



## Changing the Internal Network IP Address Ranges

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This chapter describes public and private IP addresses (multinets) and how to configure the BBSM IP address ranges. Refer to these sections:

- [Public and Private IP Addresses \(Multinets\)](#), page 9-2
- [Configuring Internal Network IP Address Ranges in WEBconfig](#), page 9-3

Use this chapter to change the BBSM internal network IP address ranges:

- End-user clients (DHCP and Foreign addresses)
- Network equipment (Management addresses)
- Multinet temporary DHCP addresses

These are the IP addresses for the entire BBSM server; that is, only one IP configuration exists for each server.

Before using the IP Addresses web page, review the information below to ensure that you are using the correct BBSM tool to enter or change IP addresses.

- For the initial configuration, use the BBSM tools as follows to enter IP addresses:
  - If you purchased a BBSM appliance (rather than BBSM software on CD), use the Address Change Wizard to enter all BBSM IP addresses:
    - The TCP/IP properties (internal and external NIC IP addresses and subnet masks)
    - The BBSM internal network address ranges (DHCP, Management, Foreign, and Temp DHCP)
  - If you purchased BBSM software on CD (rather than a BBSM appliance), you should have configured the internal and external NIC IP addresses when you installed the Windows 2000 operating system. In this case, you can use either the Address Change Wizard or the IP Addresses in WEBconfig to enter the BBSM internal network address ranges.
- To change IP addresses after the initial configuration, use the BBSM tools as follows:
  - You can change all BBSM IP addresses using the Address Change Wizard. You must use the Address Change Wizard to change the TCP/IP internal and external NIC addresses and subnet masks. They cannot be changed on the IP Addresses web page in WEBconfig.
  - You can use the IP Addresses web page in WEBconfig to change the BBSM internal network address ranges (DHCP, Management, Foreign, and Temp DHCP).
  - If you are using multinets, you must use the Address Change Wizard if you want to delete multinet 2.

**Caution**

Do not use the Windows Network and Dial-up Connections window to change IP addresses. This window should only be used to set up multinets and dual VLANs.

## Public and Private IP Addresses (Multinets)

As of BBSM 5.2, you can offer end users a choice of individually assigned private or public DHCP IP addresses.

- **Public IP addresses**—These IP addresses can be accessed by other devices on the Internet. You benefit significantly in several ways by offering public IP addresses to your end users:
  - One key advantage to you is that you can charge a little more for public IP addresses than for private ones. You can offer these addresses to end users who need them and pass along some of your cost to the user. You can specify the prices for the public and private IP addresses on the Connect page, and the end user can decide which one meets his or her needs.
  - Another advantage to offering public IP addresses is that some VPN systems require their clients to have public IP addresses to operate correctly.
- **Private IP addresses**—These IP addresses cannot be accessed by other Internet devices. An advantage of using private IP addresses is that you do not have to take the steps to thwart security threats as you do when you use public IP addresses. Because the local network automatically maps each private IP address to a different public IP address for data going to and from the Internet, a private IP address cannot be seen on the Internet. Private IP addresses are also less expensive than public IP addresses.

A BBSM server can be configured as follows:

- *Multinet*—A BBSM server that is configured to support both private and public IP addresses is classified as *multinet* because the internal NIC is configured with two distinct logical subnets.
- *Singlenet*—A BBSM server that is configured as a single logical subnet and supports only one subnet of IP addresses is classified as a *singlenet*.

Table 9-1 shows the singlenets and multinets with subnets.

**Table 9-1 Relationship of Subnets to Singlenets and Multinets**

Network	Routed	Not Routed	Subnets
Singlenet		X	One bridged internal subnet
	X		One bridged internal subnet and one internal subnet per router
Multinet		X	Two bridged internal subnets
	X		Two bridged internal subnets and two internal subnets per router

For the initial configuration, BBSM can be configured in two ways for multinet based on whether BBSM is customer installed or factory installed:

- Customer-installed BBSM servers can be configured as multinets or singlenets when the Windows 2000 operating system is being installed. For additional information, refer to the *Cisco BBSM 5.3 Installation Guide*.

- Factory-installed BBSM servers are configured initially as a singlenets and must be reconfigured for multinet. To change your BBSM server to a multinet configuration, you must configure Windows for multinet. Refer to the [“Configuring Windows for Public and Private IP Addressing”](#) section on page 3-4.

For additional information about multinet use, refer to the following sections:

- To configure the public or private IP addresses, refer to the [“Running the Address Change Wizard”](#) section on page 5-1.
- To see which page sets support multinet provisioning by an administrator or self-provisioning by the end user, refer to the [“Page Set Overview”](#) section on page 18-2.

## Configuring Internal Network IP Address Ranges in WEBconfig

Follow this procedure to configure the IP address ranges for the internal BBSM network. If you are configuring your system for the first time, refer to the [“Running the Address Change Wizard”](#) section on page 5-1.

Note that these IP address configurations are possible:

- Singlenet or multinet with dual VLANs
- Singlenet or multinet without dual VLANs

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- Step 1** From the Dashboard, click **WEBconfig**. The BBSM Server Settings web page appears.
- Step 2** In the NavBar, click **IP Addresses**. The IP Addresses web page appears. Figures 9-1 and 9-2 show the web pages for a single network (singlenet) and for multinet.

Figure 9-1 IP Addresses Web Page (Singlenet, Single VLAN)

**Building Broadband Service Manager**  
WEBconfig

Dashboard | Help | Logout

**CISCO SYSTEMS**

**IP Addresses**

BBSM Server Settings  
**IP Addresses**  
 Sites  
 Routers  
 Network Elements  
 Port Test Settings  
 Billing  
 Security/SSL  
 Bandwidth Reservation  
 Custom Page Sets  
 Walled Garden  
 Port Hopping  
 WEB Printing  
 Alerts

**BBSM Internal Network Address Ranges**

DHCP Start	192.168.255.21
DHCP End	192.168.255.230
Management Start	192.168.255.2
Management End	192.168.255.20
Foreign (Static) Start	192.168.255.231
Foreign (Static) End	192.168.255.254

**BBSM TCP/IP Properties**

**Internal NIC**

IP Address	192.168.255.1
Subnet Mask	255.255.255.0

**External NIC**

IP Address	10.10.1.2
Subnet Mask	255.255.255.0
Default Gateway	10.10.1.1

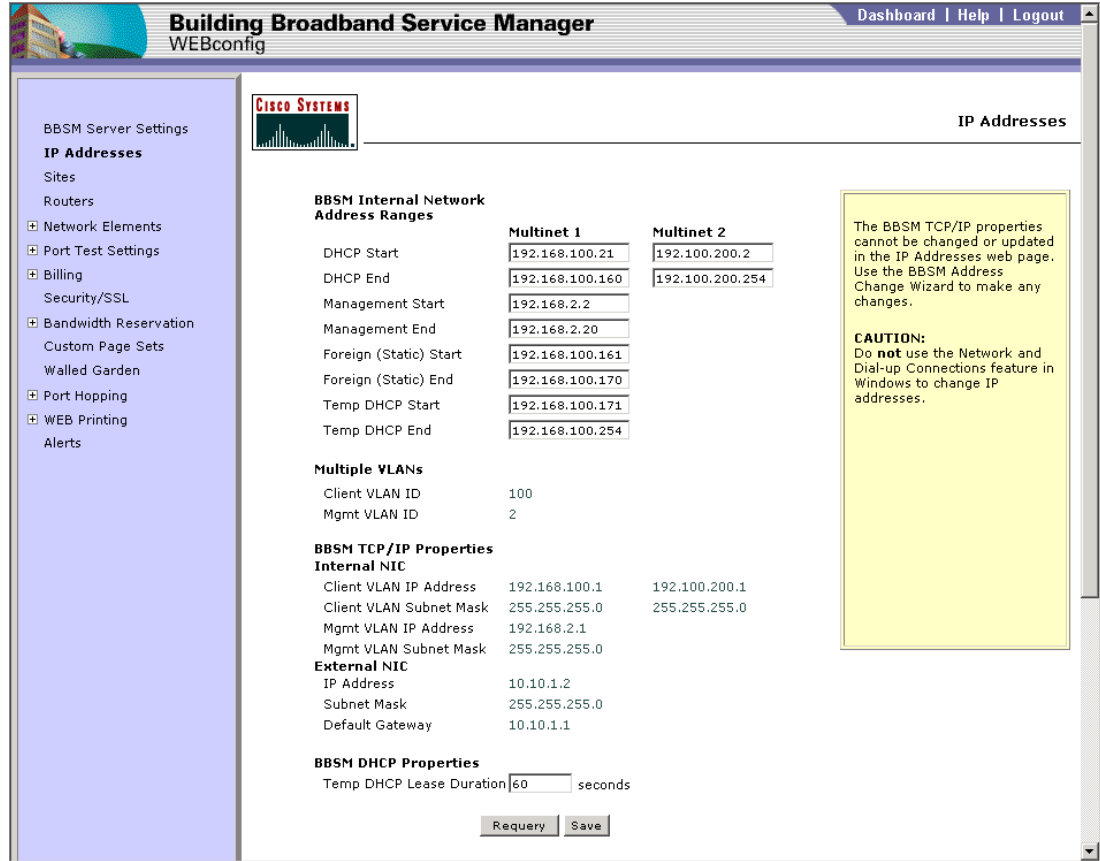
Requery Save

The BBSM TCP/IP properties cannot be changed or updated in the IP Addresses web page. Use the BBSM Address Change Wizard to make any changes.

**CAUTION:**  
Do **not** use the Network and Dial-up Connections feature in Windows to change IP addresses.

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Figure 9-2 IP Addresses Web Page (Multinet, Dual VLAN)



**Step 3** Enter the IP configuration data based on the information shown in Tables 9-2 and 9-3. Table 9-2 shows the IP address ranges that are used for singlenet and multinet configurations.

Table 9-2 IP Addresses Configuration

Parameter	Singlenet	Multinet 1	Multinet 2
DHCP and Management IP ranges	X	X	X
Foreign IP address ranges	X	X	—
Temp DHCP IP addresses	—	Multinet 1 or 2, whichever address range is higher	

**Step 4** Verify that the TCP/IP IP addresses are correct. They must be accurate for BBSM to function properly. If they are incorrect, refer to the “Running the Address Change Wizard” section on page 5-1 to change them.

Table 9-3 IP Addresses Web Page Options


Field	Description
<b>BBSM Internal Network Address Ranges</b>	
Management Start Management End	<p>Enter the starting and ending IP addresses for network equipment such as switches, base switches, access points, CMTSSs, and network-addressable UPS systems.</p> <p><b>Note</b> When Dual VLAN is configured on BBSM server, the management range should be on the management VLAN.</p> <p>If you are using multinets, note the following:</p> <ul style="list-style-type: none"> <li>• Multinet 1—Usually the private multinet.</li> <li>• Multinet 2—Usually the public multinet used for remote management. It is also used to assign static addresses to clients that need this configuration, such as for a meeting room in which the client needs routable addresses for its own servers.</li> </ul> <p> <b>Caution</b> All IP addresses in the management range are granted unchallenged access to the Internet. For security reasons, Cisco recommends that you use an address range only large enough for your network devices.</p>
DHCP Start DHCP End	Enter the starting and ending IP addresses to be assigned to end-user DHCP clients.
Foreign (Static) Start Foreign (Static) End	<p>Enter the starting and ending Foreign IP addresses for end-user clients that are configured with static IP addresses. This address range enables BBSM to perform adaptive network address translation (NAT) for statically configured devices in a bridged environment.</p> <p><b>Note</b> All other NAT and PAT functionality is handled by the external router.</p>
Temp DHCP Start Temp DHCP End ( <i>multinets only</i> )	<p>Enter the starting and ending IP addresses for the DHCP leases received by clients when they initially connect to the network. The minimum number of addresses in the range must be at least 20 percent of the total permanent DHCP IP addresses in multinets 1 and 2. Cisco recommends 20 to 30 percent.</p> <p><b>Note</b> This range must belong to the numerically higher multinet on the internal network.</p>
<b>Multiple VLANs</b> ( <i>dual VLANs only</i> )	
Client VLAN ID	Displays the client VLAN ID.
Mgmt VLAN ID	Displays the management VLAN ID.

Table 9-3 IP Addresses Web Page Options (continued)

Field	Description
<b>BBSM TCP/IP Properties</b>	
<i>(These fields are read only on this web page. To change these IP addresses, you must use the Address Change Wizard.)</i>	
<b>Internal NIC</b>	
IP Address Subnet Mask <i>(single VLAN)</i>	<p>Displays the IP address and subnet mask of the internal NIC that connects to the internal BBSM network. If you are using multinets, this field displays the IP address and subnet mask for multinets 1 and 2.</p> <p>Cisco recommends that you set the number of IP addresses (rooms or clients) only to the needed size and no larger. Because BBSM initializes each address at startup, configuring a larger range of IP addresses than necessary can greatly increase the initialization time and degrade performance. The following list shows the number of IP addresses available for the subnet sizes that you will probably use:</p> <ul style="list-style-type: none"> <li>• 255.255.255.0 subnet mask = /24 subnet code = 254 users</li> <li>• 255.255.254.0 subnet mask = /23 subnet code = 510 users</li> <li>• 255.255.252.0 subnet mask = /22 subnet code = 1022 users</li> </ul>
Client VLAN IP Address Client VLAN Subnet Mask Mgmt VLAN IP Address Mgmt VLAN Subnet Mask <i>(dual VLANs only)</i>	<p><b>Note</b> When dual VLANs are being used, these fields are displayed instead of the internal NIC IP Address and Subnet Mask fields above.</p> <p>Displays the client VLAN and management IP addresses and subnet masks. If you are using multinets, the Clients VLAN fields show the IP addresses and subnet masks for multinets 1 and 2.</p> <p>These fields can also be changed by using the Address Change Wizard.</p>
<b>External NIC</b>	
IP Address Subnet Mask	Displays the IP address and subnet mask of the external NIC that connects to the external router.
Default Gateway	Displays the default gateway to the Internet.
<b>BBSM DHCP Properties</b>	
Temp DHCP Lease Duration (in seconds) <i>(multinets only)</i>	<p>Enter the lease time for the temporary DHCP lease that a client receives when it connects to the BBSM network. Set this time low so that when the client chooses its IP preference, it receives its final IP address in a short amount of time. The longer it takes for the client to receive its final IP address, the more likely it is that the Temp DHCP range will fill up, which will prevent additional clients from connecting. The default is 60 seconds.</p> <p><b>Note</b> Some cable modems are unable to receive an IP address if the lease time is less than 180 seconds. When cable modems are being used, the Temp DHCP Lease Duration may need to be adjusted for them to come online. After all of the modems have come online and the port settings are configured for each port, you can re-adjust the Temp DHCP Lease Duration to a lower value again.</p>
<b>Buttons</b>	
Requery	Refreshes the web page (click before saving any changes).
Save	Saves the changes made to the web page.

