

Monitor the Es/No ratio (Es/No reports the energy per symbol-to-noise spectral density ratio (in dB)). Low Es/No or varying Es/No can indicate path or interference problems. The Es/No requirement varies based on the modulation mode:

20 Mbps: Es/No > 4 + IPC value

30 Mbps: Es/No > 5 + IPC value

40 Mbps: Es/No > 9 + IPC value

60 Mbps: Es/No > 12 + IPC value

In addition, the BSU log provides the following information:

**Int**

Relative interference of the power received at the BSU (a value of 0 (zero) nominally shows no interference)

**GPS sync**

-1 indicates GPS sync is disabled; 4 indicates GPS sync is enabled. GPS synchronization is used when the system is in Multi Sector mode (multiple BSUs installed in the same location; see "Configuring the System for Multi-Sector Mode" on page 29 for more information).

**SU ID**

The Terminal ID of the monitored SU

**Time error**

Shows the uplink (or inbound) ranging error

**Rx cell error**

Shows the number of lost uplink cells

**Rx cells**

Shows the total number of uplink cells

**Time**

Shows the cumulative polling time (in seconds)

## Displaying the SU Logs

You can display two different types of SU logs: SUlog1 and SUlog2. To display the SU logs, install the Base Station Configuration Software on the PC used to configure the SU (see "Installing the Base Station Configuration Software" for information) and then execute the commands described below.

Follow these steps to enable an SU log:

1. Enter **SUlog1 <time>** or **SUlog2 <time>** where <time> specifies the polling period (in seconds). (Specify **SUlog1** to display SUlog1; specify **SUlog2** to display SUlog2. See the information below for details about these two logs.)

- When finished, disable the SU log by entering **SUlog1 0** (zero) or **SUlog2 0** (zero) (depending upon which log you displayed).

SUlog1 provides the following information:

**SU ID**

The Terminal ID of the monitored SU.

**RSL**

Shows the shows the RSL (receiver signal level) at the output of the antenna (in dBm).

**TX Power**

Shows the SU's TX power at the input to the antenna (in dBm).

**VCO**

Shows the relative frequency offset of the VCO (voltage control oscillator) (in Hz).

**Time error**

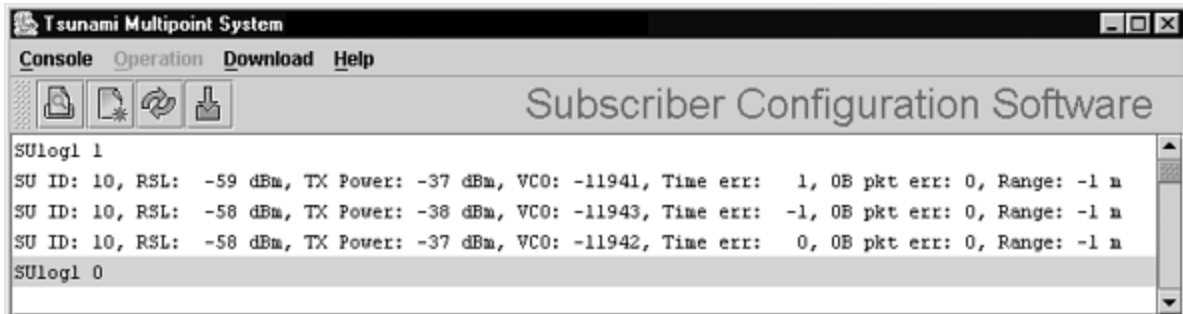
Shows the synchronization error (in 1/512 symbol), generally magnitude (should be less than 8).

**OB pkt error**

Shows the number of out-of-sequence outbound packets.

**Range**

Shows the SU's distance from the BSU (in meters).



**Figure 25. Log 1**

SUlog2 provides the following information:

**SU ID**

The Terminal ID of the monitored SU.

**Missed VARSYS**

Shows the number of missing downlink control packets.

**aloha retx**

Shows the number of packets retransmitted due to collisions (collisions are a normal event on contingent channels. An excessive number may indicate a problem).

### **IB pkts**

Shows the number of inbound packets transmitted.

### **OB pkts**

Shows the number of outbound packets received.

### **OB PE**

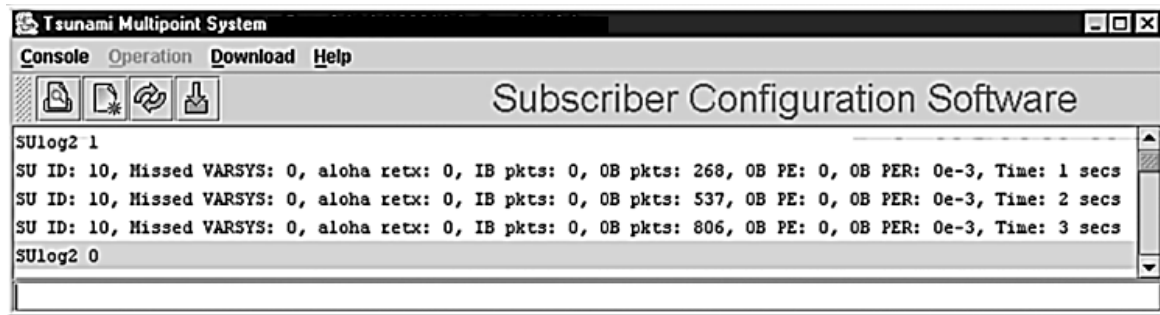
Shows the number of outbound packet errors.

### **OB PER**

Shows the error rate for outbound packets received.

### **Time**

Shows the cumulative polling time (in seconds).



**Figure 26. SU Log 2**

## **Uplink BER Test**

The Uplink BER Test determines the BER (bit error rate) of the uplink signal. This is an out-of-service diagnostic tool and the data connection is terminated for the length of the test. Use this tool to determine whether the link is stable (that is, there are no bit errors). You can also monitor these test results to fine tune antenna alignment to get the strongest link possible.

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**Note:** Do not run this test if users are sending data across the radio link.

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Follow these steps to run the Uplink BER Test:

1. Open the Base Station Configuration Software.
2. Enter **uplber <Terminal ID>** to start the test for a particular SU. <Terminal ID> is the Terminal ID of the SU of interest.
3. Enter **berlog 1** to view the test results.

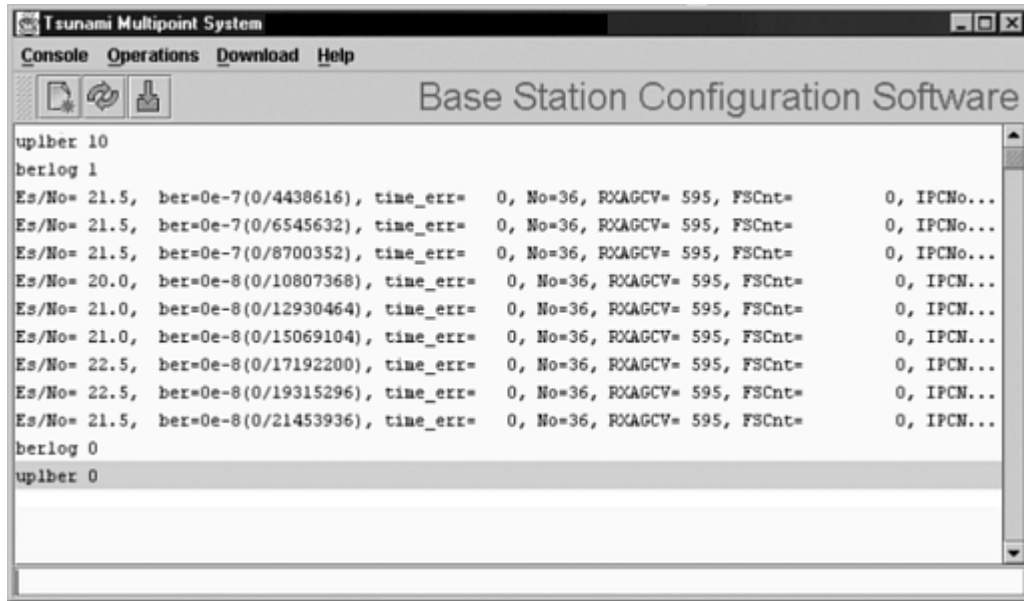


Figure 27. BER Log in Base Station Configuration Software

4. Monitor the BER test results. The Es/No is reported in column 1 and BER is reported in column 2. The BER should initially read **0E-6** or **0E-7** but then change to **0E-8** and finally to **0E-9** while the test is running. This corresponds to 0 (zero) bit errors. The numbers in parentheses indicates the number of errors over the total. **1E-6** indicates a bit error rate of 1 bit error received for every million bits sent.
5. When finished, disable the Uplink BER Test by first entering **berlog 0** (zero) and then entering **uplber 0** (zero).

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**Note:** The data connection does not resume until the **uplber 0** (zero) command has been issued.

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## Network Configuration Tips

Keep the following points in mind when configuring your PMP network.

### Tips for Testing PMP Network Under IP Routing Mode

Make sure to configure the BSU such that:

- If the BSU is connected to a router, make sure the router port to which the BSU is connected is defined as the BSU's default gateway. Also, make sure the BSU is specified as the router port's default gateway.
- The IP addresses of the BSU and the router port reside in the same subnet (this is required).

Make sure that an SU and its directly connected devices are in the same subnet. The subnet address of a device can be obtained by performing a logical “AND” of the device’s IP address with its subnet mask. A subnet mask of 255.255.255.0 implies that there are 255 IP addresses within the same subnet.

If the IP address of a PC connected to a SU is not dynamically assigned:

- Make sure the PC’s IP address appears in the SU’s static IP list (see “addSUIP Command” in the *Tsunami Multipoint Version 1.3 Reference Manual*). Otherwise, if the SU is running in Restricted mode, the PC cannot access the wireless network.
- Configure the PC to point to the SU as its default gateway.

In the latest firmware release, the proxy setting is turned on automatically; do not change this setting.

## **Tips for Testing VLAN Switching**

Before changing the BSU Configuration to VLAN switching, make sure that the BSU and the BSU console are connected to a VLAN switch. Otherwise, if you turn on VLAN tagging, you cannot talk to the BSU because the PC hosting the BSU Console cannot send or receive VLAN frames.

## **Tips for Anyone Operating the PMP Network**

When changing back and forth between Bridging mode and IP Routing mode (see “routingMode Command” in the *Tsunami Multipoint Version 1.3 Reference Manual*), always remember to manually clear the ARP table of your PC.

Do not turn off the power of the Base Station Unit “at-will,” because the Base Station Unit might be saving internal variables or configuration parameters to the flash memory at that moment. Always wait for a minute after entering an operator command before shutting down the BSU.

Always follow the simple proxy rule and fundamental principles concerning subnets and default gateways in planning and analyzing the PMP network. A good understanding of basic IP networking is required, regardless of whether you operate the PMP network in IP Routing or Bridging mode.

If you cannot get the network to work, there is most likely a setup error. Check the network configuration using the tips above and try again.

## **Protecting the System**

Tsunami Multipoint provides ways to prevent unauthorized users from communicating with the BSU and SUs. You can password-protect the system to prevent unauthorized access and use the Range Security option to prevent unauthorized SUs from communicating with a BSU.

## Password Protection

Tsunami Multipoint provides two levels of password protection:

- **user level** – lets the user display the system’s current status only.
- **admin level** – lets the user display the system’s status and change its configuration.

The default password is “null.” Password protection for either password level (user or admin) can be turned on and off. By default, password protection is turned off.

Passwords can be from 1 to 16 characters; any combination of alphanumeric characters is allowed, except for these special characters: " , . ' ` ^ { } | \ / ; : ] [ ( )

If you forget your password, contact Proxim’s Customer Service department to obtain a new one. See “Appendix F. Technical Support and Training” on page 76 for Proxim’s contact information.

### *Specifying a User-Level Password*

To define the user-level password, from the BSU console enter:

**setpw user<oldpw><newpw><newpw>**

where:

<oldpw> = the old password (the default password is “null”)

<newpw> = the new password

After defining the new user-level password, enter **logout**. Log in with the new password (see Logging In on page 47 for information).

### *Specifying an Admin-Level Password*

To define the admin-level password, from the BSU console, enter:

**setpw admin<oldpw><newpw><newpw>**

where:

<oldpw> = the old password (the default password is “null”)

<newpw> = the new password

After defining the new admin-level password, enter **logout**. Log in with the new password.

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**Note:** If you specify either level of password without specifying a password for the other level, when you log out or restart the BSU, the system comes up in password-protected mode. Log in and enter the password you specified. For example, if you specify “admin” for the admin-level password and then log out or restart the BSU, enter **login admin** to access the system. This allows access to the admin-level.

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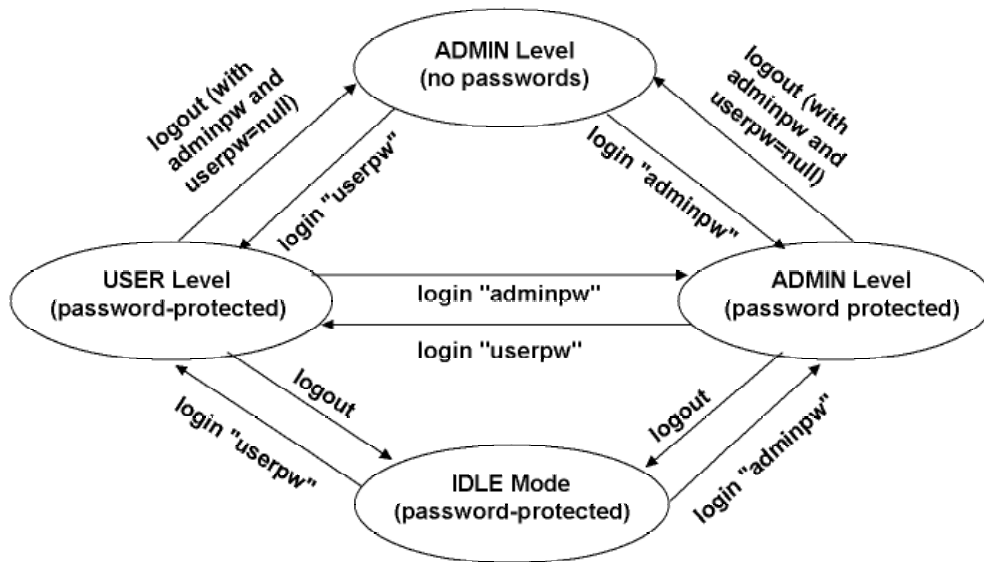
## **Turning Off Password Protection**

To turn off password protection, from the BSU console, enter **setpw<level><oldpw><null><null>** where:

<level> = either **admin** or **user**, depending upon which level of password protection you want to remove. For example, if the current admin password is "superuser," to remove the admin password, enter **setpw admin superuser null null**.

<oldpw> = the old password.

If you turn off both display-level and user-level password protection, restart the BSU to refresh its memory.



**Figure 28. Password Definition/Usage Diagram**

## **Logging In**

If password protection is turned on, you must "log in" to the system to either display system status (user-level privileges) or change the system's configuration (admin-level privileges).

To log in, enter **login <password>** where <password> is either the user-level or admin-level password.

## **Activating Range Security**

The Range Security option helps prevent unauthorized SUs from communicating with a BSU. When the Range Security option is on, if an SU attempts to enter the network, the BSU checks the range value reported by the SU. This works as follows:

- The first time the SU tries to enter the network, the SU's range is stored in the BSU's flash memory for future reference.
- Then, if the SU enters the network again (when Range Security is on) and its reported range does not match the range that was previously stored in the BSU's flash memory, the SU is denied network entry and an alarm is sent to the BSU console.

To activate the Range Security option, from the BSU console, enter **rangeSecurity 1**.



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## Appendix A. Initial Settings

### Specify the Desired Modulation (Data Rate)

To configure the BSU to use the modulation setting required by your application (20, 30, 40, or 60 Mbps), from the BSU console, enter **modulation <mode number>**, where:

<mode number> =

0 (zero) = QAM16 (60 Mbps)

1 = QAM8 (40 Mbps)

2 = QPSK3Q (30 Mbps)

3 = QPSK1H (20 Mbps)

The BSU automatically restarts and then comes up with the new modulation setting. The Subscriber Units adopt the new modulation setting (the new modulation setting appears in the **Burst Rate** field on the **Status** page of the Subscriber Utility).

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**Note:** This step is not applicable if the BSU operates at 20 Mbps only.

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### Specify the BSU's Gateway Address

In general, you should specify the IP address of the router connected to the BSU as its gateway address. If your network does not have a router installed, specify the IP address of the BSU console. To specify the BSU's gateway address, from the BSU console, enter **gateway <gateway address>** where <gateway address> is the IP address of the router attached to the BSU or the BSU console.

### Select the Routing Mode

Set the BSU to operate in IP Routing mode or Bridging mode. A BSU is set to IP Routing mode by default. See the "routingMode" command in the *Tsunami Multipoint Version 1.3 Reference Manual* for more information about these modes. After you change the routing mode, the BSU restarts and forces all the SUs in its sector to restart. The BSU and SUs then come up with the new routing mode.

To select Bridging as the routing mode, from the BSU console, enter **routingMode 1**.

To select IP Routing as the routing mode, enter **routingMode 0** (zero).

## Change the Frequency Plan and Operating Frequency

Tsunami Multipoint offers several frequency plans and operating frequencies to provide a means for overcoming interference. If one part of the 5.8 GHz spectrum is occupied when you deploy the product, you can select a different frequency plan to bypass the interfering frequency.

To select a frequency plan and operating frequency, specify a frequency plan (4, 5, or 6), then one of the available frequencies (one of four frequencies for plan 4, one of five frequencies for plan 5, one of six frequencies for plan 6). Plan 4 is the default frequency plan. Operating frequencies in the 5 and 6 plans overlap. See "Frequency Plans" on page 57 for details about the available frequency plans and operating frequencies.

To select a frequency plan, from the BSU console, enter **freqPlan<frequency plan>** where <frequency plan> is 4, 5, or 6.

To select an operating frequency, from the BSU console, enter **frequency<frequency ID>** where <frequency ID> is:

For plan 4: A, B, C, or D

For plan 5: A, B, C, D, or E

For plan 6: A, B, C, D, E, or F

For example, to change to the **5e** plan, enter **freqPlan 5**; then enter **frequency e**.

## Appendix B. Installing the Configuration Software and Upgrading Firmware

Four major pieces of software are required to install the SU and BSU:

- Tsunami Multipoint Base Station Configuration Software Console, Version 1.5 (BSU 1.5 Console)
- Tsunami Subscriber Utility
- BSU Firmware Version 1.3
- SU Firmware Version 1.3

If the BSU and SU are new from the factory they will be preloaded with BSU Firmware Version 1.3 and SU Firmware Version 1.3, respectively. Proxim recommends that all equipment be upgraded to Firmware Version 1.3, following these steps:

1. Install the new BSU 1.5 Console (**Console1.5/BSU/Install.exe**). This step is optional, but recommended.
2. Install BSU Firmware Version 1.3 (**PMP\_SU\_release1-3.mot**)
3. Install SU Firmware Version 1.3 (**PMP\_BSU\_release1-3.mot**)

Methods for upgrading SU equipment from Versions 1.0, 1.1, 1.1A, 1.1B, 1.2, or 1.2B to Version 1.3 follow, including remote over-the-air download and local download instructions.

### Base Station Configuration Software Version 1.5

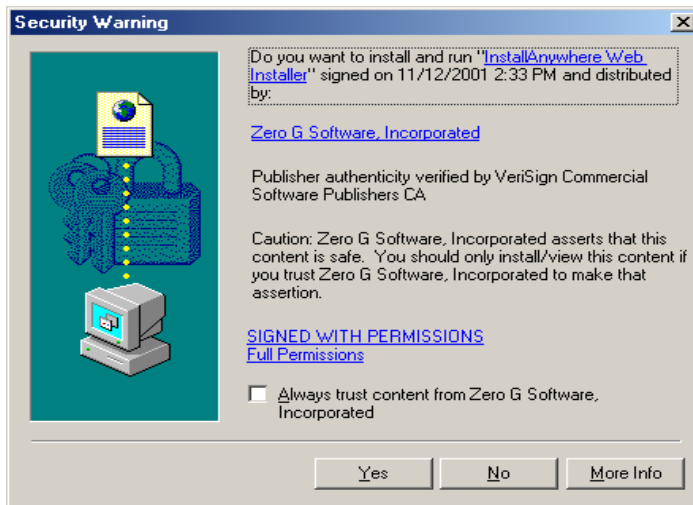
#### System Requirements

Hardware	Multimedia PC with a Pentium 200 MHz or higher processor (300 MHz recommended)
Operating System	Microsoft Windows® 98, NT 4.0, Me, 2000, XP
Java 2 Virtual Machine (JVM)	SDK or runtime (1.2.2_12 or later, 1.3.1_03 is provided)
Memory	64 MB for Windows® 95/98 or Windows® Me; 128 MB for Windows® NT 4.0 workstation, Windows® 2000 Professional, or Windows® XP Professional (256 MB RAM is recommended)
Hard Drive	2 GB hard disk with up to 250 MB of available hard-disk space
ROM Drive	Double speed (2x) or faster CD-ROM/DVD-ROM
Network Interface Card	10/100 Mbps NIC with RJ-45 input
Input Devices	Standard IBM-PC compatible 101-key style keyboard, PS2 or USB compatible mouse, or a compatible pointing device
Monitor	Super VGA 16-bit or higher monitor supporting 800 x 600 screen resolution Coordinated video driver for installed video card VGA not supported
Graphics Card	PCI, AGP, or on-board graphics card supporting 16-bit 640 x 480 video resolution or higher. Must Support 16 bit color.
Video Driver	Must support 16 bit color
Browser	Microsoft Internet Explorer 5.0 software or later; other browsers also supported
Optional Hardware	16-bit sound card with speakers or headphones for audible alarm; 6 foot power strip with power surge protection
Optional Software	Microsoft Personal Web Server, Internet Information Server (IIS), or Apache 1.3.x can be served by VAR for over the Internet console installation

## Installing the Base Station Configuration Software Version 1.5 Console

To install the BSU/SU 1.5 Console:

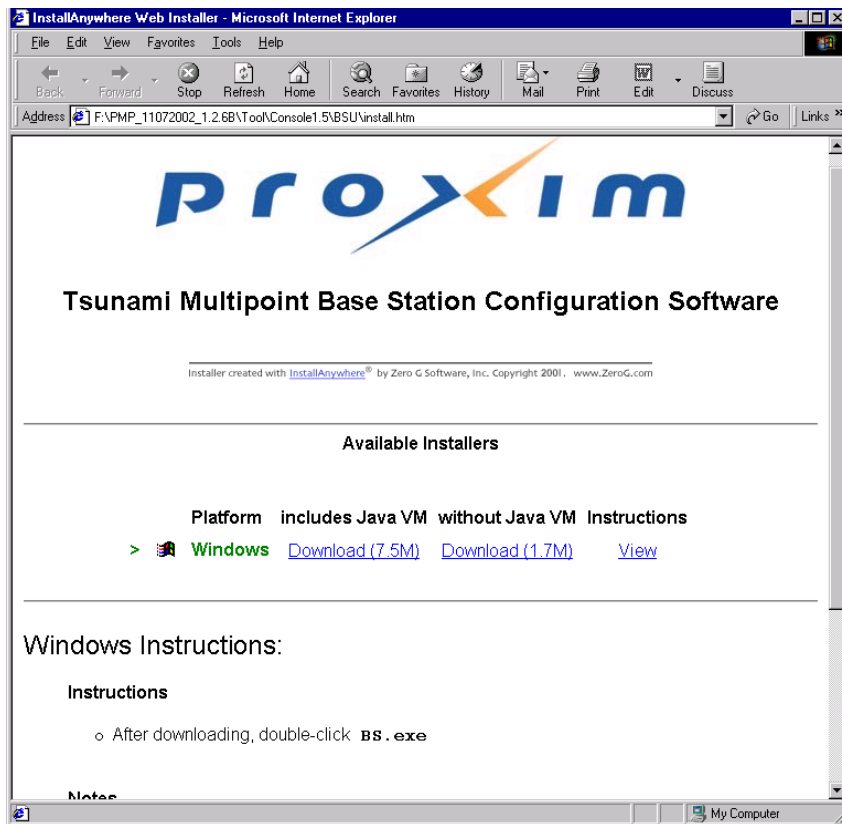
1. From the Windows Explorer Console1.5 directory, double-click on the BSU folder.
2. Double-click on the Install icon. Two windows open simultaneously: **InstallAnywhere Web Installer — Microsoft Internet Explorer** (in disabled mode) superimposed by **Security Warning** (in enabled mode).



Click the **Yes** button on the Security Warning window to close this window and view the Base Station Configuration Software window.

For the remainder of this procedure, only default settings are used. Select the applicable installer for your network environment when performing these steps.

3. Click **Download 7.5M** to download the Tsunami Multipoint Base Station configuration software and Java VM; click **Download 1.7M** to download the Tsunami Multipoint Base Station configuration software without Java VM.



After the download completes, double-click on **BS.exe** to begin installation.

When the Tsunami Multipoint Base Station Configuration Software **Introduction** window is displayed; click **Next**.

4. Click **Next** on the Important Information window once you have completed reading the text. When the License Agreement window is displayed, accept the terms of the License Agreement and click **Next** to proceed with the installation.
5. Click the **Next** button after making your choices on the following windows:
  - **Choose Install Folder** (you can select the default folder or specify another folder)
  - **Choose Java Virtual Machine** (you can select the default machine or specify another machine)
  - **Pre-Installation Summary** (summarizes the installation choices you have made)
6. When the **Install Complete** window is displayed, click on **Done** to return to the Web Installer window; then close the Web Installer window.

## Subscriber Utility Software

### System Requirements

Same as for Base Station Configuration Software (see “System Requirements” for the BSU on page 51).

### Installing the Subscriber Utility Software

System requirements for the Subscriber Utility software are the same as for the Base Station Configuration software.,

To install the utility software:

1. Identify the computer on which you plan to run the Subscriber Utility.

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**Note:** See “System Requirements” for the BSU on page 51 for operating system and hardware requirements.

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2. Insert the Tsunami MP CD (provided with the product) into the computer’s CD-ROM drive and open the CD’s **config software** folder.

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**Note:** If the computer has Microsoft IIS (Internet Information Services) running, disable or uninstall it before running the Subscriber Utility.

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3. Double-click SUSEUP.HTM or use a Web browser to open the file.
4. Place a checkmark next to the **Include VM in download** option to install Java Virtual Machine (VM).

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**Note:** You need not add VM if your computer already has a version of VM installed.

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5. Click the **Start Installer for Windows** button to begin the software installation.
6. Follow the on-screen instructions to install the software.
7. Click **Done** when the installation is finished to close the installer.
8. Launch the Subscriber Utility.

### Firmware Downloads

Firmware can be downloaded to the BSU using the local console. Firmware can be downloaded to the SU either over-the-air or from a local console (by attaching a PC with the Base Station Configuration Software to the SU).

Proxim recommends you download new code as follows:

1. Download the new code to the SU’s and verify that they re-enter the network.
2. Next, download new code to the BSU.

## Remote Over-the-Air Download to SUs

You can upgrade your SUs to Version 1.3 from the Base Station Configuration Software Console of the BSU. Normally, all SUs in the network are upgraded at the same time. However, if one or more SUs fail to receive the download code correctly, the upgrade is aborted and a second attempt must be made. SUs that have been upgraded successfully ignore reprogramming of the same codes.

To download remotely to SUs:

1. From the BSU 1.4 or 1.5 Console, confirm that SUs have established a link with the BSU by issuing a **dspActiveSU** command. Make note of the SUs in the network.
2. Select the **Download** menu.
3. Select **Remote Firmware**; a **Download — File Selection** window is displayed.
4. From the **Look In** search field, select the binary file to be downloaded (**PMP\_SU\_release1-3.mot**) from the appropriate directory. The BSU Console automatically processes the selected binary codes and, once finished, displays an output of “Elapsed [time]” in seconds.
5. Let the SUs re-enter the network. It usually takes no more than five minutes for the SUs to enter the network from the start of the download. The following messages are displayed at the BSU Console for each SU as it enters the network:
  - 118 Received NetEntry Request from Eth<SUs Ethernet address>
  - 119 NetEntry completed: Assigned terminal ID <ID#>, IP<SUs IP address>, and VLAN ID <SU VLAN ID#> in VLAN mode.
6. Issue **dspActiveSU** to verify that the SUs have entered the network successfully. If an SU fails to enter the network, use the local download procedure in the following section.
  - If the SU was correctly upgraded, the display reads **ver 20021300**.
  - If the SU failed to upgrade and the link was restored, the display most likely reads **ver 200212B0**.
7. If any SU that re-entered the network failed to upgrade to Version 1.3, repeat steps 2 through 6, or upgrade the failing SUs using the “Local Download to SUs” method.

## Local Download to SUs

You can use this method to upgrade SUs that have not been deployed or have failed to successfully download using the remote over-the-air procedure. Using this procedure, individual SUs are upgraded through their Ethernet/Power cable. This procedure requires the Tsunami Multipoint Base Station Configuration Software application be loaded on the PC attached to the SU (SU 1.,4 or 1.5 Console). The window label appears as Tsunami Multipoint Subscriber Configuration Software.