unit 2
WARNING: operations with concrete unit aren't safe !!!
Set image 0 as active on unit 2? (y/N) y
Verifying image 0 on unit 2, please wait...
Updating unit 2...
Firmware image 0 on unit 2 has been selected as the active image.
When the unit is booted next time, it will use image 0.
You will need to confirm that the active image on the unit is working properly
by entering 'firmware pp4x confirm unit 2' command.
```

If the command will not be entered in 10 minutes after the unit has booted, the unit will automatically reboot, and image 1 will be selected as the active image.
Request complete.

MA4000# **show firmware**

Firmware status:

```

~~~~~
Unit  Image  Running  Boot          Version          Date
----  -
1     0       Yes      FALLBACK     1 3 2 323 40564  20-Oct-2014 20:12:02
1     1       No       NOT TESTED*  3 24 0 452 44381  27-Nov-2015 22:06:45
2     0       No       NOT TESTED*  3 24 0 452 44381  27-Nov-2015 22:06:45
2     1       Yes      FALLBACK     1 3 2 323 40564  20-Oct-2014 20:12:02

```

"*" designates that the image was selected for the next boot

MA4000#

3. Reboot devices with updated firmware.

Firmware update has been performed on both devices, thus you should reboot both devices with the **reboot system** command:

MA4000# MA4000# **reboot system**

Do you really want to reload system ? (y/n) y

MA4000#

4. Make sure, that the firmware update has been completed successfully.

Check the flash memory contents with the **show firmware** command:

MA4000# **show firmware**

Firmware status:

```

~~~~~
Unit  Image  Running  Boot          Version          Date
----  -
1     0       No       FALLBACK*     1 3 2 323 40564  20-Oct-2014 20:12:02
1     1       Yes      TESTING       3 24 0 452 44381  27-Nov-2015 22:06:45
2     0       Yes      TESTING       3 24 0 452 44381  27-Nov-2015 22:06:45
2     1       No       FALLBACK*     1 3 2 323 40564  20-Oct-2014 20:12:02

```

"*" designates that the image was selected for the next boot

5. Confirm the successful completion of the firmware update with the **firmware confirm** command:

MA4000# **firmware confirm**

Request complete.

MA4000# **show firmware**

Firmware status:

```

~~~~~
Unit  Image  Running  Boot          Version          Date
----  -
1     0       No       *              1 3 2 323 40564  20-Oct-2014 20:12:02
1     1       Yes      *              3 24 0 452 44381  27-Nov-2015 22:06:45
2     0       Yes      *              3 24 0 452 44381  27-Nov-2015 22:06:45
2     1       No       *              1 3 2 323 40564  20-Oct-2014 20:12:02

```

"*" designates that the image was selected for the next boot