



DHCP FAQ

How does the DHCP server work?

Issuance – When a DHCP request is received, the NSE will look up the next available lease in its list. Next, the NSE checks to see if this address is present in the Current Subscribers list, offering that address if not found. When present the NSE will hold this lease for five minutes before trying to issue that lease. If this hold occurs, the NSE will go to the next lease in the list and run this process again.

Expiration - When a lease expires, it is marked for cleanup by the NSE, which is then processed by the DHCP Cleanup routine. .

DHCP Cleanup – When this routine executes it checks to see if the number of leases in use is greater than one-half of the total number of leases. If it is, then the routine will remove the leases marked for cleanup.

For example:

If a location had an address pool of just 10 IP addresses, say 10.0.0.1 to 10.0.0.10, when the number of DHCP leases is greater than $10 / 2 = 5$, the DHCP Cleanup will remove old entries.

How do I view the currently allocated DHCP leases?

These can be viewed in the Subscriber Administration/DHCP Leases screen.



How many leases should I configure?

To allow for personal devices requesting IP addresses the maximum amount should be configured. AG 2400/5600/5800 v8.2 allows up to 10,000 leases, v8.3 will support up to 25,000.

Version 8.2

Currently Allocated DHCP Leases

Index	IP Address	MAC Address	Lease Status	Time Remaining
1	10.0.0.12	70:5A:B6:A0:D5:31	Leased	23:45:20

Counts: Active=1, Expired=0, Offered=0, Lapsed Offers=0, Conflicts=0

Version 8.1 and earlier

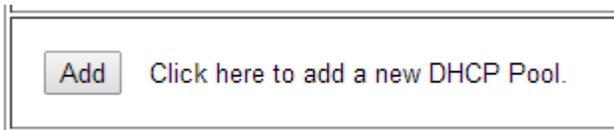
Currently Allocated DHCP Leases

Index	IP Address	MAC Address
1	10.0.0.12	68:5B:35:80:62:06
2	10.0.0.13	64:31:50:11:98:A2



How to add a DHCP pool

Navigate to Configuration/DHCP and click on 'Add' to create a new pool.



Enter information to create the pool and select 'Add' to create the pool or 'Add Pool to add Options' to save the pool and have the ability to add Options.

Add DHCP Pools

DHCP Server IP	<input type="text" value="192.168.1.1"/>	
DHCP Server Netmask	<input type="text" value="255.255.255.0"/>	
DHCP Pool Start IP	<input type="text" value="192.168.1.10"/>	Note: Please make sure pools do not overlap.
DHCP Pool Stop IP	<input type="text" value="192.168.1.20"/>	
DHCP Lease Minutes	<input type="text" value="30"/>	
Router:	<input checked="" type="radio"/> DHCP Server IP <input type="radio"/> Specify: <input type="text"/>	
	<input type="radio"/> Public Pool <input checked="" type="radio"/> Private Pool <input type="checkbox"/> IP Upsell Pool <input type="checkbox"/> Default Pool	
	<input type="button" value="Add Pool"/> <input type="button" value="Add Pool to add options"/>	

Enter the Options information and click Add Option to create an option in the list.

Additional DHCP Options

Add/Modify an option: (Data may be entered as ASCII text, or in hex format by prefixing with 0x. For hex data expressing 32-bit, 16-bit, or 8-bit integer values, an appropriate number of leading zeroes must be entered).

Code:	<input type="text" value="66"/>	Data:	<input type="text" value="tftpserver.mycompany.com"/>
	<input type="button" value="Add Option"/>		



Next, scroll to the bottom of this screen and click ‘Back to Main DHCP Configuration Page’ to go to the main DHCP page. From here, go to the bottom and check the option to save the changes and Submit to reboot.

Reboot after changes are saved? Yes

Existing DHCP Pools

Server-IP	Server-Netmask	Start-IP	End-IP	Lease	IP Type	IP-Upsell	# Options	
10.0.1.4	255.255.255.0	10.0.1.12	10.0.1.50	1440	PRIVATE	NO	0	* Default Pool
192.168.1.1	255.255.255.0	192.168.1.10	192.168.1.20	30	PRIVATE	NO	1	

Total number of leases: 50

How to modify an existing DHCP pool

Navigate to Configuration/DHCP and click on the pool you wish to modify.

DHCP Settings

DHCP Services Disable

DHCP Relay Enable
 DHCP Server IP
 DHCP Relay Agent IP Note: The NSE's Network IP address is used if 0.0.0.0 is entered

DHCP Server Enable Subnet-based IP-Upsell Note: To enable IP Upsell, make sure your license includes it.
 Forwarded DHCP Client Enable

Existing DHCP Pools

Server-IP	Server-Netmask	Start-IP	End-IP	Lease	IP Type	IP-Upsell	# Options	
10.0.0.4	255.255.255.0	10.0.0.12	10.0.0.50	1440	PRIVATE	NO	0	* Default Pool



NOMADIX

Make the desired changes to the pool and click Modify to change them.

Edit a DHCP Pool

DHCP Server IP	<input type="text" value="10.0.1.4"/>	
DHCP Server Netmask	<input type="text" value="255.255.255.0"/>	
DHCP Pool Start IP	<input type="text" value="10.0.1.12"/>	Note: Please make sure pools do not overlap.
DHCP Pool Stop IP	<input type="text" value="10.0.1.50"/>	
DHCP Lease Minutes	<input type="text" value="1440"/>	
Router:	<input checked="" type="radio"/> DHCP Server IP	<input type="radio"/> Specify: <input type="text"/>
	<input type="radio"/> Public Pool	<input checked="" type="radio"/> Private Pool
	<input type="checkbox"/> IP Upsell Pool	<input checked="" type="checkbox"/> Default Pool
	<input type="button" value="Modify Pool"/>	<input type="button" value="Remove Pool"/> Add a new pool

Next, scroll to the bottom of this screen and click 'Back to Main DHCP Configuration Page' to go to the main DHCP page. From here, go to the bottom and check the option to save the changes and Submit to reboot.

Reboot after changes are saved? Yes



Subnet-Based DHCP – This feature allows you to create multiple DHCP pools and assign a user to get a lease from a particular pool either based on the VLAN they are connected to or through authentication.

Subnet-Based DHCP using Vlans – when using this option, you will create a port location table entry for each Vlan you want to assign to a specific DHCP pool and you will set the default DHCP pool configured to hand out leases to users that are connected to any vlan not defined in the port location table.

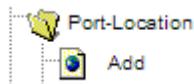
1. Create your DHCP pools – refer to the section **How to add a DHCP pool** above to create each of your individual pools. When all the pools have been created, make sure to click the link [Back to Main DHCP Configuration Page](#). On this page, select Subnet- based

A screenshot of a web interface showing configuration options for a DHCP server. The text "DHCP Server" is on the left. To its right are two checked checkboxes: "Enable" and "Subnet-based".

Then scroll to the bottom of the screen and click Yes to Reboot after changes are saved and Submit.

A screenshot of a confirmation dialog box. It contains the text "Reboot after changes are saved?" followed by a checked checkbox and the word "Yes". Below this are two buttons: "Submit" and "Reset".

2. Create the port location table – Begin by navigating to the Port Location Add screen



3. Enter in the Port (vlan) Information and select the subnet you want to use this vlan.



Process Port-Location Assignments

Location	<input type="text" value="Room 103"/>
Port	<input type="text" value="3"/>
Description	<input type="text" value="Tower 1 1st floor"/>
Subnet	<input type="text" value="172.10.10.0"/>
Default QoS Policy	<input type="text" value="(no policy) ▼"/>

Subnet-Based DHCP using Authentication – When doing subnet-based DHCP through authentication, you will need to set your default pool with a short lease time. Devices will automatically renew its lease when 50% of the lease time has elapsed and when this occurs the AG will give them a lease from the assigned DHCP pool.

Subnet-Based DHCP using the internal database – In the subscriber profile, add the subnet you wish to assign the user to.

Add a Subscriber Profile to the Database

Subscriber **Device** **Group Account**

DHCP Address Type Private Public *Only used if subscriber is configured for DHCP*

MAC Address

IP Address

Subnet

Each time this user connects to the AG, it will receive its lease from the assigned subnet pool.



Subnet-Based DHCP using Radius – You will need to edit your dictionary file to add the Nomadix Vendor Specific Attributes. To use subnet-based DHCP via radius, the following will need to be added to the dictionary file.

Attribute Nomadix-Subnet 6 string

Nomadix-Subnet = "172.10.10.0"

Subnet-Based DHCP for Group Accounts using XML - The following attribute would need to be used in the XML for the group account creation,

<DHCP_SUBNET>172.10.10.0</DHCP_SUBNET>



IP Upsell – This feature allows you to assign DHCP users to receive either a private or public IP address from the designated DHCP pool when they authenticate. In order to use this feature, AAA must be enabled and you will create two DHCP pools, one marked as private and one public.

Step 1: Set the pool (Private) for IP Upsell

Click on private pool Server-IP address, 10.0.0.4 in the example below. Check IP Upsell option and click Modify.

Note: You may change the pool to any other desired network/subnet (192.168.1.0 For example) and click “Modify”

Edit a DHCP Pool

DHCP Server IP	<input type="text" value="10.0.0.4"/>
DHCP Server Netmask	<input type="text" value="255.255.255.0"/>
DHCP Pool Start IP	<input type="text" value="10.0.0.12"/>
DHCP Pool Stop IP	<input type="text" value="10.0.0.250"/>
DHCP Lease Minutes	<input type="text" value="1440"/>
<input type="radio"/> Public Pool <input checked="" type="radio"/> Private Pool <input checked="" type="checkbox"/> IP Upsell Pool <input checked="" type="checkbox"/> Default Pool	

DHCP Options

Router: DHCP Server IP Specify:

Note: Please make sure pools do not overlap.



Step 2: Add a new pool (public)

Enter the IP addresses that are available (not used by any other devices) on your network, specify lease time, check Public Pool and IP Upsell Pool options as it shows on the example below and click Add. Any Device receiving an IP address from this pool will not have their IP address translated.

Add DHCP Pools

DHCP Server IP	<input type="text" value="67.130.149.16"/>		
DHCP Server Netmask	<input type="text" value="255.255.255.0"/>		
DHCP Pool Start IP	<input type="text" value="67.130.149.17"/>		
DHCP Pool Stop IP	<input type="text" value="67.130.149.100"/>		
DHCP Lease Minutes	<input type="text" value="60"/>		
<input checked="" type="radio"/> Public Pool	<input type="radio"/> Private Pool	<input checked="" type="checkbox"/> IP Upsell Pool	<input type="checkbox"/> Default Pool

DHCP Options

Router: DHCP Server IP Specify:

Note: Please make sure pools do not overlap.



Step 3: Complete IP Upsell configuration and reboot

Enable IP Upsell and Subnet-based. Check “Reboot after changes are saved” option and click Submit. The Gateway will reboot.

In the picture below it shows two (2) DHCP pools Private and Public. Both set to IP Upsell (YES)

DHCP Settings

DHCP Services	<input type="checkbox"/> Disable																								
DHCP Relay	<input type="checkbox"/> Enable																								
DHCP Server IP	<input type="text"/>																								
DHCP Relay Agent IP	<input type="text"/>																								
DHCP Server	<input checked="" type="checkbox"/> Enable <input checked="" type="checkbox"/> Subnet-based <input checked="" type="checkbox"/> IP-Upsell Note: To enable IP Upsell, make sure your license includes it.																								
Forwarded DHCP Client	<input type="checkbox"/> Enable																								
<table border="1"><thead><tr><th>Server-IP</th><th>Server-Netmask</th><th>Start-IP</th><th>End-IP</th><th>Lease</th><th>IP Type</th><th>IP-Upsell</th><th></th></tr></thead><tbody><tr><td>10.0.0.4</td><td>255.255.255.0</td><td>10.0.0.12</td><td>10.0.0.250</td><td>1440</td><td>PRIVATE</td><td>YES</td><td>* Default Pool</td></tr><tr><td>67.130.149.16</td><td>255.255.255.0</td><td>67.130.149.17</td><td>67.130.149.100</td><td>60</td><td>PUBLIC</td><td>YES</td><td></td></tr></tbody></table>		Server-IP	Server-Netmask	Start-IP	End-IP	Lease	IP Type	IP-Upsell		10.0.0.4	255.255.255.0	10.0.0.12	10.0.0.250	1440	PRIVATE	YES	* Default Pool	67.130.149.16	255.255.255.0	67.130.149.17	67.130.149.100	60	PUBLIC	YES	
Server-IP	Server-Netmask	Start-IP	End-IP	Lease	IP Type	IP-Upsell																			
10.0.0.4	255.255.255.0	10.0.0.12	10.0.0.250	1440	PRIVATE	YES	* Default Pool																		
67.130.149.16	255.255.255.0	67.130.149.17	67.130.149.100	60	PUBLIC	YES																			
Total number of leases: 323																									
Add	Click here to add a new DHCP Pool.																								

NOTE: You must reboot for configuration changes to take effect.

Reboot after changes are saved? Yes

[Submit](#) [Reset](#)



With IP Upsell, the lease time will be set to match the amount of time purchased for the user and not based on the lease pool setting. If you want the lease time to match the lease time configured for the DHCP pool instead of the service plan, then you will need to disable the “Get lease time from session time” setting. This can only be done through the command line interface. Connect via telnet or the serial interface and go to Configuration then DHCP.

```
Enable/Disable IP Upsell           [enabled  ]:
Get lease time from session time    [enabled  ]: dis
Enable/Disable DHCP Server         [enabled  ]:
Enable/Disable Subnet-based DHCP Service [enabled  ]:
```

```
IP Upsell           Enabled
Get upsell lease time from session time Disabled
DHCP Relay          Disabled
External DHCP Server IP 0.0.0.0
DHCP Relay Agent IP   0.0.0.0
DHCP Server          Enabled
DHCP Server Subnet-based Enabled
```



IP Upsell can be applied to a user profile in the following ways.

Internal Web Server Usernames – when creating the user profile, you can select Private or Public for the DHCP Address Type.

Add a Subscriber Profile to the Database

Subscriber **Device** **Group Account**

DHCP Address Type	Private <input type="radio"/> Public <input checked="" type="radio"/> <small>Only used if subscriber is configured for DHCP</small>
MAC Address	<input type="text"/>
IP Address	<input type="text"/>
Subnet	<input type="text"/>
Username	<input type="text" value="john"/>
Password	<input type="password" value="..."/>
Expiration Time	<input type="text" value="0"/> hrs <input type="text" value="0"/> mins
Paid	USD <input type="text" value="0.00"/>
User Definable 1	<input type="text"/>
User Definable 2	<input type="text"/>
Max Upstream Bandwidth	<input type="text" value="0"/> Kbps
Max Downstream Bandwidth	<input type="text" value="0"/> Kbps
QoS Policy	<input type="text" value="(no policy)"/>
Count-down after Login	<input type="checkbox"/> Enable
SMTP Redirection	<input checked="" type="checkbox"/> Enable <small>Note: Global SMTP Redirection must be enabled for subscriber SMTP Redirection to take effect, see SMTP page under Configuration options</small>



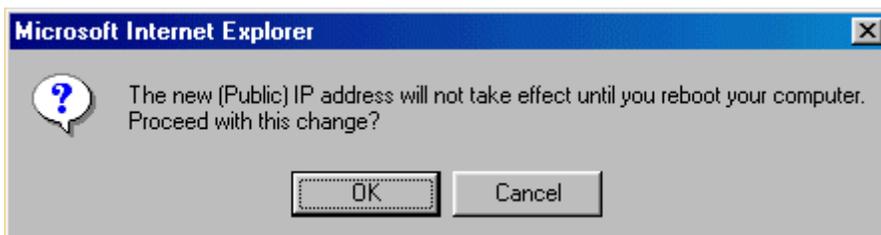
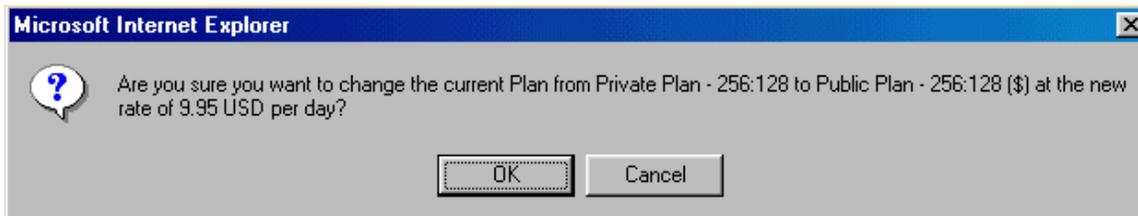
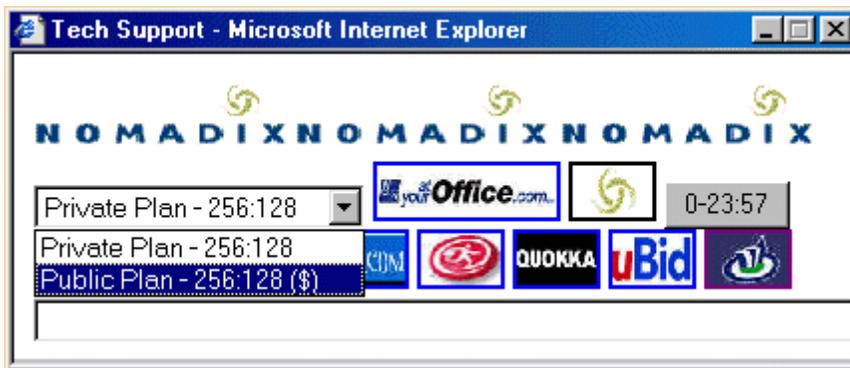
Internal Web Server Billing Options - set for Public and Private Plans

Internal Billing Options Plan Setup		Internal Billing Options Plan Setup	
Plan	0	Plan	1
Enable	<input checked="" type="checkbox"/>	Enable	<input checked="" type="checkbox"/>
Label	<input type="text" value="Private Plan"/>	Label	<input type="text" value="Public Plan"/>
Description of Service	<input type="text" value="256K downstream, 128K upstream"/>	Description of Service	<input type="text" value="512K downstream, 256K upstream"/>
Pricing		Pricing	
Rate Per Minute	<input type="text" value="0.00"/>	Rate Per Minute	<input type="text" value="0.00"/>
Rate Per Hour	<input type="text" value="0.00"/>	Rate Per Hour	<input type="text" value="0.00"/>
Rate Per Day	<input type="text" value="8.95"/>	Rate Per Day	<input type="text" value="9.95"/>
Rate Per Week	<input type="text" value="0.00"/>	Rate Per Week	<input type="text" value="0.00"/>
Rate Per Month	<input type="text" value="0.00"/>	Rate Per Month	<input type="text" value="0.00"/>
Time Unit		Time Unit	
Minute	<input type="radio"/>	Minute	<input type="radio"/>
Hour	<input type="radio"/>	Hour	<input type="radio"/>
Day	<input checked="" type="radio"/>	Day	<input checked="" type="radio"/>
Week	<input type="radio"/>	Week	<input type="radio"/>
Month	<input type="radio"/>	Month	<input type="radio"/>
Wired for Business	<input type="checkbox"/>	Wired for Business	<input type="checkbox"/>
Maximum Bandwidth		Maximum Bandwidth	
Up	<input type="text" value="128"/>	Up	<input type="text" value="256"/>
Down	<input type="text" value="256"/>	Down	<input type="text" value="512"/>
QoS Policy	<input type="text" value="select a policy"/>	QoS Policy	<input type="text" value="select a policy"/>
DHCP Pool		DHCP Pool	
Private	<input checked="" type="radio"/>	Private	<input type="radio"/>
Public	<input type="radio"/>	Public	<input checked="" type="radio"/>
<small>NOTE: Public option requires IP Upsell to be turned on. Otherwise, subscribers will receive private IP addresses.</small>		<small>NOTE: Public option requires IP Upsell to be turned on. Otherwise, subscribers will receive private IP addresses.</small>	
<input type="button" value="Submit this Plan"/>	<input type="button" value="Delete this Plan"/>	<input type="button" value="Reset"/>	
<input type="button" value="Submit this Plan"/>	<input type="button" value="Delete this Plan"/>	<input type="button" value="Reset"/>	
<input type="button" value="Back"/>		<input type="button" value="Back"/>	



Radius – add the Nomadix-IP-Upsell to your dictionary and Nomadix-IP-Upsell = 1 attribute to the subscriber’s profile. 1= Public IP. If you do not set this attribute in the user profile, then private will be assumed.

Information and Control Console (ICC) – With the ICC enabled and a Public and Private billing plan enabled, a user who originally purchased a private plan can upgrade their plan to a public one.





XML - By adding the IP_Type attribute to the User_Add command, you can assign either a private or public address for the subscriber.

`</IP_Type>PUBLIC</IP_Type>` - allows the subscriber to receive a public DHCP lease.



DHCP Troubleshooting

How to troubleshoot DHCP conflicts?

I see many of these messages in my syslogs. What does it mean?

```
DHCP: icmp_check: BAD... conflict: Req: MAC 00-10-60-28-10-07; In SubTable: IP  
192.168.4.21 MAC 00-90-96-AC-46-43
```

This means that the device with the mac address of 00-10-60-28-10-07 is requesting a DHCP lease and the AG believes the lease, 192.168.4.21, can be reused, however once it checks the current subscribers table it finds a device with the mac address of 00-90-96-AC-46-43 is already in the table with this address. The AG will blacklist this IP address for five minutes and then try the next available lease so the device can receive a lease.

To clear this type of error, you will need to investigate why the device with the conflicting address is still in the current subscribers table. Go to Subscriber Administration/Current to view the table and find the mac address and click on it to view the profile.

If a profile appears, is it set as a device? If so, then this will always appear in the current table, even if the device is not connected to the network.

If the device information displayed states that it is in temporary memory, most likely the device is logged in using radius. View the same profile in the current table. Is there a value for Expiration and/or Idle Timeout? If neither are set, then unless the device logs out using the logout mechanism, the device will stay in the current table until manually deleted, or the device logs out. Since the device remains in the current table, its IP address cannot be reused causing the conflict.

How can I see if there is another DHCP server on the network?

The following syslog messages indicate the presence of another device acting as a DHCP server on the subscriber network.

```
DHCP: dhcpsStart: dst port (68) not DHCP server port
```

These two messages indicate the mac address of the device that is acting as a dhcp server

```
DHCP: dhcpsStart: MAC: 00-00-39-3A-19-DF has Server src port and dst port (68)
```

```
DHCP: dhcpsStart: MAC: 00-16-6F-01-0D-D8 has Server src port and dst port (67)
```



How do I know if a DHCP pool had run out of leases?

If you are using our Syslog feature, you may see one of the following messages indicating that a DHCP pool may be used up.

DHCP: Warning: DHCPDISCOVER - No available addresses in pool 192.168.0.0

DHCP: Warning: DHCPDISCOVER - No available addresses.

You may also view all of the DHCP leases handed out by the AG by navigating to Subscriber Administration/DHCP Leases. Here you will see all of assigned DHCP leases and their current status.

Releases before version 8.2

Currently Allocated DHCP Leases

Index	IP Address	MAC Address
1	10.3.3.4	00:A0:C9:BC:77:EE
2	10.3.3.5	00:50:DA:55:47:87

Version 8.2

Currently Allocated DHCP Leases

Index	IP Address	MAC Address	Lease Status	Time Remaining
1	10.0.1.12	70:5A:B6:A0:D5:31	Expired	

Counts: Active=0, Expired=1, Offered=0, Lapsed Offers=0, Conflicts=0



There are IP addresses in the Current table not in my DHCP pool

Devices with statically assigned IP addresses are serviced by the Nomadix and will appear in the Subscriber Administration/Current table. Also, you should check for another DHCP server on the LAN.