



Upgrading Firmware on an ADTRAN Netvanta 160 Series Unit in Recovery Mode

When an ADTRAN Netvanta 160 series access point (AP) is in need of firmware, it will enter a mode called “Recovery.” Recovery mode is similar to “Bootstrap” mode in AOS. The Recovery state can be viewed from the Command Line Interface (CLI) or the Web Interface, both shown below.

CLI

```
NV6355(config)#do show dot11ap access-point
Wireless Access Points:
Name                MAC-Address        AP Status  Mod  Type  Control Status
-----
ADTN0B0200         00:19:92:0B:02:00  Recovery  N   NV160  Seeking Control
```

Web Interface

- System
- Voice
- Data
 - Switch
 - Ports
 - Power Over Ethernet
 - Port Authentication
 - Port Security
 - Storm Control
 - Link Aggregation
 - VLANs
 - Spanning Tree
 - MAC Forwarding
 - Class Of Service
 - Stacking
 - Port Scheduler
 - Router / Bridge
 - Default Gateway
 - Routing
 - Route Table
 - IP Interfaces
 - Loopback Interfaces
 - GRE Tunnels
 - QoS Wizard
 - QoS Maps
 - Bridging
 - UDP Relay
 - Demand Routing
 - VRRP
 - Firewall
 - Firewall Wizard
 - Firewall / ACLs
 - Security Zones
 - Wireless
 - AC / AP Discovery

Access Controller

Enabling the Access Controller allows detection of all possible Access Points.

Access Controller: *Enables Access Controller.*

Dynamically Discovered Access Points

The list below contains all of the access points (APs) detected by the access controller. For non-configured APs, click on the 'Wizard' button for configuration. After the AP is setup, the 'Wizard' button will be hidden. To modify an existing AP, or to add a new AP, go to the [APs/Radios/Vaps](#) page.

Name	MAC Address	Status	Control Status	
ADTN0B0200 (NV160)	00:19:92:0B:02:00	Recovery	Seeking control	
techsupport161 (NV160)	00:19:92:0E:BC:40	Session	Controlled by this AC	
ADTN29CF70 (NV150)	00:A0:C8:29:CF:70	Session	Controlled by another AC	<input type="button" value="Wizard"/>

Refresh in 3 seconds...

To get an AP out of recovery mode, new firmware must be installed on the AP. To upgrade the firmware, download NetVanta 160/161 firmware from the ADTRAN website [here](#). This firmware will need to be placed on an accessible TFTP server within your network. The AOS Access Controller (AC) itself can also act as the TFTP server to simplify the process.

Once you have loaded the proper firmware file onto the TFTP server, network connectivity will need to be established from the TFTP server to the AP. This can be done in two ways. In Recovery mode, the AP can be upgraded using the ADTRAN command line or Web Interface with a temporary I. If this is not available or is not functioning, the AP has a default IP address of 192.168.190.1/24.

When utilizing the temporary IP, this IP will need to be in the same subnet range the AC is using to control the AP (Basically if the AP is being controlled in the native VLAN 1, you must give it a temporary VLAN 1 IP). If attempting this method, proceed to **Initiating the Upgrade from the AOS CLI**. (Note: This method is slightly less reliable since the IP address is applied in the same procedure the the upgrade command is sent. If the AP experiences a problem applying the IP, the firmware upgrade will fail. Attempting this method first is preferred, but on successive failures to upgrade, use the default recovery IP.)

If choosing to utilize the default IP for this (this is more stable because the IP is permanent instead of being applied during the process), this subnet must be made routable inside of the network in which the AP, TFTP server, and controller reside. A simple way to achieve this is to add a temporary VLAN to your network.

The port the AP is connected to will need to be an access port inside of that 192.168190.0/24 VLAN and the VLAN needs to be able allowed on all trunk ports in between the AP, the controller, and TFTP server (Trunk ports allow all VLANs by default. This is only applicable if you have applied the **switchport trunk allowed vlan** command to trunk ports). The VLAN will also need to be configured in all switches between the entities as well. For example:

1. Create VLAN 100 for the 192.168.190.0 /24 subnet on the controller.

```
(config)# interface vlan 100
(config-int)# ip address 192.168.190.2 255.255.255.0
(config-int)# no shutdown
```

2. Configure the port the AP is plugged into as an access port in the desired VLAN (VLAN 100, Port 19 in this example):

```
(config)# interface sw 0/19
(config-int)# no shutdown
(config-int)# switchport access vlan 100
```

3. Assigning a switchport to an access port will automatically allow that switch to pass traffic for that access VLAN, but any other switches in between the access switch and the destination, must also be able to interpret traffic from that VLAN. To create the new VLAN (VLAN 100) in all of the switches between the controller, TFTP server, and the AP, enter the following command from each switch:

```
(config)# vlan 100
```

If would rather do the above steps using the AOS Web Interface, please see the [Configuring InterVLAN Routing in AOS](#) document.

Once this has been accomplished, attempt to ping the AP from the TFTP server to make sure connectivity can be established. If connectivity is successful, you can complete the upgrade from the CLI or the Web Interface as detailed below. If connectivity is not established, troubleshoot the VLAN configuration using the above commands and the [Configuring InterVLAN Routing in AOS](#) document.

Initiating the Upgrade from the AOS CLI

This section explains initiating the upgrade from the AOS CLI. For instructions on using the Web Interface to accomplish this, please see the **Initiating the upgrade from the AOS Web Interface** section below.

In the CLI of the AP controller, you can initiate the firmware upgrade with the following commands:

```
# copy tftp dot11ap interface <#>
```

The “#” will correspond to the interface configuration of the AP itself. This will not be in terms of sub-interfaces or radios, so it will always be an integer.

After pressing enter, the CLI prompt will ask for a TFTP server IP address:

TFTP server IP address (A.B.C.D):

Enter the IP address of your TFTP server and press enter (If you are using the controller as the TFTP server, enter the local IP address of the unit that you want to use as the source IP address for the transfer). It will prompt for the firmware filename. Enter it here:

Firmware filename:

Now press enter. It will then prompt for access point IP address, subnet mask, and default gateway:

Access point IP address (A.B.C.D):

Access point subnet mask (A.B.C.D or /1-31) [/24]:

Access point default gateway (A.B.C.D) [none]:

After entering this information, it will ask for the TFTP download timeout in minutes. Press enter to leave it at a default of 10 or enter a new value and press enter. :

TFTP download timeout in minutes (0-10) [10]:

Once this has been entered, the controller will warn the user that this will interrupt wireless activity:

Note: Downloading and upgrading AP firmware will take several minutes. Please do not remove power to the AP or AC (this unit) during this process. Once begun, Ctrl-C may be used to attempt to halt this process, but there is not a guarantee the AP will respond to the abort during the firmware upgrade process.

Warning: The firmware upgrade process is service affecting. Clients associated with this AP will lose connectivity until the upgrade completes.

Do you want to proceed? (yes/no)

After the decision has been made to proceed, the AP will be contacted and the firmware upgrade process will begin, as referenced by the events below:

Sending upgrade command to AP.

AP booting to manufacturing partition. Awaiting recontact.

Downloading firmware image complete.

Validating firmware image.

Firmware image validation complete.

Writing firmware image.

Firmware image written.

AP booting new image.

Awaiting recontact.

Once the AP has re-established connectivity with the controller, your AP should look like this:

```
NV6355(config)#do show dot11ap access-point
Wireless Access Points:
Name                MAC-Address        AP Status  Mod  Type  Control Status
-----            -
ADTN0B0200         00:19:92:0B:02:00  Session   N   NV160  Ctl by This AC
```

If the upgrade fails or the AP still shows in recovery mode, please see the section titled “Troubleshooting your Netvanta160/161 Upgrade”.

Initiating the upgrade from the AOS Web Interface

Inside the Web Interface, navigate to Data->Wireless->AP Firmware as shown below

Access Point Firmware Upgrade

Select the Access Point to upgrade. Once selected enter ALL of the requested information. Verify the upgrade with the Upload Status. After a successful upload the AP will then reboot. During this time the upload status will reflect 'Not Ready for Upload'. If upgrading a NV16X, depending upon where the TFTP server is located the upgrade may take several minutes to several hours. Because the upgrade of the NV150 comes from the AC, the upgrade should finish in several minutes. Do not remove power to the AP or AC during this process.

Warning: The firmware upgrade process is service affecting. Clients associated with this AP will lose connectivity until the upgrade completes.

Access Point: *Specify the 'Access Point' to receive the image.*

Firmware Image: *Firmware image to send to the Access Point.*

Timeout: *Upgrade will end if not successful in the time specified. (Range 0-10 minutes)*

TFTP Server: . . . *IP Address of TFTP server used to send firmware image.*

AP IP Address: . . . *Configure an IP address for the AP to use during upgrade*

AP Subnet Mask: . . . *Configure subnet mask for the AP to use during upgrade.*

AP Gateway: . . . *Configure gateway to use to upgrade AP. (optional)*

Upload Status: Upgrade Timeout

Select the applicable access point. Inside the “Firmware Image” box, copy the exact name of the image. This is case sensitive.

Continue by specifying the TFTP server, the AP IP address (the temporary one you chose or 192.168.190.1), AP subnet mask, and AP Gateway.

Once done, press the “Apply” button to initiate the upgrade. The status of the upgrade will be present in the “Upload Status” section during the process.

If you are going to use the AOS access controller as the TFTP server, you can upload an image on the same page in the Firmware Image section:



In this case, when you fill out the Access Point Firmware Upgrade section, use the IP address for the controller (the interface that is in the same subnet as your AP) as the TFTP server IP address. This automatically enables the TFTP server on your unit so it does not need to be manually enabled prior to initiating the upgrade.

Troubleshooting Netvanta160 Series Upgrade

To troubleshoot a NetVanta 160 series unit that is not upgrading properly you must access the controller via the CLI.

TFTP Server Unreachable

One of the most common problems is the AP not establishing connectivity to the TFTP server. If this happens, you may see this event:

Sending upgrade command to AP.

AP booting to manufacturing partition. Awaiting recontact.

Unreachable TFTP server or FW image not available on server.

In this case, make sure you have connectivity from the TFTP server to the AP by pinging the AP. If you do not, please return to the beginning of the document and follow the proper configuration steps to configure the 192.168.190.0/24 subnet in your equipment.

No Control Session to AP

If the AP does not have an established control session, you will see the following event if you try to initiate an upgrade:

No control session to AP.

In this case, the Controller cannot establish an AWCP session to this AP. The **show dot11 access-points** command can be used to see if the AP is reachable.

```
NV6355(config)#do show dot11 access-points
Wireless Access Points:
Name                MAC-Address        AP Status  Mod  Type  Control Status
-----            -
ADTN0B0200         00:19:92:0B:02:00  Recovery  N   NV160  Ctl by This AC
```

If the AP in question does not show up in this command's output, check your Layer 2 VLAN configuration between the controller and the AP.

Upgrade Currently Underway.

If you receive the following error:

Error: Upgrade currently underway.

This means that another AP upgrade has been initiated and is ongoing. Only one AP can be upgraded at a time.

Debugging an AP Upgrade

To see verbose information about the upgrade of an AP, you can use the **debug dot11 firmware-upgrade** command. An example of a successful upgrade is shown below:

```
2000.12.18 13:42:40 DOT11.FIRMWARE_UPGRADE Upgrade Agent: Sent upgrade command to
AP 00:19:92:0F:70:40
```

```
2000.12.18 13:42:40 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from
BSAP_FW_UPGRADE_STATUS_INIT to
BSAP_FW_UPGRADE_STATUS_SENDING_UPGRADE_COMMAND_TO_AP
```

Sending upgrade command to AP

```
2000.12.18 13:42:40 DOT11.FIRMWARE_UPGRADE Upgrade Agent: Got upgrade command
response from AP 00:19:92:0F:70:40
```

```
2000.12.18 13:42:41 DOT11.FIRMWARE_UPGRADE Upgrade Agent: Sent upgrade information
to AP 00:19:92:0F:70:40
```

2000.12.18 13:42:42 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from BSAP_FW_UPGRADE_STATUS_SENDING_UPGRADE_COMMAND_TO_AP to BSAP_FW_UPGRADE_STATUS_SENT_CMD_AWAITING_FOR_REDISCOVERY
AP booting to manufacturing partition. Awaiting recontact.

2000.12.18 13:43:05 INTERFACE_STATUS.giga-swx 0/19 changed state to down

2000.12.18 13:43:08 INTERFACE_STATUS.giga-swx 0/19 changed state to up

2000.12.18 13:43:38 DOT11.FIRMWARE_UPGRADE Rx TLV:

SENT_REQUEST_AWAITING_RECONTACT.ICP_COMMAND_AP_STATUS

2000.12.18 13:43:38 DOT11.FIRMWARE_UPGRADE Rx TLV:

SENT_REQUEST_AWAITING_RECONTACT.ICP_COMMAND_AP_VERSION

2000.12.18 13:43:38 DOT11.FIRMWARE_UPGRADE Rx TLV:

SENT_REQUEST_AWAITING_RECONTACT.ICP_COMMAND_DISCOVERED_AP_TYPE

2000.12.18 13:43:38 DOT11.FIRMWARE_UPGRADE State Transition: from

SENT_REQUEST_AWAITING_RECONTACT to RECIEVING_FW_UPGRADE_STATUS_UPDATES

2000.12.18 13:43:39 DOT11.FIRMWARE_UPGRADE State Transition: from

RECIEVING_FW_UPGRADE_STATUS_UPDATES to IN_PROGRESS

2000.12.18 13:43:40 DOT11.FIRMWARE_UPGRADE Upgrade Agent: Starting TFTP download to AP 00:19:92:0F:70:40

2000.12.18 13:43:40 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from

BSAP_FW_UPGRADE_STATUS_SENT_CMD_AWAITING_FOR_REDISCOVERY to

BSAP_FW_UPGRADE_STATUS_DOWNLOAD_IN_PROGRESS

AP Download Beginning

AP downloaded 8864256 bytes.

2000.12.18 13:44:11 DOT11.FIRMWARE_UPGRADE AP successfully downloaded firmware (file size 9201152)

2000.12.18 13:44:11 DOT11.FIRMWARE_UPGRADE Rx TLV:

TLV_VALIDATING_FW_IN_PROGRESS

2000.12.18 13:44:12 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from

BSAP_FW_UPGRADE_STATUS_DOWNLOAD_IN_PROGRESS to

BSAP_FW_UPGRADE_STATUS_VALIDATING_FW_IN_PROGRESS

2000.12.18 13:44:12 DOT11.FIRMWARE_UPGRADE Rx TLV:

TLV_VALIDATING_FW_IN_PROGRESS

Downloading firmware image complete.

Validating firmware image.

2000.12.18 13:44:13 DOT11.FIRMWARE_UPGRADE Validation complete. No errors

2000.12.18 13:44:13 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from BSAP_FW_UPGRADE_STATUS_VALIDATING_FW_IN_PROGRESS to BSAP_FW_UPGRADE_STATUS_VALIDATING_FW_COMPLETED
Firmware image validation complete.
Writing firmware image.

2000.12.18 13:44:21 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from BSAP_FW_UPGRADE_STATUS_VALIDATING_FW_COMPLETED to BSAP_FW_UPGRADE_STATUS_FLASHING_FW_IN_PROGRESS

2000.12.18 13:46:11 DOT11.FIRMWARE_UPGRADE Flashing firmware complete. No errors

2000.12.18 13:46:11 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from BSAP_FW_UPGRADE_STATUS_FLASHING_FW_IN_PROGRESS to BSAP_FW_UPGRADE_STATUS_SUCCESS

An unsuccessful upgrade due to the TFTP server not being reachable is shown below:

2012.10.19 09:41:18 DOT11.FIRMWARE_UPGRADE Upgrade Agent: Sent upgrade command to AP 00:19:92:0B:02:00

2012.10.19 09:41:18 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from BSAP_FW_UPGRADE_STATUS_INIT to BSAP_FW_UPGRADE_STATUS_SENDING_UPGRADE_COMMAND_TO_AP

2012.10.19 09:41:18 DOT11.FIRMWARE_UPGRADE Upgrade Agent: Got upgrade command response from AP 00:19:92:0B:02:00
Sending upgrade command to AP.

2012.10.19 09:41:19 DOT11.FIRMWARE_UPGRADE Upgrade Agent: Sent upgrade information to AP 00:19:92:0B:02:00

2012.10.19 09:41:20 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from BSAP_FW_UPGRADE_STATUS_SENDING_UPGRADE_COMMAND_TO_AP to BSAP_FW_UPGRADE_STATUS_SENT_CMD_AWAITING_FOR_REDISCOVERY
AP booting to manufacturing partition. Awaiting recontact.

2012.10.19 09:42:21 DOT11.FIRMWARE_UPGRADE TX Download Cancel to AP
2012.10.19 09:42:21 DOT11.FIRMWARE_UPGRADE Upgrade Agent: State Transition: from
BSAP_FW_UPGRADE_STATUS_SENT_CMD_AWAITING_FOR_REDISCOVERY to
BSAP_FW_UPGRADE_STATUS_FAIL_SESSION_TIMEOUT

If the AP is still not able to be upgraded or you are still having other issues after consulting this document, please contact Adtran Technical Support at 1-888-4-ADTRAN.