Summit WM Getting Started Guide

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Contents

1 About this guide

The purpose of the Getting Started Guide is to assist you in deploying Summit WM-Series WLAN Solution by mapping preparation, installation, and configuration tasks into a logical and efficient flow.

You can use this guide independently of other documents. However, if you are looking for detailed information on any aspect of the system's installation, configuration, or management, use this guide in conjunction with the *Summit WM-Series WLAN Switch Software User Guide*.

This guide is based on the following product families:

- Summit Switch WM2000
- Summit Switch WM200
- Summit SwitchWM1000
- Summit Switch WM100

1.1 Who should use this guide

The guide is written for Extreme Networks' clients.

You must be familiar with computer networking concepts to use this guide.

1.2 What is in this guide

This contents in this guide are organized under the following chapters:

- Chapter 1, "About this guide"– Describes the purpose, the target audience and the architecture of this guide.
- Chapter 2, "Summit WM-Series WLAN Switch Software Solution" – Captures the essential concepts of the solution.
- Chapter 3, "Summit WM-Series WLAN Switch configuration"– Explains how to configure the Summit WM Switch's settings in order to make it operational.
- Chapter 4, "Physical ports configuration"– Describes how to configure the Summit WM Switch's physical ports.
- Chapter 5, "Routing configuration"– Explains how to configure the static and OSPF routings on the Summit WM Switch's physical ports.
- Chapter 6, "Configuring DHCP, DNS and IAS services"– Describes how to configure DHCP, DNS and IAS services on Windows 2003 Server. In addition, the chapter explains how to configure DHCP service on a Linux-based server.

- Chapter 7, “Altitude AP’s configuration”– Explains how to configure and manage the Altitude APs through the Summit WM Switch.
- Chapter 8, “WM-AD configuration”– Describes how to create and configure WM-AD via the Summit WM Switch.
- Chapter 9, “Availability and Mobility configuration” – Explains how to configure availability and mobility features via the Summit WM Switch.

1.3 Formatting conventions

The document uses the following formatting conventions to make it easier to find information and follow procedures:

- Bold text is used to identify components of the management interface, such as menu items and section of pages, as well as the names of buttons and text boxes.
  - For example: Click **Logout**.
- Monospace font is used in code examples and to indicate text that you type.
  - For example: Type `https://<SWM-address>[:mgmt-port>]`
- The following symbols are used to draw your attention to additional information:

Note: Notes identify useful information, including reminders, tips, or other ways to perform a task.

Note: Cautionary notes identify essential information, which if ignored can adversely affect the operation of your equipment or software.

Note: Warning notes identify essential information, which if ignored can lead to personal injury.

1.4 Document feedback

If you have any problems using this document, please contact the next level of support:

- Customers should contact the Extreme Networks Technical Assistance Center (TAC).

When you call, please have the following information ready. This will help us to identify the document that you are referring to.

- Title: Summit WM-Series WLAN Switch Software Getting Started Guide
- Part Number: 120385-00 Rev 01

2 Summit WM-Series WLAN Switch Software Solution

This chapter describes the essential concepts of Summit WM-Series WLAN Switch Software Solution.

The topics in this chapter are organized as follows:

2.1 Conceptual model

The Summit WM-Series WLAN Switch Software Solution is an enterprise WLAN solution that consists of the following components:

- Summit WM-Series WLAN Switch (Summit WM Switch)
- Altitude AP
- Summit WM-Series WLAN Switch Software

2.1.1 Summit WM Switch

The Summit WM Switch is a high-performance server that provides several functions, including centralized management and configuration of Altitude APs, user authentication, and advanced radio frequency management.

The Summit WM Switch is driven by Summit WM-Series WLAN Switch Software. The software resides on the Summit WM Switch and provides an intuitive web-based interface — Extreme Networks Summit WM-Series Console to enable you to manage the entire wireless network from a wired laptop, or a PC connected to the network. A command line interface is also available to manage the wireless network.

The Summit WM Switch is a full-functioning dynamic router that aggregates and coordinates all Altitude APs and manages client devices.

Some key features of the Summit WM Switch provided in the following sections:

2.1.1.1 Web-based centralized management of Altitude APs

The Summit WM Switch enables you to monitor and manage Altitude APs from a centralized web-based interface called the Extreme Networks Summit WM-Series Console. You can separately configure, enable, or disable each Altitude AP from the Summit WM Switch using the Extreme Networks Summit WM-Series Console.

The Extreme Networks Summit WM-Series Console also allows you to group the APs of similar attributes into one of ten upgrade profiles for the purpose of deploying software upgrades.You can initiate the software updates on a profile and the updates will be deployed to each AP in the profile. This saves you from the cumbersome task of deploying the updates to each AP individually.

2.1.1.2 Virtualized user segmentation

The Summit WM Switch allows you to create and manage unique WM Access Domain that enables you to group specific mobile users, devices and applications on the basis of policy class in order to provide unique levels of service, access permissions, encryption, and device authorization.

A WM-AD segment is a virtual network and each Altitude Access Points can support multiple WM-AD segments.

WM-AD optimizes the dynamic nature of WLAN mobility as WM-AD groups can follow users without depending on the physical configuration of the network.

The following is the list of Summit WM Switches and the number of WM-ADs they can support.

- Summit Switch WM2000: 64 WM-ADs
- Summit Switch WM200: 32 WM-ADs
- Summit Switch WM1000: 50 WM-ADs

2.1.1.3 Summit Switch WM100: 32 WM-ADsAuthentication and encryption

The Summit WM Switch and Altitude AP work together to support comprehensive authentication, encryption, and intrusion detection capabilities. A range of robust security features based upon the 802.11 and WPA2 standards ensure that your network stays protected.

802.1X mechanism in conjunction with RADIUS and pre-shared key authentication ensure that only authorized users can access the network.

Other features include Captive Portal for redirected web-based authentication.

2.1.1.4 Intrusion detection

The Summit WM Switch allows you to configure Altitude APs to detect rogue access points on the network by scanning the radio frequency (RF) space at specific intervals. Scan results are then forwarded to the Summit WM Switch; the Summit WM Switch processes and presents the data centrally. Rogue detection data can be viewed via the Extreme Networks Summit WM-Series Console.

2.1.1.5 Automatic assignment of IP addresses to the client devices

The Summit WM Switch has built-in DHCP server that assigns IP addresses to the client devices. The Summit WM Switch is also capable of working with an external DHCP server.

2.1.1.6 Web authentication

The Summit WM Switch has a built-in Captive Portal capability that allows Web authentication (Web redirection) to take place. The Summit WM Switch is also capable of working with external Captive Portal.

2.1.2 Altitude AP

Altitude APs are wireless LAN access points that bridge the network traffic between wireless devices and the Ethernet LAN.

2.1.3 Summit WM-Series WLAN Solution topology and network elements

The following figure illustrates a typical configuration with a single Summit WM Switch and two Altitude APs, each supporting a wireless device. A RADIUS server on the network provides user authentication, and a DHCP server assigns IP addresses to the Altitude APs. Network inter-connectivity is provided by the infrastructure routing and switching devices.

Summit WM-Series WLAN Topology

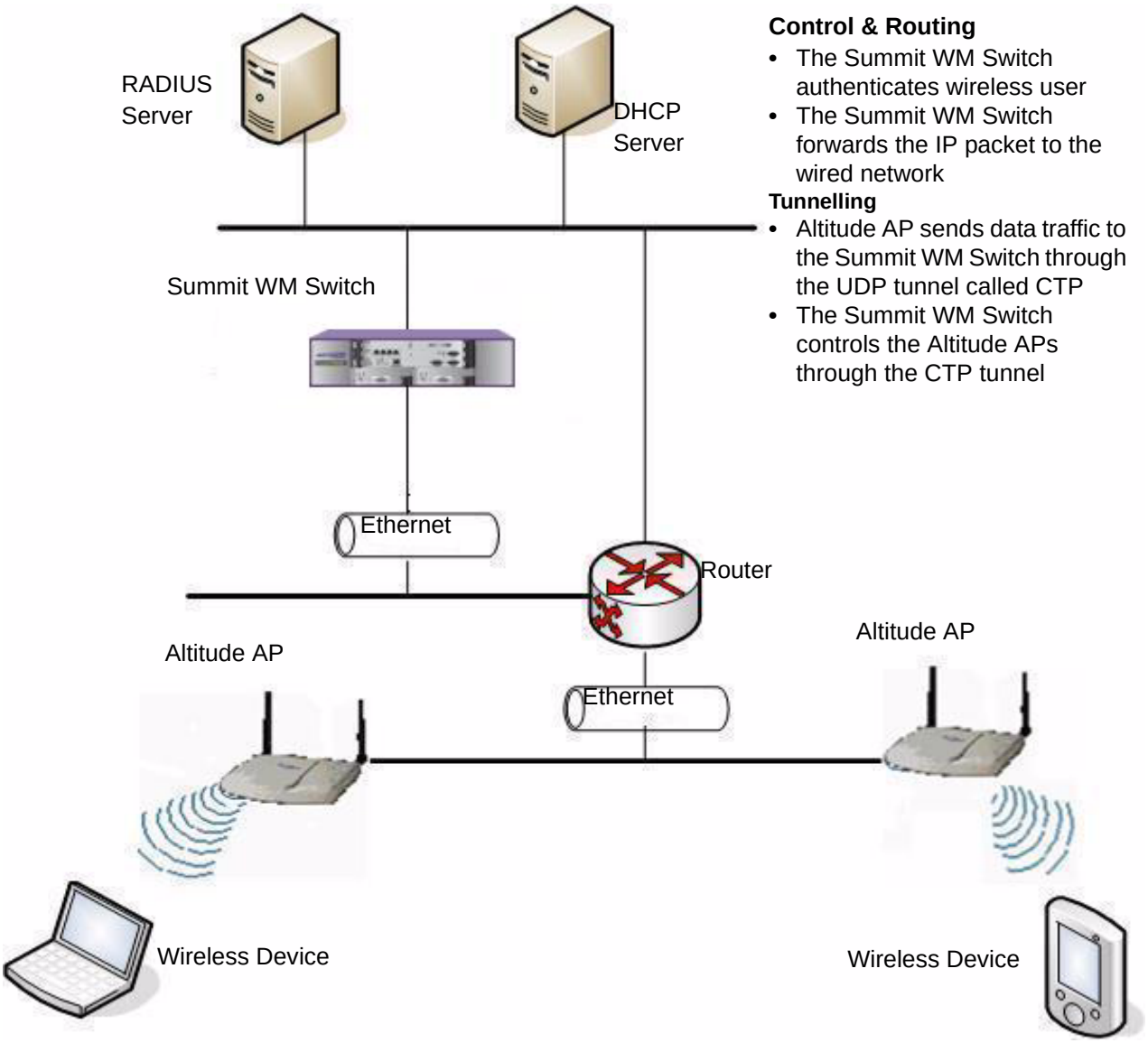


Figure 1 Summit WM-Series WLAN topology

The Summit WM Switch supports the following network elements.

- **RADIUS Server (Remote Access Dial-in User Service) –** An authentication server that assigns and manages ID and Password protection throughout the network. The RADIUS server system can be set-up for certain standard attributes such as filter ID, and for the vendor specific attributes (VSAs). The Summit WM Switch supports external RADIUS server.

- **DHCP Server (Dynamic Host Configuration Protocol) –** A server that assigns the IP addresses, gateways, and subnet masks dynamically. The external DHCP server depicted in Figure 2-1 is primarily utilized to provide addresses to infrastructure equipment such as APs. The IP addresses to the mobile devices are provided by the built-in DHCP server of Summit WM Switch. You can also configure the Summit WM Switch to relay DHCP requests to the external DHCP server.
- **SLP (Service Location Protocol) –** A service discovery protocol that allows computers and other devices to find services in a local area network without prior configuration. The client applications are user agents and services that are advertised by a service agent. In larger installations, a directory agent collects information from service agents and creates a central repository. SLP is one of the several modes that the Summit WM Switch uses to discover the Altitude APs.
- **Domain Name Server –** A server that translates the domain names into IP addresses. The DNS is used as an alternative mechanism for the automatic discovery process. The Summit WM Switch, its software, and the APs rely on the DNS for Layer 3 deployments. In addition, DNS is utilized for the static configuration of APs. The Summit WM Switch can be registered in DNS to provide DNS assisted AP discovery.

2.1.4 Discovery mechanism in Summit WM-Series WLAN Solution

The Summit WM-Series WLAN Solution provides auto-discovery capabilities between the following components:

- Altitude APs and Summit WM Switch
- Mobility manager and mobility agents (For more information, see Chapter 9, “Availability and Mobility configuration”.)

2.1.4.1 Discovery mechanism between Altitude AP and Summit WM Switch

The Altitude APs discover the Summit WM Switch by one of the following modes:

- SLP (Multicast and Unicast) – For more information, see SLP’s description in Section 2.1.4, “Discovery mechanism in Summit WM-Series WLAN Solution”, on page 15.
- DNS – For more information, see Domain Name Server’s description in Section 2.1.4, “Discovery mechanism in Summit WM-Series WLAN Solution”, on page 15.

- Static IP address configuration – Summit WM Switch's IP address is defined in Altitude AP configuration. For more information, see Section 7.5, "Configuring static IP address for Altitude APs", on page 86.

2.1.4.2 Discovery mechanism between mobility manager and mobility agents

The mobility agents discover the mobility manager by one of the following modes:

- SLP with DHCP Option 78 – The mobility agent on each Summit WM Switch discovers the address of the mobility manager using DHCP Option 78.
- Direct IP address option – Defined while configuring the mobility agent. By explicitly defining the manager's IP address while configuring the agents, enables the manager and agents to find each other directly without using the SLP discovery mechanism.

2.1.5 DHCP usage scenarios in Summit WM-Series WLAN Solution

DHCP usage has four scenarios in Summit WM-Series WLAN Solution:

- DHCP for Altitude APs
- DHCP for WM-AD
- DHCP relay for WM-AD
- DHCP for traffic bridged locally at Altitude AP

The following sections explain the four scenarios with the help of graphical illustrations.

2.1.5.1 DHCP for Altitude APs

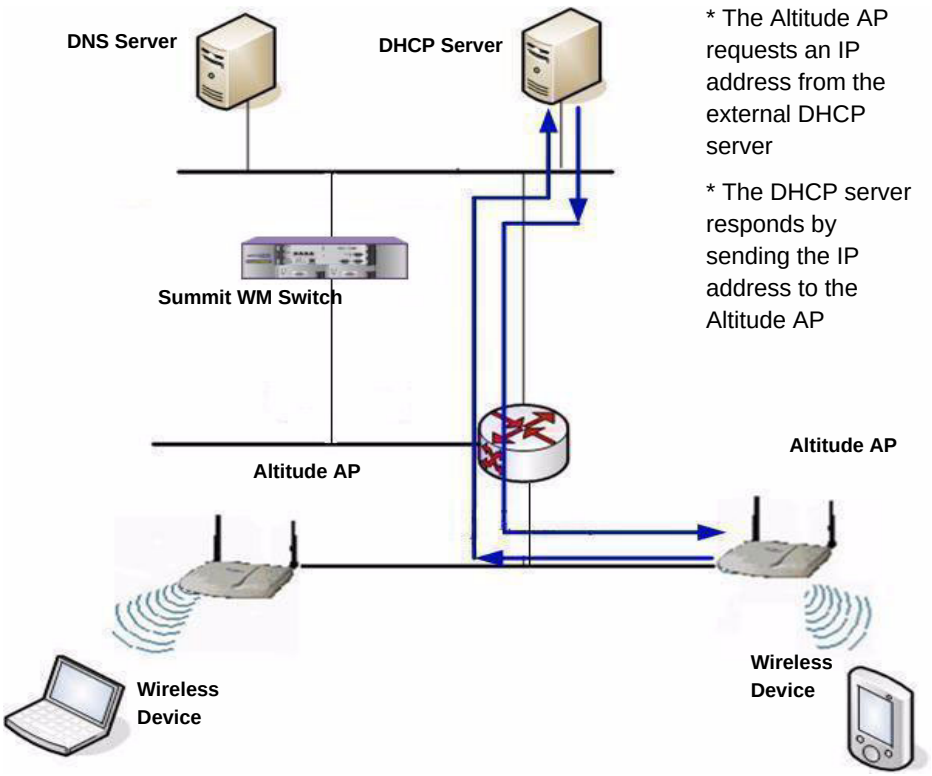


Figure 2 DHCP for Altitude APs

You can use Windows 2003 server, amongst others, for deploying DHCP service for Altitude APs. For more information, see Section 6.1, “DHCP service configuration”, on page 61.

2.1.5.2 DHCP for WM-AD

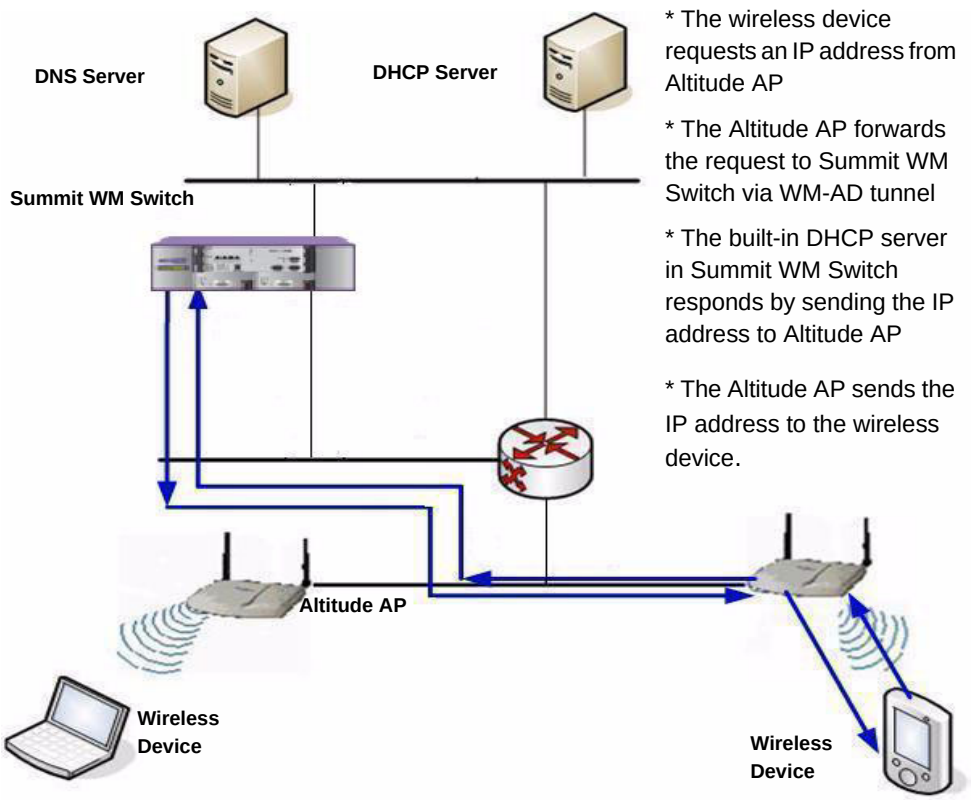
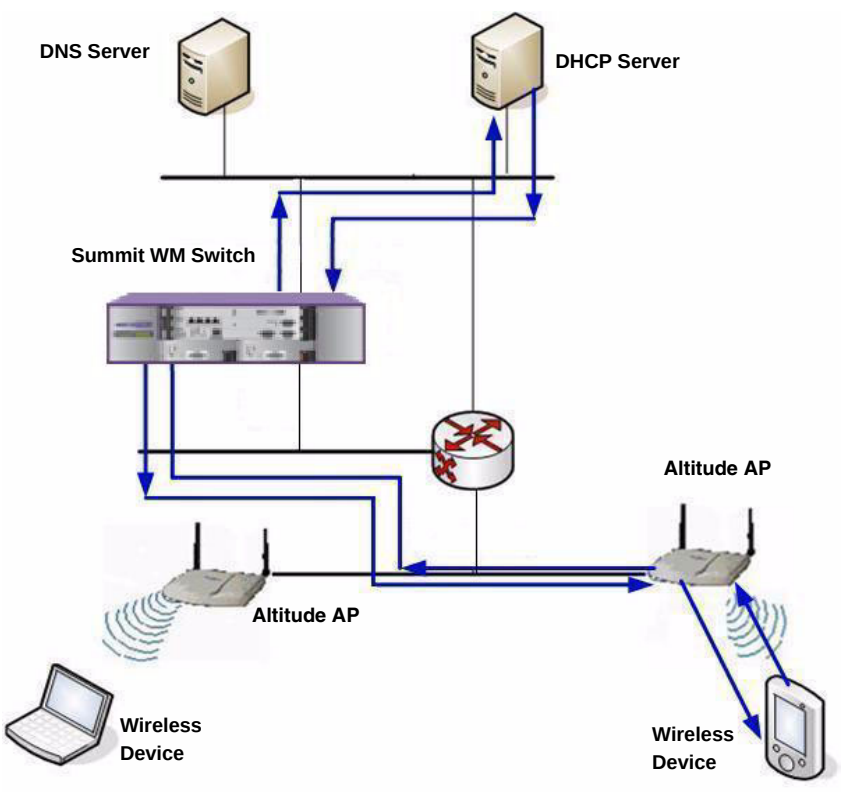


Figure 3 DHCP for WM-AD

The DHCP configuration for WM-AD is done via Summit WM Switch. For more information, see Section 8.2, “Creating and configuring a Routed WM-AD”, on page 97.

2.1.5.3 DHCP relay for WM-AD



* A wireless device sends a request for IP address to Altitude AP
* The Altitude AP forwards the request to Summit WM Switch via WM-AD tunnel
* The Summit WM Switch relays the request to the DHCP server
* The DHCP server responds by sending the IP address to the Summit WM Switch
* The Summit WM Switch relays the IP address to the Altitude AP
* The Altitude AP sends the IP address to the wireless device

Figure 4 DHCP relay for WM-AD

The DHCP relay configuration is done via Summit WM Switch. For more information, see Section 8.2, “Creating and configuring a Routed WM-AD”, on page 97.

2.1.5.4 DHCP for traffic bridged locally at Altitude AP

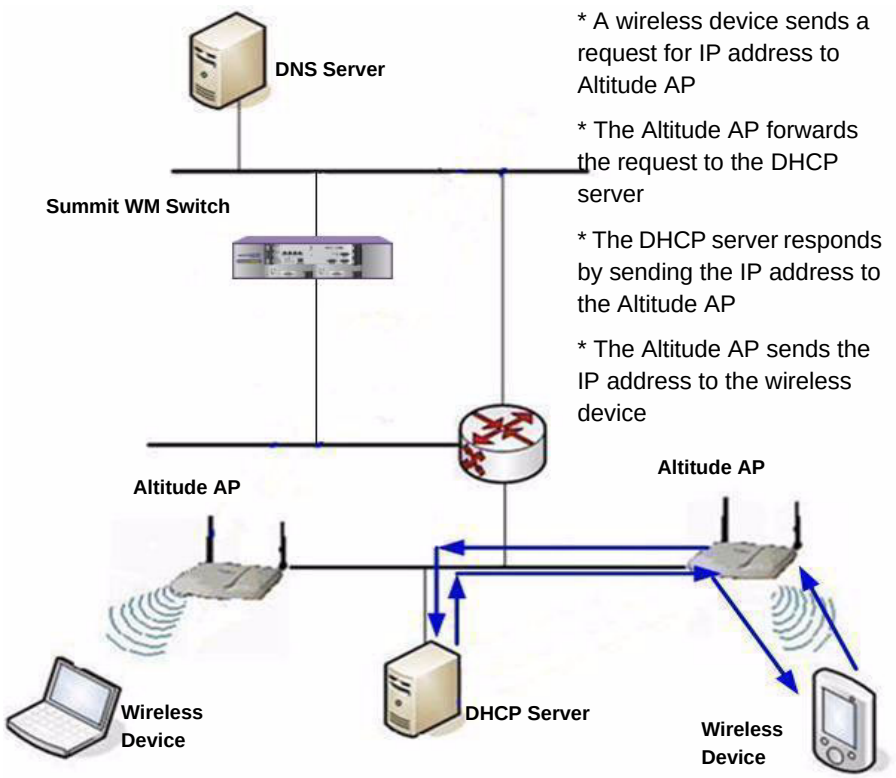


Figure 5 DHCP for traffic bridged locally at Altitude AP

The DHCP relay configuration is done via Summit WM Switch. For more information, see Section 8.4, "Creating and configuring a Bridge Traffic Locally At WAP WM-AD", on page 101.

2.2 Summit WM Switch's physical description

This section provides a physical description of the Summit WM Switch.

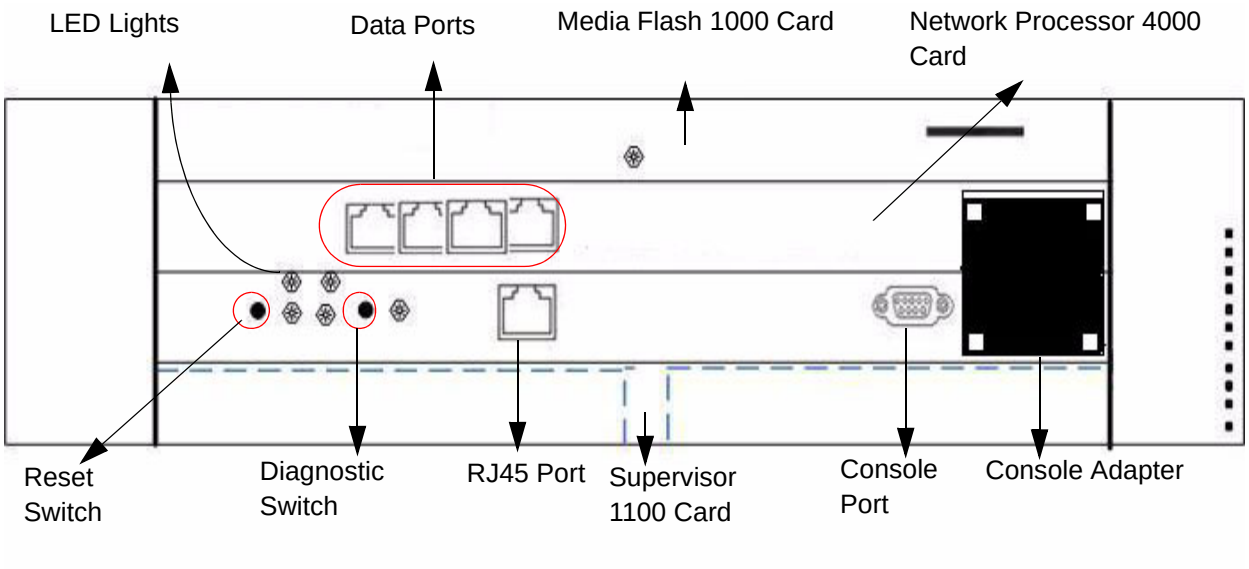
2.2.1 Summit Switch WM2000 front panel

The Summit Switch WM2000is composed of the following three cards:

- Media Flash 1000 (MF 1000)
- Network Processor 4000 (NP 4000)
- Supervisor 1100 (SC 1100)

The following figure identifies the main components on the front panel of Summit Switch WM2000

Figure 6 Summit Switch WM2000 front panel



The Summit Switch WM2000 has five LED lights and two switches on its front panel.

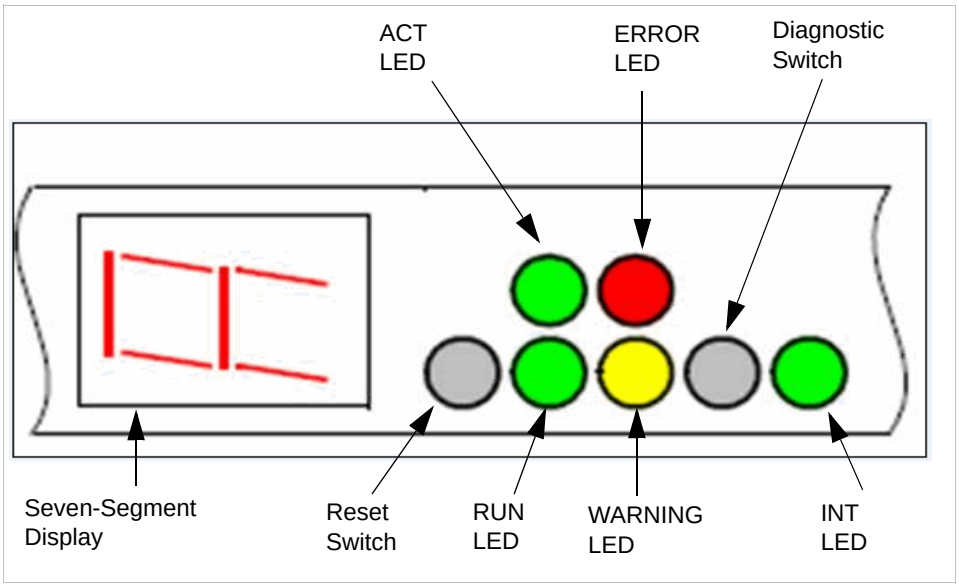


Figure 7 Summit Switch WM2000's LED lights and switches

The description of the LED states and switches is provided below:

- Reset Switch – Reboots the system.

- RUN LED – Indicates the CPU's initialization has completed and the system is ready to provide application level services.
- ACT LED – Indicates the system's software is in active running state.
- WARNING/ERROR LEDs – Indicate a problem in the running state of the system.
    - Whenever either of the alarm LEDs is lit, the seven-segment display provides the corresponding code point for the error indication. When the system is fully active and running, the console displays the letter **A** as seen in Figure 7.
- Diagnostic Switch – Pressing the **Reset** and **Diagnostic** switch simultaneously reboots the system in diagnostic mode.

Note: The diagnostic switch should be used only upon the request of a service technician.

- INT LED – Not used in the current release.

2.2.1.1 LED states and Seven Segment Display (SSD) codes

Application initialization

Active LED	Warning LED	Error LED	SSD Code	Condition
Green			0	Application initialization started.
Green			1	Forwarding Engine initialization complete. Application initialization.
Green			A	Application initialization complete. System active.
Green			H	System halted. Administrator requested halting of system.

Table 1 LED states and SSD codes during application initialization

Warning conditions

Active LED	Warning LED	Error LED	SSD Code	Condition
Green	Yellow		1	High temperature reached.
Green	Yellow		2	Fan unit failure. Rotation counter indicates zero speed for one of the lateral trays. May be the result of fan tray removal.

Table 2 LED states and SSD codes during warning conditions

Active LED	Warning LED	Error LED	SSD Code	Condition
Green	Yellow		3	Power supply failure. Failed to detect one of the power supplies. May be the result of the fan tray removal of one of the power supplies.
Green	Yellow		4	FDD low sector count (40 backup sectors remaining).
Green	Yellow		5	FDD extremely low sector count (20 backup sectors remaining)

Table 2 LED states and SSD codes during warning conditions

Error conditions:

Active LED	Warning LED	Error LED	SSD Code	Condition
Green		Red	1	Failed to identify FDD. Possibly due to removal of FDD card.
Green		Red	2	Failed to initialize NPE card.
Green		Red	3	Critical threshold reached (95C for NPE). The system will reboot.
Green		Red	4	Full fan assembly failure (both trays). The system will reboot.
Green		Red	5	Application initialization failure. Startup manager failed to initialize all the components of the system. The system will reboot.
Green		Red	6	Lost connectivity with ethernet interface. Possible failure of NPE card. The system will reboot.
Green		Red	7	MF 1000 card failure. Backup sectors exhausted.
Green		Red	8	NP 4000 card initialization failure. Firmware self test (BIST) has detected failure in one or more components (memory, bus, interconnects)

Table 3 LED states and SSD codes during error conditions

2.2.2 Summit Switch WM2000 back panel

The following figure identifies the main components on the back panel of Summit WM Switch WM2000.

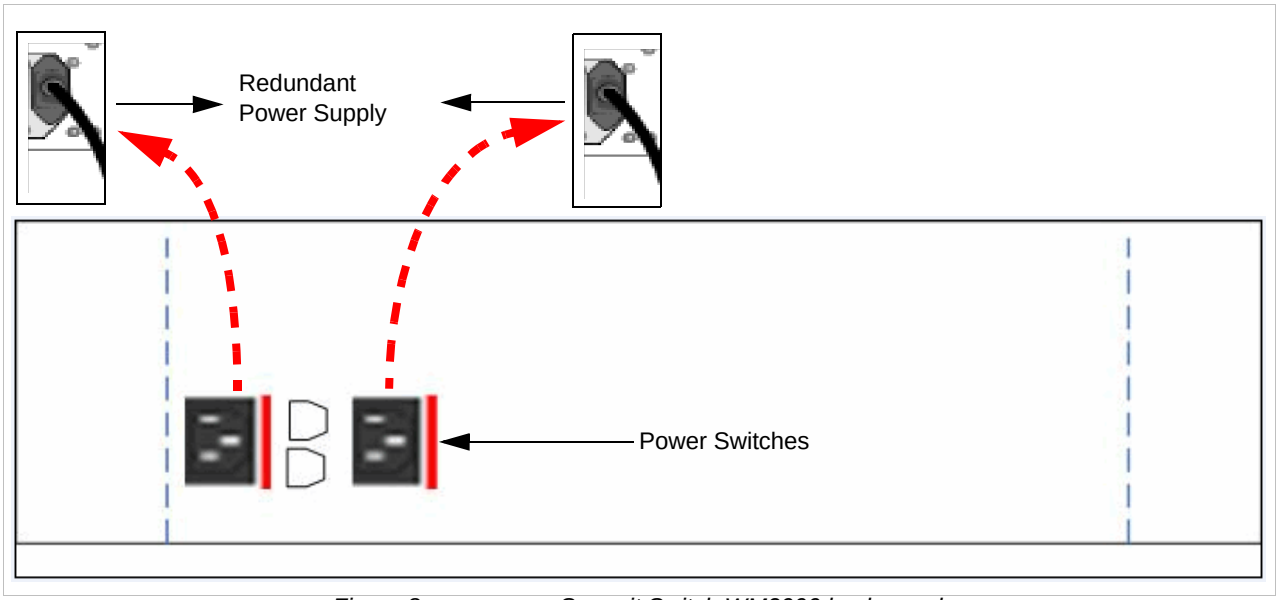


Figure 8 Summit Switch WM2000 back panel

Figure 9

Note: The hardware for the Summit Switch WM200 and the Summit Switch WM2000 are identical. For more information, see Section 2.2.1, "Summit Switch WM2000 front panel", on page 20 and Section 2.2.2, "Summit Switch WM2000 back panel", on page 24.

2.2.3 Summit Switch WM1000 front panel

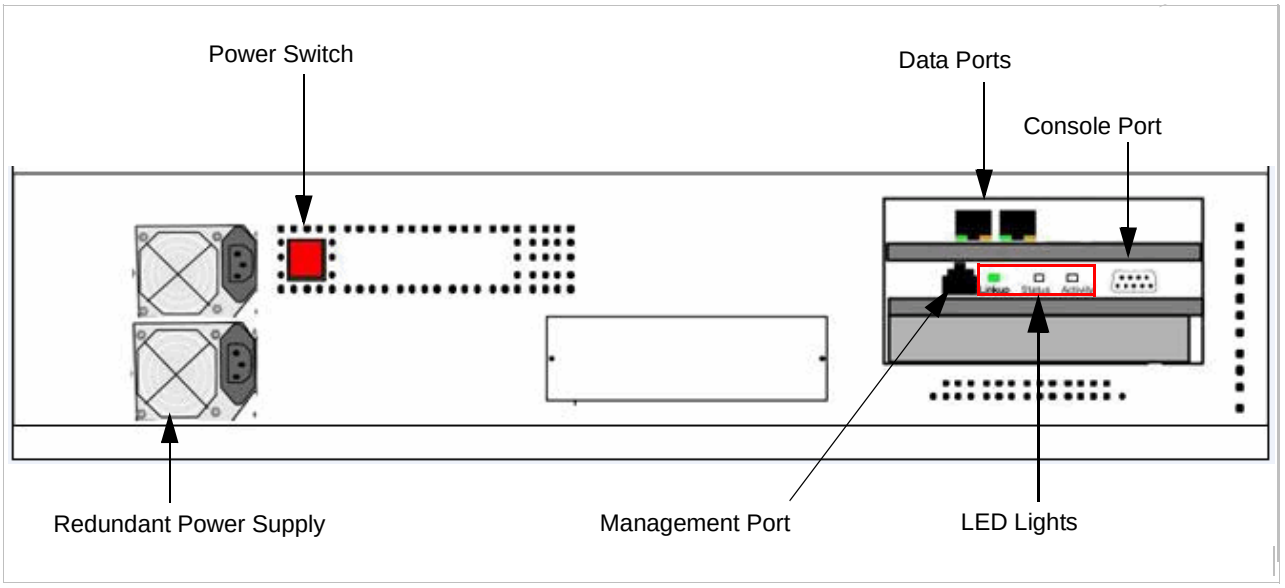
The Summit Switch WM1000 doesn't have any component on the front panel except two LED lights. These two LED lights are:

- STATUS LED – For more information, see the STATUS LED description in Section 2.2.4, "Summit Switch WM1000 back panel", on page 25.
- ACTIVITY LED – For more information, see the ACTIVITY LED description in Section 2.2.4, "Summit Switch WM1000 back panel", on page 25.

These two LED lights are also located on the back panel of the Summit Switch WM1000.

2.2.4 Summit Switch WM1000 back panel

The following figure identifies the main components on the back panel of Summit Switch WM1000.



Note: *Summit Switch WM1000 back panel* The Summit Switch WM1000may have a standard power supply (one power supply) or a redundant power supply (two power supplies).

The Summit Switch WM1000has three LED lights on its back panel.

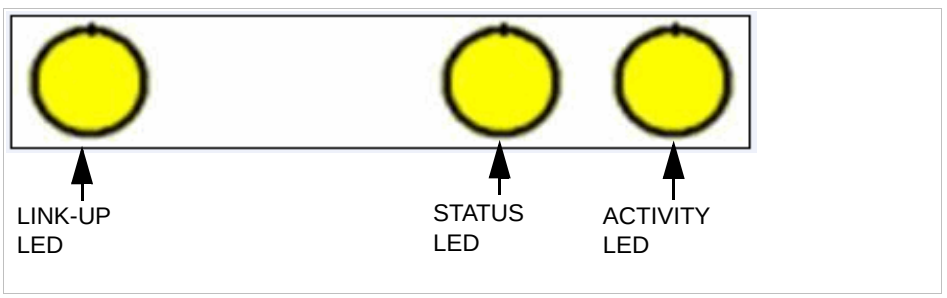


Figure 10 Summit Switch WM1000 LED lights

The description of the LED states is provided below:

- LINK-UP LED – Displays the link status of management port Ethernet link as seen by the system's software. This LED is located only on the back panel of the Summit Switch WM1000.

- STATUS LED – Indicates the normal state of the Summit WM Switch as seen by the system's software. This LED covers all stages of the Summit WM Switch, ranging from restarting, to shutting-down. As long as the Summit WM Switch is running normally, this LED will remain lit. The STATUS LED is located on the back panel as well as the front panel.
- ACTIVITY LED – Indicates the amount of traffic carried to and from the Altitude APs. The ACTIVITY LED is located on the back panel as well as the front panel.

2.2.5 Summit Switch WM100 front panel

The Summit Switch WM100does not have any component on the front panel except two LED lights.

The description of the LED states is provided below:

- STATUS LED– For more information, see the STATUS LED description in Section 2.2.4, "Summit Switch WM1000 back panel", on page 25.
- ACTIVITY LED – For more information, see the ACTIVITY LED description in Section 2.2.4, "Summit Switch WM1000 back panel", on page 25.

The STATUS LED is located on the back panel as well as the front panel of the Summit Switch WM100.

2.2.6 Summit Switch WM100 back panel

The following figure identifies the main components on the back panel of Summit Switch WM100.

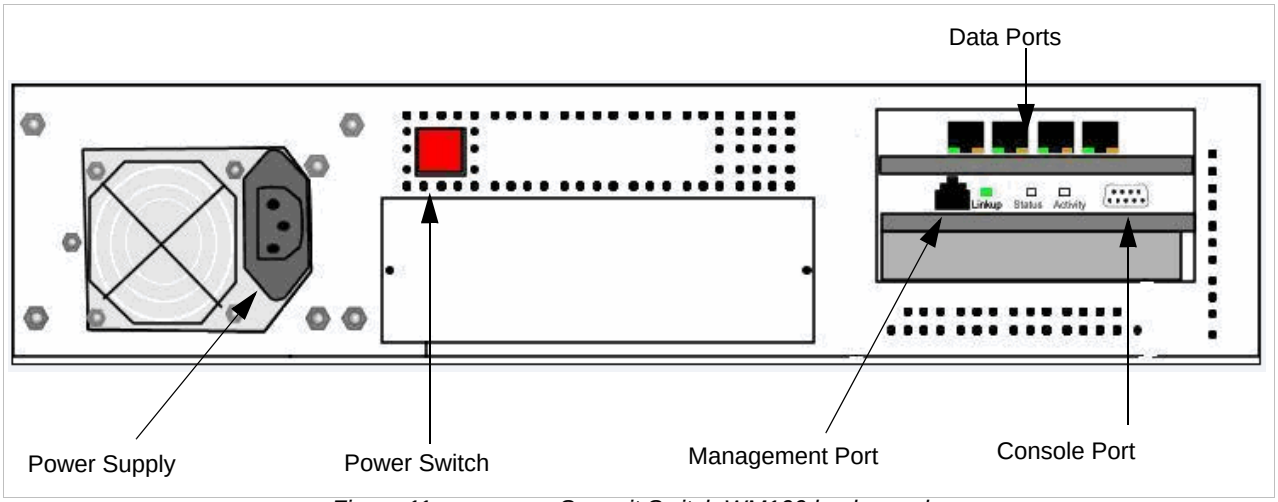


Figure 11 Summit Switch WM100 back panel

Note: The Summit Switch WM100 has the same number of LED lights on the back panel as the Summit Switch WM1000. The LED description of their state is also identical to WM1000. For information on Summit Switch WM100's LEDs' states, see the descriptions of STATUS LED and ACTIVITY LED in Section 2.2.4, "Summit Switch WM1000 back panel", on page 25.

Note: The Summit Switch WM100 may have a standard power supply (one power supply) or a redundant power supply (two power supplies).

2.3 Collecting information for installation

You must use the following table to document all the pertinent information about the Summit WM Switch before starting the installation process.

Some of the information listed in the table may not be relevant to your network configuration. You must only record the information that is pertinent to your network configuration.

Configuration data	Description	Your entry

Accessing the Summit WM Switch for the first time	• **Unused IP address in the 192.168.10.0/24 subnet** – This IP address must be assigned to the Ethernet port of your laptop computer. You can use any IP address between 192.168.10.2 and 192.168.10.255.
	• **Factory default IP address of Summit WM Switch** – The factory default IP address is `https//192.168.10.1:5825`. You must type this IP address in the address bar of your Web browser when you access the Summit WM Switch for the first time.
	• Login Information – The login information is as follows:
	  • **User Name**: `admin`
	  • **Password**: `abc123`	

Management Port information	• **Hostname** – Specifies the name of the Summit WM Switch. • **Domain** – Specifies the IP domain name of the enterprise network. • **Management IP Address** – The new IP address for the Summit WM Switch's management port. Change the value in this text box to the IP address assigned to the Summit WM Switch's management port by your network administrator. • **Subnet Mask** – The subnet mask for the IP address to separate the network portion from the host portion of the address (typically 255.255.255.0) • **Management Gateway** – The default gateway of the network. • **Primary DNS** – The primary DNS server used by the network. • **Secondary DNS** – The secondary DNS server used by the network.	
Hardware information	• **MAC Address** – MAC address of the Summit WM Switch's management port • **Serial #** – The Summit WM Switch's serial #.	
License Key (File)	An *.xml* file that is provided along with the product. This file must be applied to the product to enable all the functionalities.	

Table 4 Information gathering table

Configuration data	Description	Your entry

Data Ports information	• **IP address** – IP address of the physical ethernet port.
	• **Subnet mask** – Subnet mask for the IP address, which separates the network portion from the host portion of the address (typically 255.255.255.0).
	• **MTU** – The maximum transmission unit or maximum packet size for this port. The default setting is 1500. If you change this setting, and are using OSPF, you must make sure that the MTU of each port in the OSPF link matches.
	• **Function** – The port's function.
	  • **Host Port** – A port for connecting Altitude APs with no dynamic routing.
	  • **Third-party AP Port** – A port to which the third-party AP is connected.
	  • **Router Port** – A port that connects to an upstream, next-hop router in the network.
	• **VLAN ID** – The ID of the VLAN to which the AP is connected.	

Static Routing	**Static IP address** – The static IP address that is assigned to the Summit WM Switch when it is configured for static routing.	
OSPF Routing	• **Router ID** – The router ID is its own IP address. You must record the Summit WM Switch's IP address here. • **Area ID of OSPF** – Id of OSPF's area. 0.0.0.0. is the main area in OSPF. • **OSPF Authentication Password** – If you select **Authentication** type as **Password**, then you will need a password.	

DHCP Service	• **IP address range** – This is the range from which the IP address will be distributed across the network.
	  • **Start IP address** – This is the start IP address of the range.
	  • **End IP address** – This is the end IP address of the range.
	• **Lease duration** – The DHCP server assigns a client an IP address for a given amount of time. The amount of time for which the IP address can be given is called lease duration.
	  • **Days** – The number of days for which the lease can be given.
	  • **Hours** – The number of hours for which the lease can be given.
	  • **Minutes** – The number of minutes for which the lease can be given.	

IP Address for installing DHCP service	**IP Address** – If you are using WM-AD, you will need the WM-AD's IP address. If you are not using WM-AD, you will need the Summit WM Switch IP address.	

Table 4 Information gathering table

Configuration data	Description	Your entry
WM-AD gateway for installing DHCP service	**WM-AD gateway** – If you are using WM-AD, you will need the WM-AD gateway.	
Domain name for installing DHCP service	**Domain name** – Your organization's domain name.	
Windows 2003 Server's IP address	**IP address** – The IP address of Windows 2003 Server.	
SLP DA's IP address	**Hexa values of SLP DA's IP address** – The Altitude APs use the SLP DA to discover the Summit WM Switch . The mobility agents use the SLP DA to discover the mobility manager. The hexa values of the SLP DA's IP address.	
Internet Protocol configuration for DNS Service in Windows 2003 server	• **Static IP address** – Windows 2003 server's static IP address. • **Subnet Mask** – Subnet mask of Windows 2003 server's static IP address. • **Gateway** – Windows 2003 server's gateway. • **ISP's IP address** – Your ISP's (Internet Service Provider) IP address. • **IP address**– Summit WM Switch's IP address.	
Port information for installing IAS in Windows 2003 server	• **Authentication Port** – Summit WM Switch's used to access the IAS service. • **Accounting Port** – Type the Summit WM Switch's port # that is used to access the accounting service. The values you record here should match what you define in the **Port** text box of **Auth** section in the **Acc & Acct** tab of Summit WM Switch's WM-AD screen.	
Altitude AP's properties	• **Summit WM Switch's Port #** – Summit WM Switch's ethernet port to which the Altitude AP is connected. • **Country** – The country where the Altitude AP operates. • **Serial #** – A unique identifier that is assigned during the manufacturing process of the Altitude APs. • **Hardware version** – The current version of the Altitude AP hardware. • **Application version** – The current version of the Altitude AP software. • **VLAN ID** – The ID of the VLAN on which the Altitude AP operates.	

Table 4 Information gathering table

Configuration data	Description	Your entry
Local DHCP Server In Routed WM-AD	• **Gateway** – The Summit WM Switch advertises this address to the wireless devices when they sign on and get a dynamic IP address. The gateway corresponds to the IP address that is communicated to mobile users. • **Subnet mask** – Subnet mask for the gateway IP address to separate the network portion from the host portion of the address (typically 255.255.255.0). • **Address range** – The range from which the IP addresses are provided to the wireless devices that use the WM-AD. • **External enterprise domain name** – The external enterprise domain name. • **DNS Server IP address**– The IP address of the domain name server on the enterprise network.	
DHCP Relay in Routed WM-AD	• **Gateway** – The Summit WM Switch advertises this address to the wireless devices when they sign on and get a dynamic IP address. The gateway corresponds to the IP address that is communicated to mobile users. • **Subnet mask** – Subnet mask for the gateway IP address to separate the network portion from the host portion of the address (typically 255.255.255.0). • **DHCP Server IP address(es)** – IP addresses of the external DHCP servers on the enterprise network.	
Next Hop Routing for Routed WM-AD	• **Next hop IP address** – The next-hop IP identifies the target device to which all WM-AD (user traffic) will be forwarded to. Next-hop definition supersedes any other possible definition in the routing table. • **OSPF routing cost** – The OSPF cost value provides a relative cost indication to allow upstream routers to calculate whether or not to use the Summit WM Switch as a better fit, or lowest cost path to reach the devices in a particular network. The higher the cost, the less likely that the Summit WM Switch will be chosen as a route for traffic, unless that Summit WM Switch is the only possible route for that traffic	
VLAN Information for Bridge Traffic Locally at SWM WM-AD	• **VLAN ID** – The ID # of VLAN that is mapped to a Summit WM Switch interface. • **Interface** – The name of the interface to which the VLAN is mapped. • **Interface IP address** – The interface's IP address. • **Mask** – The subnet mask of the WM-AD.	
VLAN ID for Bridge traffic locally at WAP WM-AD	• VLAN ID – The ID #of VLAN that is mapped to a Summit WM Switch interface.	

Table 4 Information gathering table

Configuration data	Description	Your entry
Authentication and Accounting information for captive portal configuration	• **Port** – Used to access the RADIUS server. The default is 1812. • **# of Retries** – The number of times the Summit WM Switch will attempt to access the RADIUS server. • **Timeout** – The maximum time for which Summit WM Switch will wait for a response from the RADIUS server before making a re-attempt. • **NAS Identifier** – A RADIUS attribute that identifies the server responsible for passing information to the designated servers and then acting on the response returned. This is optional.	
Internal captive portal settings information	• **Login Label** – The text that will appear as a label for the user name. • **Password Label** – The text that will appear as a label for the user password text box. • **Header URL** – The URL of the file to be displayed in the header of the Captive Portal screen. • **Footer URL** – The URL of the file to be displayed in the footer of the Captive Portal screen. • **Message** – The message that you type in this text box will be displayed above the **Login** text box to greet the user. You can type a message, explaining why the Captive Portal screen is used and the instructions for the user. • **Replace Gateway IP with FQDN** – If you are using FQDN (Fully Qualified Domain Name) as the gateway address, document the FQDN. • **Default Redirection URL** – The URL to which the wireless devices will be directed before authentication.	
Shared Secret Password for external captive portal configuration	**Password** – This password encrypts the information exchanged between the Summit WM Switch and the external Captive Portal server.	
MAC-based authentication information	• **Port** – The port used to access the RADIUS server. The default is 1812. • **# of Retries** – Number of times the Summit WM Switch will attempt to access the RADIUS server. • **Timeout** – The maximum time for which Summit WM Switch will wait for a response from the RADIUS server before making a re-attempt. • **NAS IP Address** – IP address of the network access server (NAS).	
Exception filter rules information	**IP/subnet** – The destination IP address. You can also specify the IP range, a port designation or a port range on the IP address here.	
Static WEP privacy information	• **WEP Key Length** – Size of a WEP key. • **Strings** – This is the secret WEP key string.	

Table 4 Information gathering table

Configuration data	Description	Your entry
WPA-PSK privacy information	• **Broadcast re-key interval** – The time interval (in seconds) after which you want the broadcast encryption key to be changed automatically. The default is 3600. • **Pre-shared Key** – The shared secret key that is to be used between the wireless device and the Altitude AP. The shared secret key is used to generate the 256 bit key.	
Dynamic WEP privacy information	**Broadcast re-key interval** – The time interval (in seconds) after which you want the broadcast encryption key to be changed automatically. The default is 3600.	
Availability information	• **Primary Summit WM Switch's IP address** • **Secondary Summit WM Switch's IP address** • **IP address of primary Summit WM Switch's physical port** • **IP address of secondary Summit WM Switch's physical port**	
Mobility manager information	• **Port** – The interface of the Summit WM Switch that is to be used as the mobility manager. Ensure that the selected interface is routable on the network. • **Heartbeat** – The time interval (in seconds) at which the mobility manager sends a heartbeat message to the agent. The default is 5.	

Mobility agent information	• **Port** – The interface of the Summit WM Switch that is to be used as the mobility agent.
	Ensure that the selected interface is routable on the network.
	• **Heartbeat** – The time interval (in seconds) for which the mobility agent should wait for the connection establishment response before trying again. The default is 60.
	• **Discovery Method** – The method by which the mobility agent will discover the mobility manager. You have the following two options:
	  • **SLPD** (Service Location Protocol Daemon) – Enables the discovery of mobility manager Summit WM Switch, using SLP. The mobility manager's address must be configured on the network using SLP when selecting this option.
	  • **Static Configuration** – Allows the mobility agent to discover the mobility manager without the SLP support. If you select **Static Configuration**, you will need the IP address of the Summit WM Switch that will serve as the mobility manager.	

Table 4 Information gathering table

3 Summit WM-Series WLAN Switch configuration

This chapter explains how to configure the Summit WM-Series WLAN Switch's settings to make it operational.

The topics in this chapter are organized as follows:

3.1 Accessing the Summit WM-Series WLAN Switch for the first time

You can access the Summit WM-Series WLAN Switch (Summit WM Switch) by using a laptop computer with a Web browser.

To access the Summit Switch using a web-enabled laptop:

1. Connect the Summit WM Switch's management port to the web-enabled laptop computer with a cross-over RJ 45 Ethernet cable.
2. Statically assign an unused IP address in the 192.168.10.0/24 subnet for the Ethernet port of the laptop computer.

   You can use any IP address between 192.168.10.2 and 192.168.10.255.
3. Launch your web browser.

4. In the address bar, type `https//192.168.10.1:5825`. The **Extreme Networks Summit WM-Series Console** login screen is displayed.

5. In the **User Name** text box, type `admin`.
6. In the **Password** text box, type `abc123`.
7. Click **Login**. The **Extreme Networks Summit WM-Series Console** is displayed.

Note: In the footer of the Extreme Networks Summit WM-Series Console, the following is displayed:
•**[host name | product name | up time]**
•For example, [WM2000 | WM2000 | 1 days, 1:11]. If there is no key (unlicensed), **UNLICENSED** is displayed besides the software version.
•**User** is the user id you used to login in. For example, admin.
•**Port Status** is the connectivity state of the port. **M** is for the Management interface, which is on eth0 and the numbered lights reflect the esa ports on the system. Green indicates the interface is active and running. Red indicates the interface is down.

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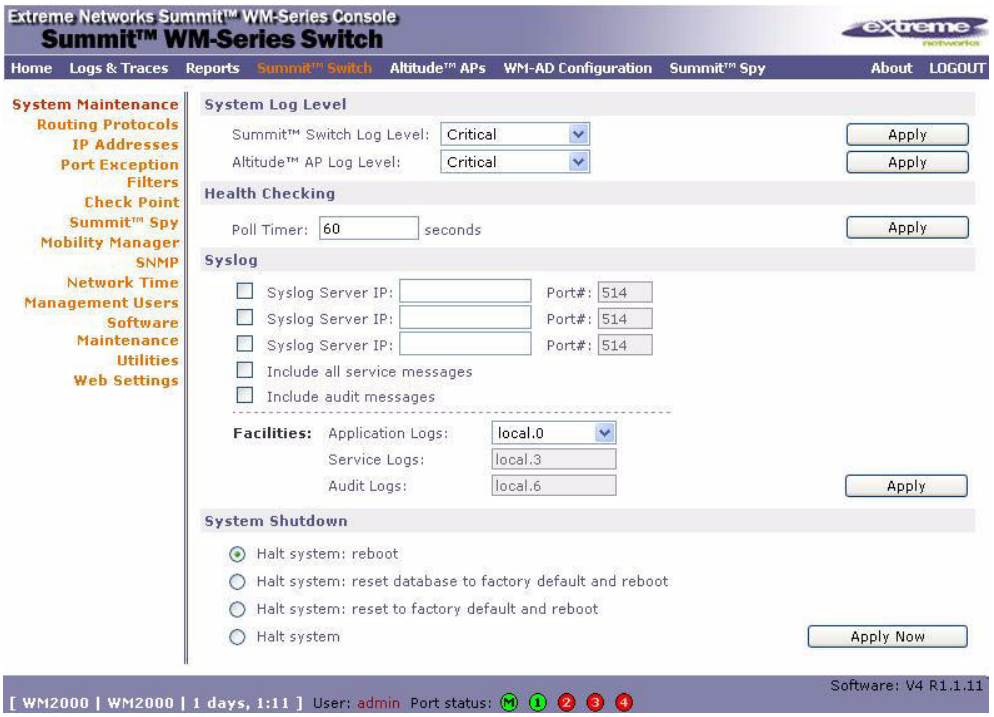
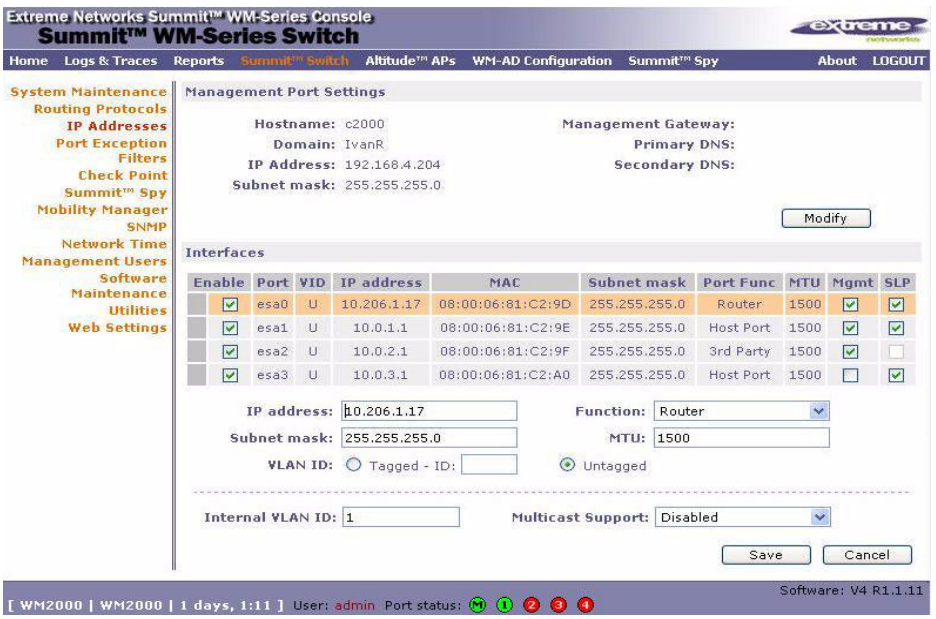
8. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.

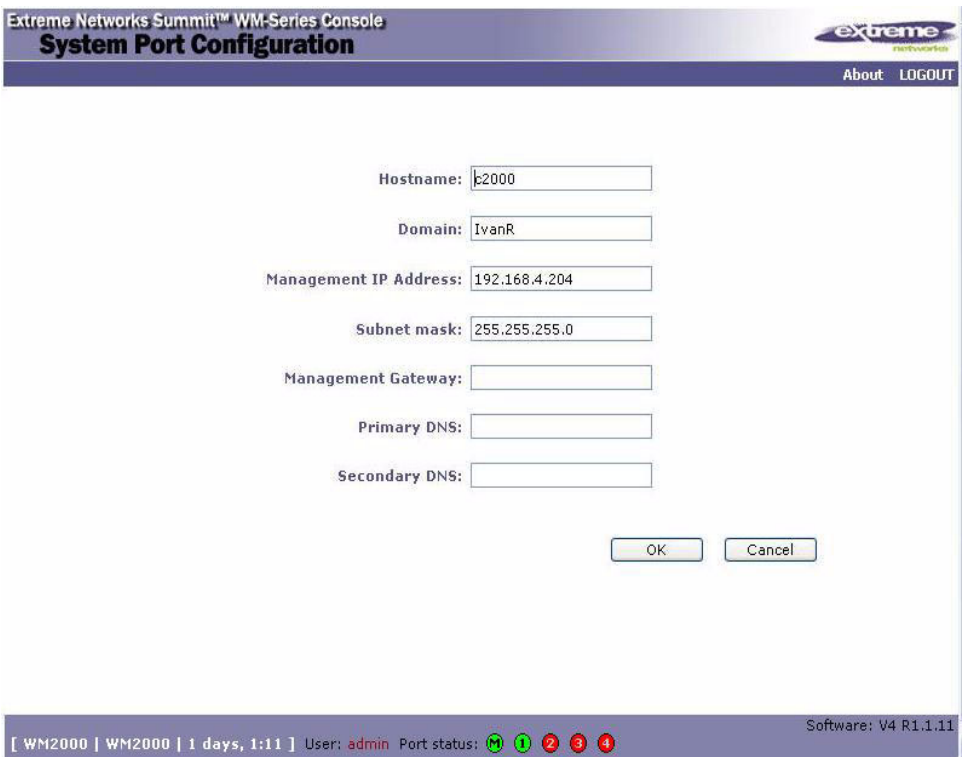


9. In the left pane, click **IP Addresses**. The factory default settings for the Summit Switch are displayed.



Note: Only the following models support VLAN:
• Summit Switch WM2000
• Summit Switch WM200

10. In the **Management Port Settings** section, click **Modify**. The **System Port Configuration** screen is displayed.



11. Type the following information:

    - **Hostname** – Specifies the name of the Summit Switch by which it will be known. You must assign a unique name for the Summit Switch.
    - **Domain** – Specifies the IP domain name of the enterprise network.
    - **Management IP address** – Specifies the new IP address for the Summit WM Switch's port. Change the value in this text box to the IP address assigned to the Summit WM Switch's management port by your network administrator.
    - **Subnet Mask** – Specifies the subnet mask for the Summit WM Switch's management port. Change the value in this text box to the value provided by your network administrator.

- **Management Gateway** – Specifies the default gateway of the network as provided by the network administrator.
- **Primary DNS** – Specifies the primary DNS server used by the network as provided by your network administrator as provided by your network administrator. This field is optional.
- **Secondary DNS** – Specifies the secondary DNS server used by the network as provided by your network administrator. This field is optional.

12. Click **OK**.

Note: The Web connection between the computer and the Summit Switch is lost. The IP addresses are now set to the network you defined.

Now you must connect the Summit Switch to the enterprise network. The following section explains how to connect the Summit Switch to the enterprise network.

3.2 Connecting the Summit WM Switch to the enterprise network

To connect the Summit Switch to the enterprise network:

1. Disconnect your laptop computer from the Summit Switch management port.
2. Connect the Summit Switch management port to the enterprise Ethernet LAN. The Summit Switch resets automatically.
3. Log on to the Extreme Networks Summit WM-Series Console from any computer on the enterprise network. Type the following URL in a browser to access the Extreme Networks Summit WM-Series Console: `tap://<IP Address>:5825`

Before you proceed further, you must change the default administrator password. The following section explains how to change the default administrator password.

3.3 Changing the administrator password

To change the administrator password:

1. Login on the Summit Switch using the default administrator password.
2. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.
3. In the left, click **Management Users.**
4. In the user_admin table, click **admin**.

5. In the **Modify User Password** text box, type the new administrator password.
6. In the **Modify User Confirm Password** text-box, retype the new administrator password.
7. Click **Change Password**.

3.4 Configuring the network time

The internal clocks of the Summit Switch and Altitude APs on a network may differ. You **must** synchronize the clocks of the Summit Switch, and the Altitude APs in order for the system to operate properly.

The synchronization of clocks ensures accuracy in usage logs of the Summit Switch.

The Summit Switch provides you the following two options to synchronize the clocks of Summit Switch and the Altitude APs:

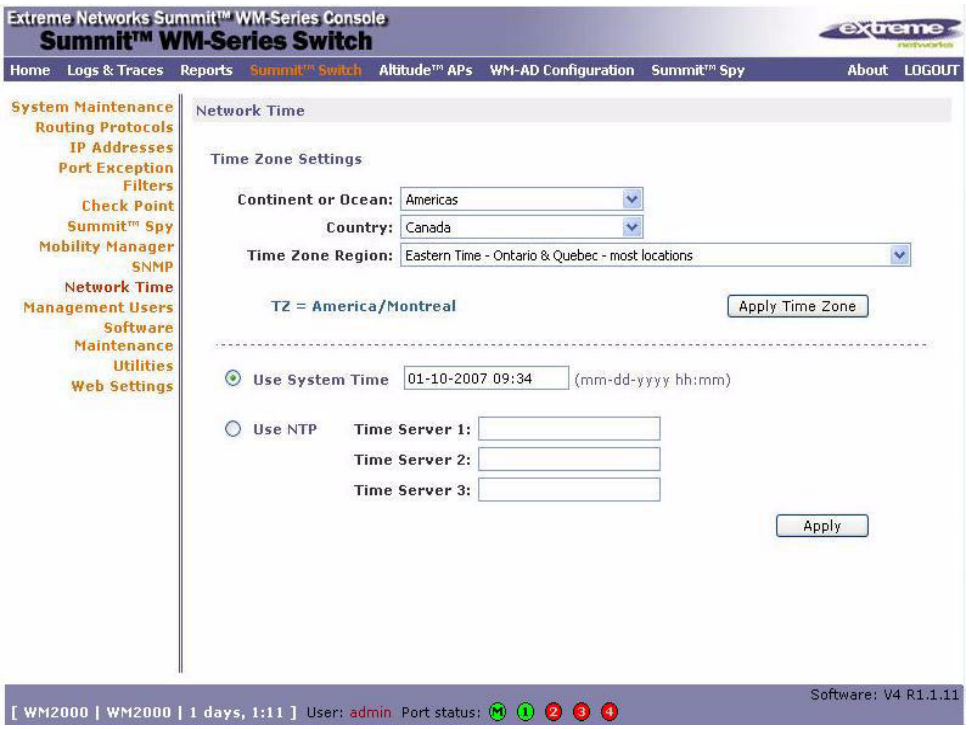
- Using the system's time – The system's time is the Summit Switch's time.
- Using the network time protocol (NTP) – The Network Time Protocol is a protocol for synchronizing the clocks of computer systems over packet-switched data networks.

3.4.1 Configuring the network time using the system's time

To configure the network time, using the system's time:

1. Login on the Summit Switch. The **Extreme Networks Summit WM-Series Console** screen is displayed.
2. Click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.

3. In the left pane, click **Network Time**. The **Network Time** screen is displayed.



4. From the **Continent or Ocean** drop-down list, click the appropriate large-scale geographic grouping for the time zone.
5. From the **Country** drop-down list, click the appropriate country for the time zone. The contents of the drop-down list change, based on the selection in the **Continent or Ocean** drop-down list.
6. From the **Time Zone Region** drop-down list, click the appropriate time zone region for the selected country.
7. Click **Apply Time Zone**.
8. Select the **Use System Time** radio button.

   You can modify the system's date and time by changing the entries in the **Use System Time** text box. The date is in **mm-dd-yyyy** format and the time is in **hh:mm** format.
9. Click **Apply**.
10. Reboot the Summit Switch. The WLAN network time is synchronized in accordance with the Summit Switch's time.

3.4.2 Configuring the network time using the NTP

To configure the network time using the NTP:

1. Perform Step 1 to Step 7 of Section 3.4.1, “Configuring the network time using the system’s time”.
2. Select **Use NTP** radio button.
3. In the **Time Server 1** text box, type the IP address or FQDN (Full Qualified Domain Name) of a NTP Time Server that is accessible on the enterprise network.
4. Repeat Step 3 for **Time Server2** and **Time Server3** text boxes.

   If the system is not able to connect to the **Time Server 1**, it will attempt to connect to the additional servers that have been specified in **Time Server 2** and **Time Server 3** text boxes.
5. Click **Apply**.
6. Reboot the Summit Switch. The WLAN network time is synchronized in accordance with the specified time server.

To ensure that all the functionalities are enabled, you must generate a software license key and apply it to the Summit WM Switch.

3.5 Generating a software license key

The license key is generated through the web-based Central Licensing Server (CLS).

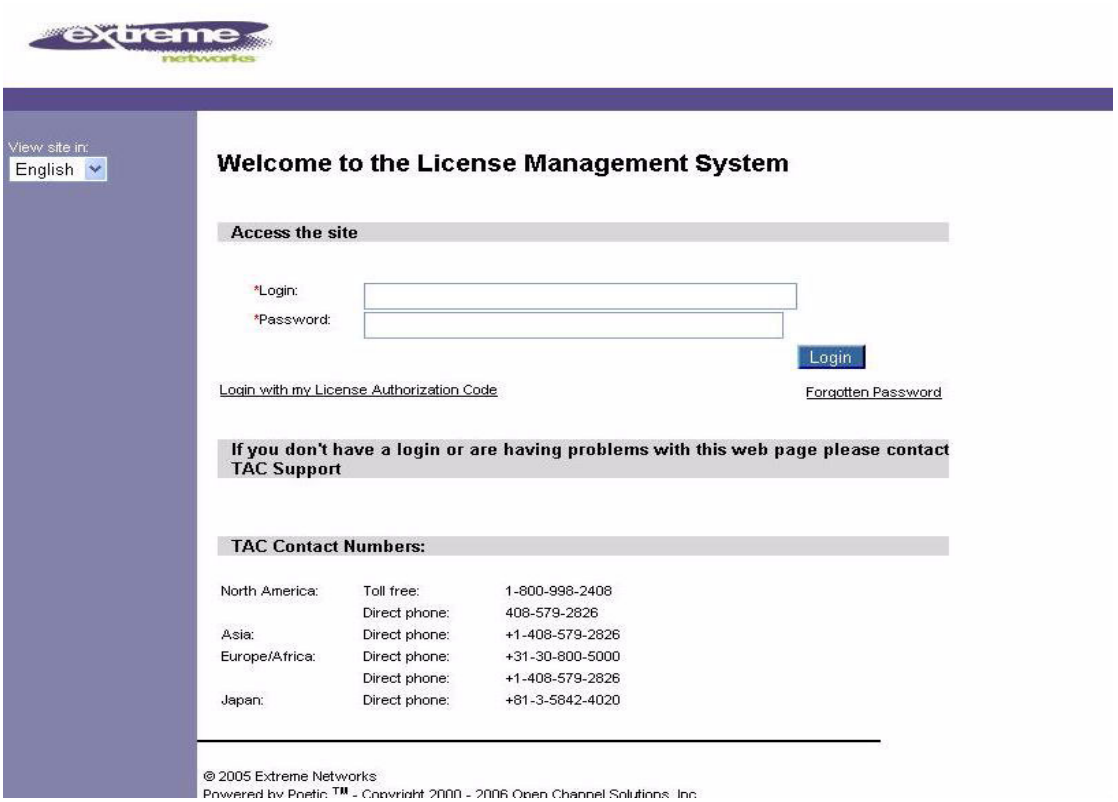
You must have the following information before you start the license generation process:

- CLS URL – Is provided in the *Summit WM Switch Base Software Activation* document.
- Login information (**User Name** and **Password)** – Is provided in the *Summit WM Switch Base Software Activation* document.
- MAC Address – Locate the MAC address on the rear panel of the Summit WM Switch.
- Serial Number – Locate the serial number on the rear panel of the Summit WM Switch.

- Regulatory Domain – Is a set of local regulations that control the Altitude APs' frequencies and power output. The regulations are specific to geographic locations. If you are located in North America, you are controlled by the North American Regulatory Domain. You must find out what is your regulatory domain.

To generate the software license key:

1. Login on the CLS. The **Login** screen is displayed.

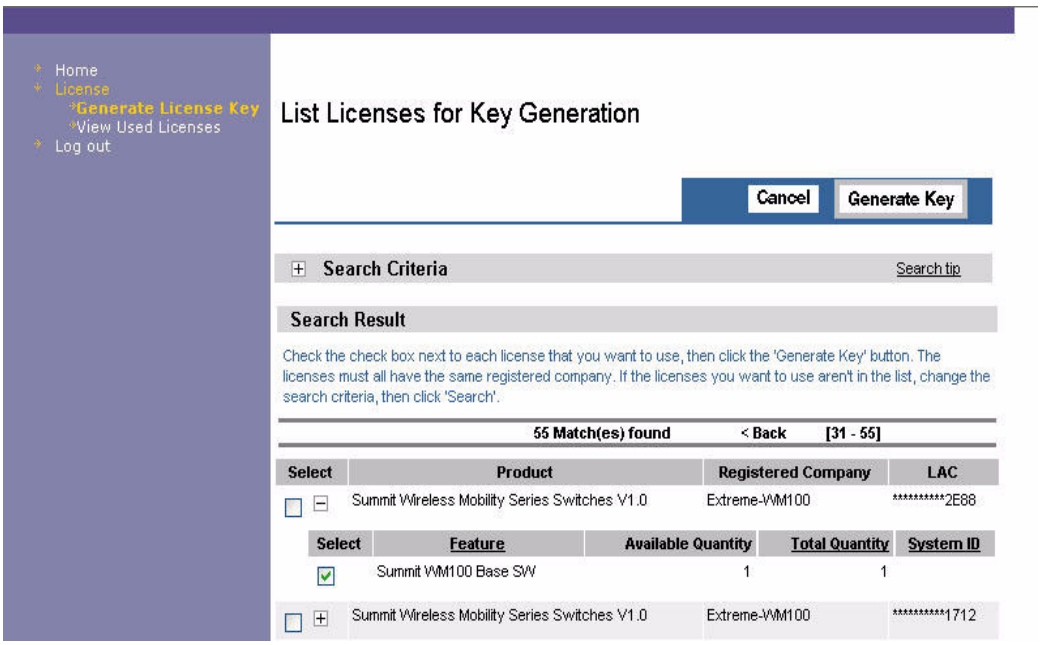


   If the content on the **Login** screen is in German, select **English** from the **View site in** drop-down menu in the left pane.

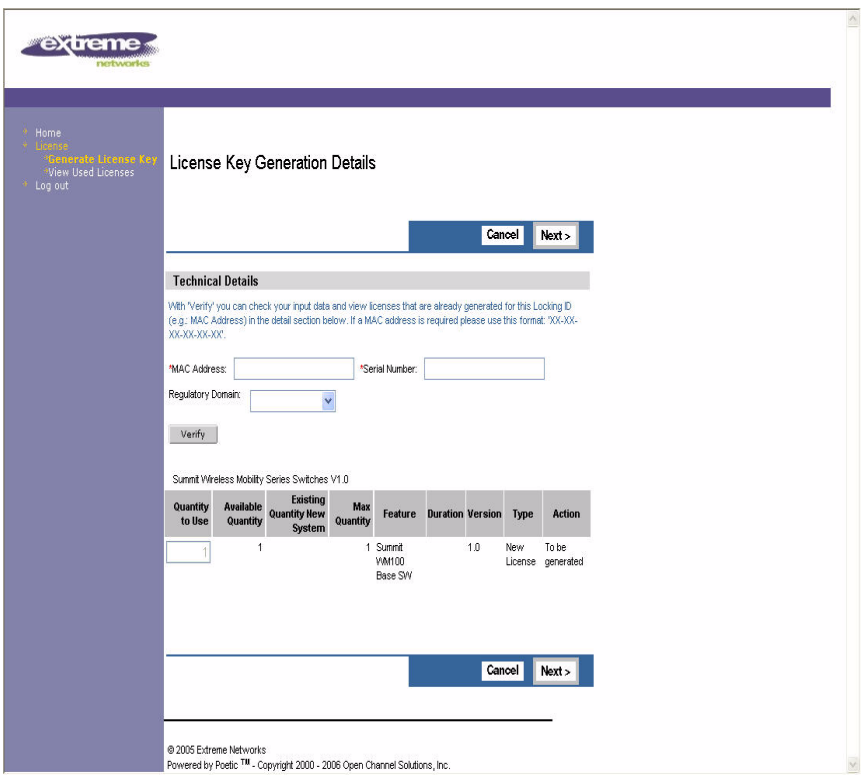
2. In the right pane, click **Generate and Download License Keys**. A list of licenses registered in your company's name is displayed.

3. Select the Summit Switch WM-Series WLAN Switch Software version for which you want to generate the license key.

   To view the software features, click the **+** node against the Summit Switch WM-Series WLAN Switch Software.



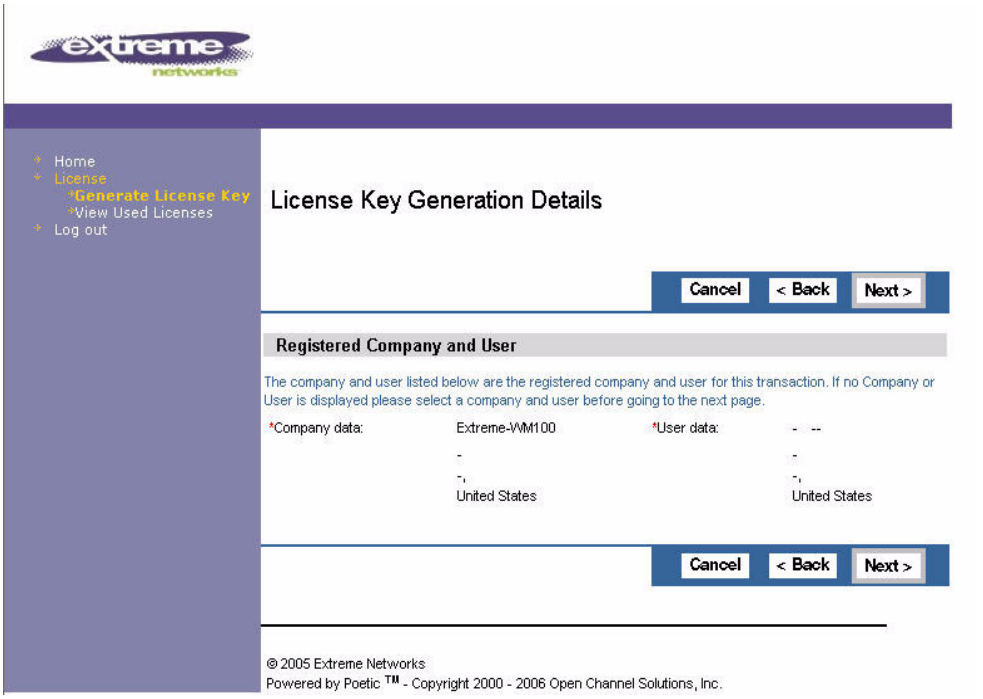
4. Click **Generate Key**. The **License Generation Key Details** screen is displayed.



5. In the **MAC Address** and **Serial Number** text boxes, type the MAC address and the serial number of the hardware.

6. In the **Regulatory Domain** drop-down list, click the regulatory domain.
7. Click **Verify**. The system verifies your inputs.

   If the system returns any error, you must resolve the error before proceeding.
8. Click **Next**. The **License Generation Details** screen is displayed.



9. Click **Next**. A legal notice is displayed.
10. Select **I agree with the above terms**, and then click **Finish**. The **Transaction Information** screen is displayed.
11. Click **License Key(s)**. The **License Key Details** screen is displayed.
12. In the **License Key (s)** section, click **Download**. The **File Download** window is displayed.
13. To save the file, click **Save**. The **Save As** window is displayed.
14. Save the file on your local drive.

Now that you have generated a software license key, you must apply this key to the hardware (Summit WM Switch). For more information, see Section 3.6, “Applying a license key”.

3.5.1 Retrieving a lost license key

If for some reason your license key (file) is corrupted or lost, you can retrieve a lost license key through the CLS. The following sub-section describes how to retrieve a lost license key.

To retrieve a lost license key:

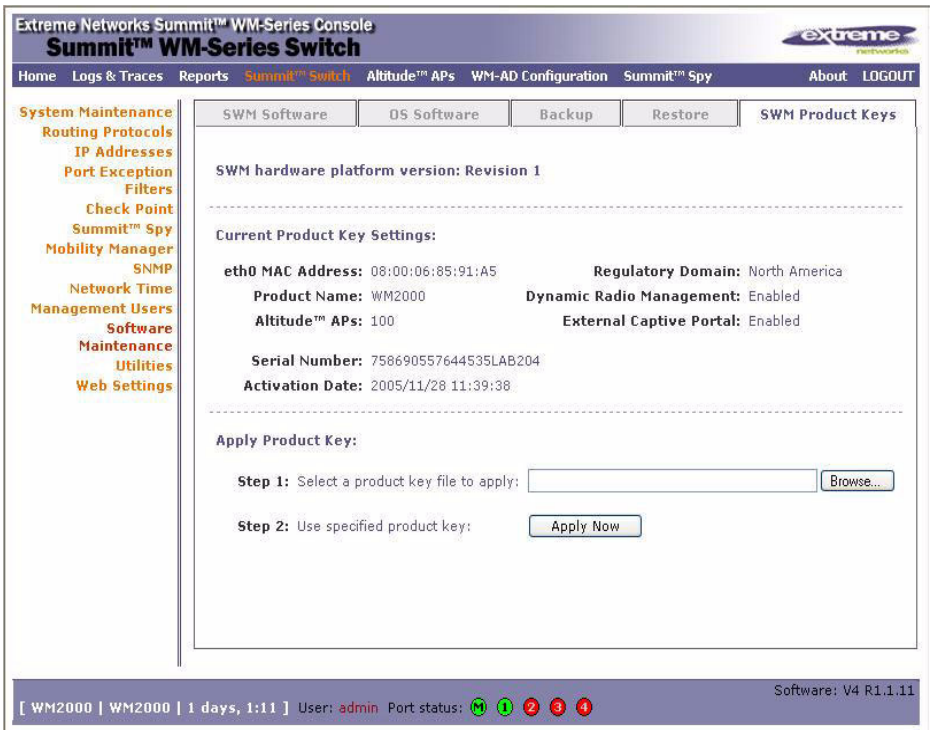
1. Login on the CLS. The **License Management** screen is displayed.
2. In the left menu, click **View Used Licenses**. A list of used licenses is displayed.
3. Locate the lost license in the list.
4. Select the applicable radio button for the product.
5. Click **View Details**. The **License Key Details** are displayed.
6. In the **License Key (s)** section, click **Download**. The **File Download** window is displayed.
7. To save the file, click **Save**. The **Save As** window is displayed.
8. Save the file on your local drive.

3.6 Applying a license key

To apply the license:

1. Login on the Summit Switch.
2. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.
3. In the left pane, click **Software Maintenance**.

4. Click the **SWM Product Keys** tab.



5. In the **Apply Product Key** section, click **Browse** to navigate to the location of the software license file, and select the file.

6. Click **Apply Now**. The software license key is applied, and the Summit Switch reboots.

Now you must configure the Summit WM Switch's physical ports. The following chapter describes how to configure the Summit WM Switch's physical ports.

4 Physical ports configuration

This chapter describes how to configure the Summit WM Switch's physical ports.

The topics in this chapter are organized as follows:

4.1 Physical data ports overview

Port configuration defines the administrative state of each interface. By default, the data interface states are disabled. You must enable each of the data interfaces individually. A disabled interface does not allow data to flow (receive/transmit).

You can define the data ports to function as one of the following three types:

- **Host Port** – You must use a **Host Port** definition to connect the Access Points with dynamic routing disabled. The dynamic routing is disabled to ensure that the port does not participate in dynamic routing operations to advertise the availability of virtual network segments (WM-AD) hosted by the SWM. Host ports may still be used as the target for static route definitions.
- **Third-party AP Port** – You must use a **Third-party AP Port** definition for a port to which you will be connecting the third-party APs. The third-party APs must be deployed within a segregated network for which the Summit WM Switch becomes the single point of access to the network. When you define a port as the third-party AP port, the interface segregates the third-party AP from the remaining network. Only one port can be configured for the third-party APs.
- **Router Port** – You must use a **Router Port** definition for a port that you will be connecting to an upstream, next-hop router in the network. When you define a port as the router port, the system knows that the particular interface is eligible to participate in dynamic routing protocol exchanges. The Summit WM Switch supports OSPF as the dynamic routing protocol.

The Summit WM Switch is shipped from the factory with all of its data ports set-up as host ports. You must set-up or configure how each port should function.

If the interface is directly attached to an existing VLAN, you must specify which VLAN the port belongs to by tagging the **VLAN ID** to the port. When you tag the VLAN ID to the port, all packets associated with the port would be tagged with the corresponding VLAN. This enables the Summit WM Switch to directly connect to a VLAN network without the need to remove VLAN tags at the connection port.

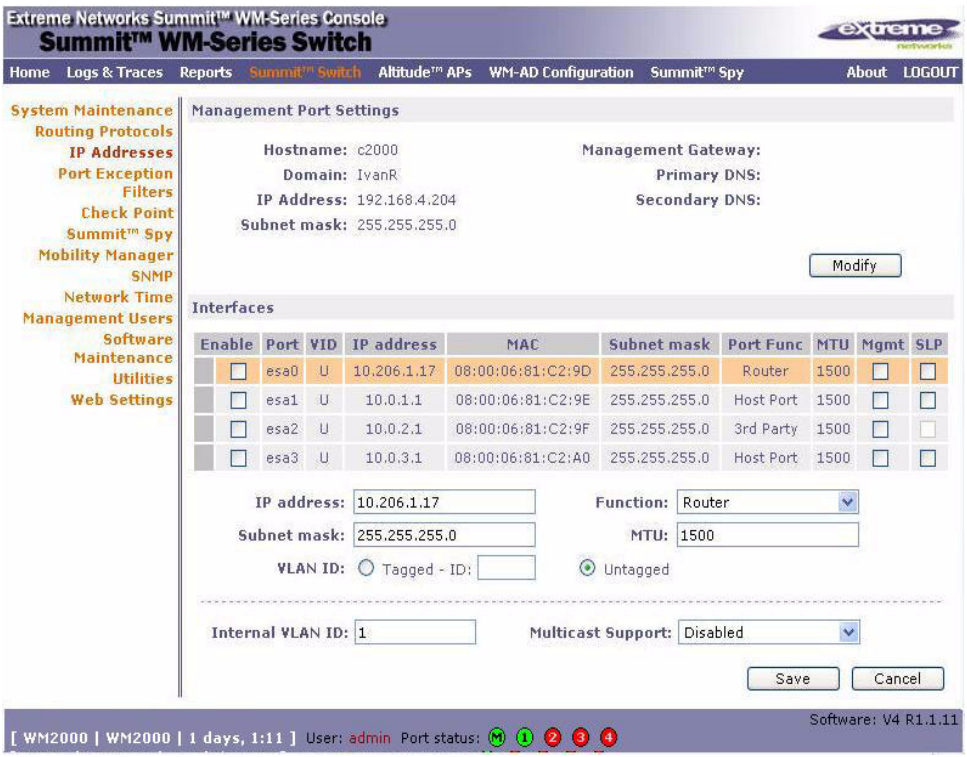
Note: Only the following models support VLAN:

- Summit Switch WM2000
- Summit Switch WM200

4.2 Configuring data ports

To configure the data port interfaces on the Summit WM Switch:

1. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.
2. In the left pane, click **IP Addresses**. The **Management Port Settings** screen is displayed.



The lower part of the screen displays the four ethernet ports, and each MAC address is displayed under the MAC column. The lowest part of the screen displays the text boxes for IP address, MAC address, Subnet mask and MTU. You can edit these values.

Note: The number of ports displayed on the **Management Port Settings** screen (on the GUI) reflects the number of physical ports the Summit WM Switch has. For example, the Summit Switches, WM2000, WM 200, and WM100 have four data ports, and hence the **Management Port Settings** screen will display four ports. The Summit Switch WM1000has two data ports, and therefore the **Management Port Settings** screen will display two ports

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3. To enable the port, select the checkbox under the **Enable** column.

Note: You must disable all the interfaces that are not in use in order to avoid routing loops.

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4. Type the following:
   - **IP address** – The IP address of the physical ethernet port.
   - **Subnet mask** – The subnet mask for the IP address, which separates the network portion from the host portion of the address (typically 255.255.255.0)
   - **MTU** – The maximum transmission unit or maximum packet size for this port. The default setting is 1500. If you change this setting, and are using OSPF, you must make sure that the MTU of each port in the OSPF link matches.

Note: The Summit WM Switch and Altitude AP are capable of participating in MTU discovery. During the MTU discovery process, the Summit WM Switch and Altitude AP automatically learn the correct MTU, and then correct their settings accordingly. If the routed connection to an Altitude AP travels a link that imposes a lower MTU than the configured MTU, the Summit WM Switch and Altitude AP will correct their MTU settings

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5. From the **Function** drop-down list, click one of the three functions.
   - **Host Port** – Specifies a port for connecting Altitude APs with no dynamic routing.
   - **Third-party AP Port** – Specifies a port to which the third-party AP is connected.
   - **Router Port** – Specifies a port that connects to an upstream, next-hop router in the network.
6. To enable management traffic on the port, select the **Mgmt** checkbox.

Enabling management provides access to the Summit Switch through the selected port using SNMP (”get” only), SSH and HTTPS management services.

7. To enable the SLP protocol, select the **SLP** checkbox.

   Selecting the **SLP** checkbox will enable the Summit WM Switch to advertise this port to the network for Altitude APs’ discovery.

8. Select either of the two VLAN options:

   - **Untagged**: Select **Untagged,** if you are not using VLAN.
   - **Tagged**: Select **Tagged**, and specify the VLAN ID in the **VLANID** text box, if you are using VLAN.

Note: The VLAN text boxes on the **Management Port Settings** screen are displayed only if you are using one of the following models:
• Summit Switch WM2000
• Summit Switch WM200

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9. To allow multicast support, click **Enabled** from the drop-down list.

   When you enable the multicast support, the interface is used for relaying multicast traffic between core and wireless devices. You must define only one port for the multicast traffic.

10. To save your changes, click **Save**.

11. Repeat Step 3 to Step 10 for every port that is to be enabled.

Now you must configure the routing on the Summit WM Switch. The following chapter describes how to configure the Summit WM Switch’s physical ports.

5 Routing configuration

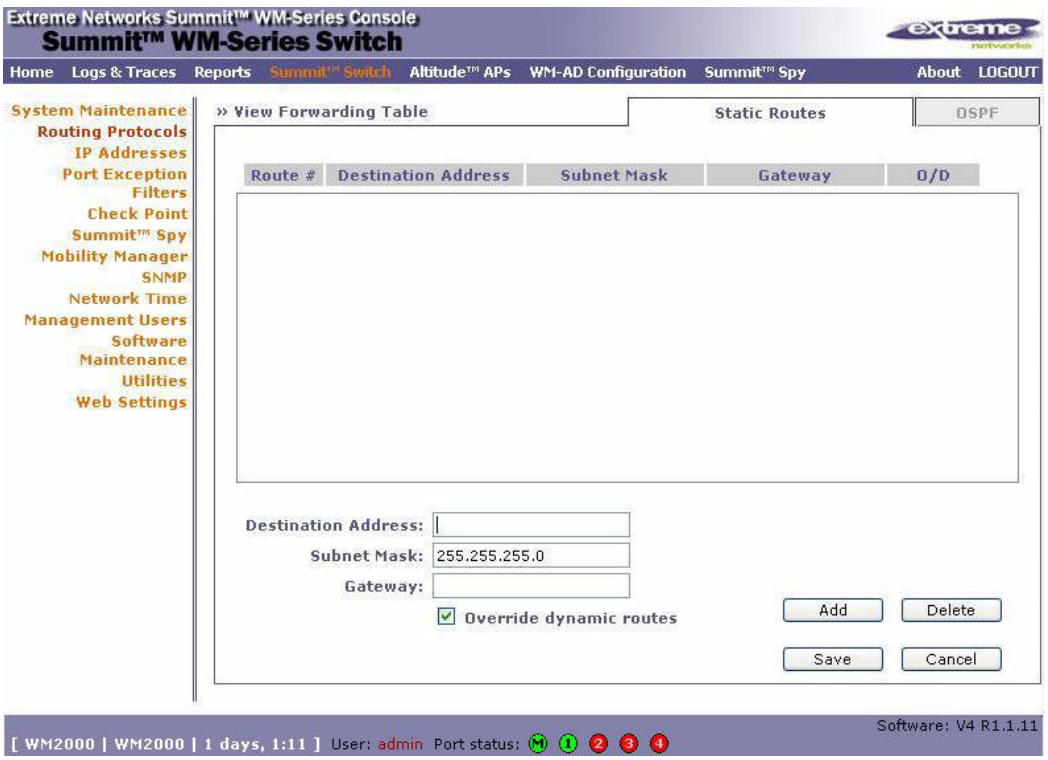
This chapter explains how to configure static routing and OSPF routing on the Summit WM Switch.

The topics in this chapter are organized as follows:

5.1 Configuring static routing

To configure a static route:

1. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.
2. In the left pane, click **Routing Protocols**. The **Routing Protocols** screen is displayed.



3. To add a new route, type the destination IP address of a packet in the **Destination Address** text box.

To define a default static route for any unknown address not in the routing table, type `0.0.0.0`. This is also called as defining the default gateway.

4. Type the appropriate subnet mask in the **Subnet Mask** text box to separate the network portion from the host portion of the IP address (typically 255.255.255.0).

   To define a default static route for any unknown address, type `0.0.0.0`.

5. Type the IP address of the specific router port or gateway that serves as the next-hop for the packets from Summit WM Switch (default gateway).

   This router port (or gateway) must be on the same subnet as the Summit WM Switch.

6. Click **Add**. The new route is added to the list of routes.

7. Select the **Override dynamic routes** check box to give priority over the OSPF routes that the Summit WM Switch uses for routing.

   By default, the **Override dynamic routes** is enabled. If you want to remove priority for static routes so that the routing is always controlled dynamically, clear the **Override dynamic routes** check box.

8. To save your changes, click **Save**.

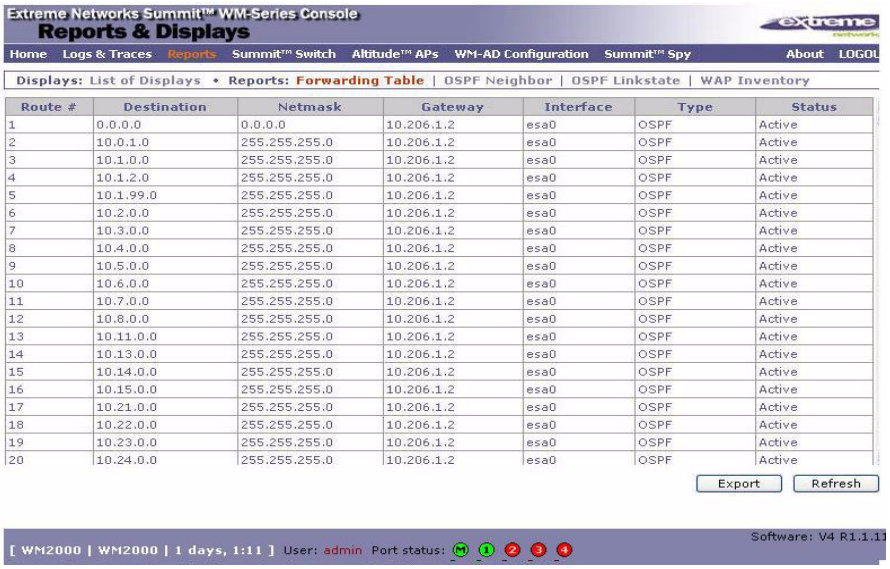
5.1.1 Viewing the forwarding table

You can view the defined routes, whether static or OSPF, and their current status in the forwarding table.

To view the forwarding table:

1. From the main menu, click **Reports & Displays**. The **Reports & Displays** screen is displayed.

2. Click **Forwarding Table**. The **Forwarding Table** is displayed.



3. To update the display, click **Refresh**.

5.2 Configuring the OSPF routing

To configure the OSPF routing, you must:

- Define one data port as a router port on the **IP addresses** screen.
- Enable OSPF globally on the Summit WM Switch. For more information, see Section 5.2.1, “Enabling OSPF globally on the Summit WM Switch”, on page 56.
- Define the global OSPF parameters. For more information, see Section 5.2.2, “Defining the global OSPF parameters”, on page 57.

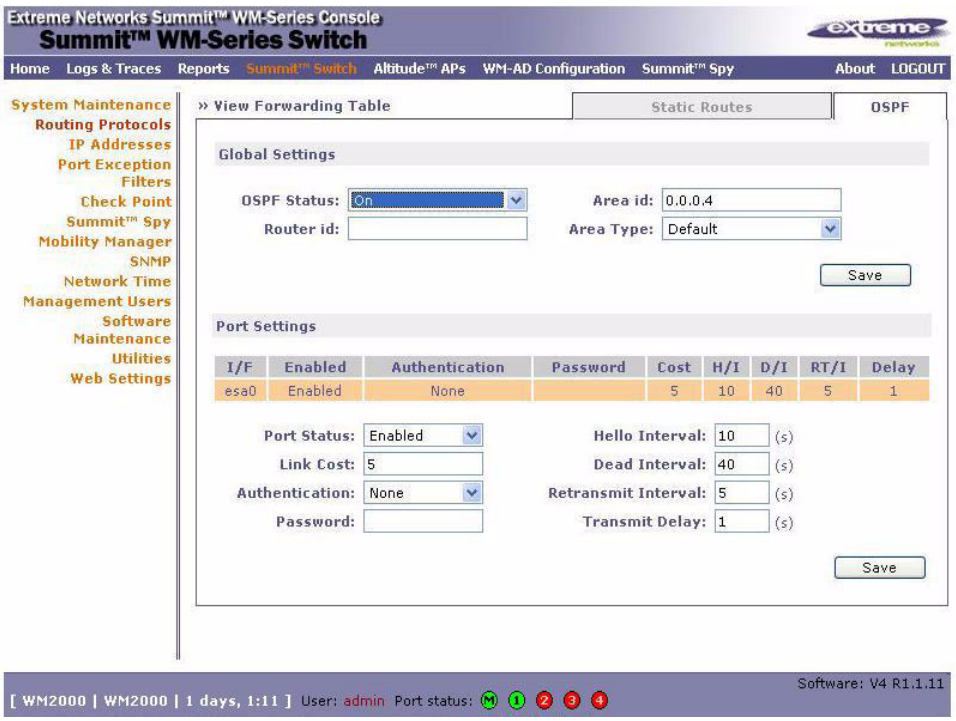
  Ensure that the OSPF parameters defined for the Summit WM Switch are consistent with the adjacent routers in the OSPF area. The consistency includes the following:

  - Timer Settings – If the peer router has different timer settings, the protocol timer settings in the Summit WM Switch must be changed to the peer router to match in order to achieve OSPF adjacency.
  - MTU – The MTU of the ports on either sides of the OSPF link must match. You must remember here that the MTU for ports is set to 1500 on the Summit WM Switch is when configuring the physical data ports on IP addresses’ screen. The value of 1500 matches the MTU in standard routers.

5.2.1 Enabling OSPF globally on the Summit WM Switch

To enable the OSPF globally on the Summit WM Switch:

1. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.
2. In the left pane, click **Routing Protocols**. The **Routing Protocols** screen is displayed.
3. Click the **OSPF** tab.



4. From the **OSPF Status** drop-down list, click **ON** to enable OSPF.
5. In the **Router ID** text box, type the IP address of the Summit WM Switch.

   The router ID must be unique across the OSPF area.

   If the **Router ID** text box is left blank, the IP address of one of the Summit WM Switch's interfaces will be picked as the router ID.
6. In the **Area ID** text box, type the area.

   The main area in OSPF depends upon your network configuration. You must find out the main area from your network administrator.
7. In the **Area Type** drop-down list, click one of the following:

- **Default** – Acts as the backbone area (also known as area zero). It forms the core of an OSPF network. All other areas are connected to it, and inter-area routing occurs via a router connected to the backbone area.
- **Stub** – Does not receive external routes. External routes are defined as routes, which are distributed in OSPF via another routing protocol. Therefore, the Stub area relies on a default route to send traffic routes outside the present domain.
- **Not-so-stubby** – A type of stub area that can import autonomous system (AS) external routes and send them to the default/backbone area, but can not receive AS external routes from the backbone or other areas.

8. To save your changes, click **Save**.

5.2.2 Defining the global OSPF parameters

To define the global OSPF parameters:

1. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.
2. In the left pane, click **Routing Protocols**. The **Routing Protocols** screen is displayed.
3. Click the **OSPF** tab.
4. From the **Port Status** drop-down list, click **Enabled**. The OSPF is enabled on the port.

Note: Only the interfaces defined as router type are available for OSPF neighborhood establishment.

---

5. In the **Link Cost** text box, type the OSPF standard for your network for this port.

   The **Link Cost** is the cost of sending a data packet on the interface. The lower the cost, the more likely the interface will be used to forward the data traffic.

Note: If more than one port is enabled for OSPF, you must prevent the Summit WM Switch from serving as a router for the other traffic. In order to do this, you must set the **Link Cost** to its maximum value of 65535.

---

6. From the **Authentication** drop-down list, click the authentication type of OSPF on your network:
   - **None**: The default is **None**. If **None** is selected, leave the **Password** text box blank.

- **Password**: If **Password** is selected, type the password in the **Password** text box in the.

7. Type the values in the following text boxes.
   - **Hello-Interval** – Specifies the time in seconds (displays OSPF default). The default setting is 10.
   - **Dead-Interval** – Specifies the time in seconds (displays OSPF default). The default setting is 40.
   - **Retransmit-Interval** – Specifies the time in seconds (displays OSPF default). The default setting is 5.
   - **Transmit Delay** – Specifies the time in seconds (displays OSPF default). The default setting is 1.
8. To save your changes, click **Save**.

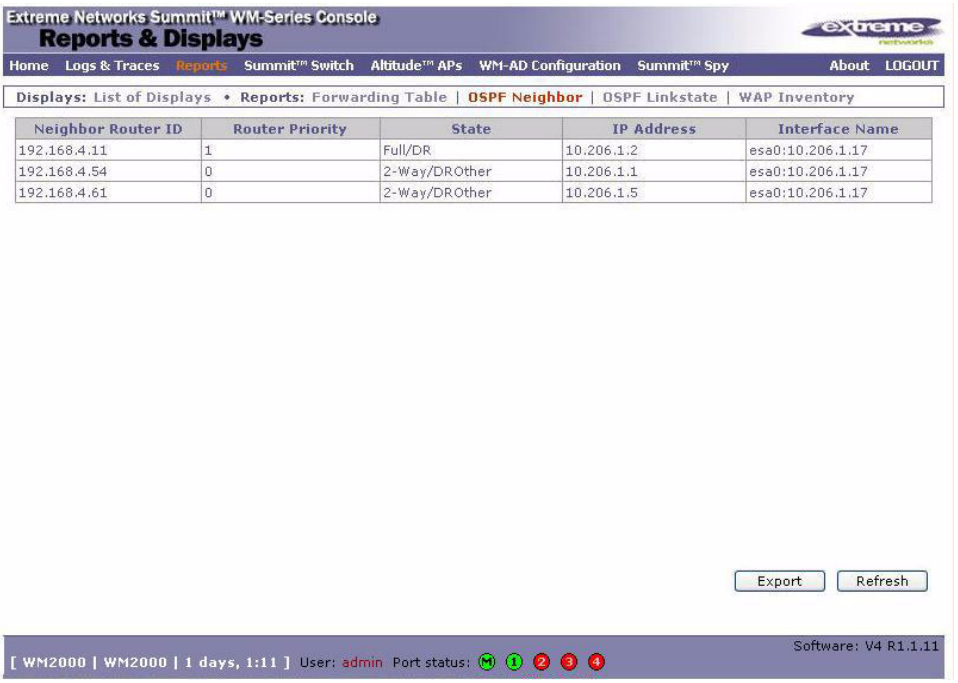
Now you must confirm that the ports are set for OSPF.

5.2.2.1 Confirming the ports are set for OSPF

To confirm the ports are set for OSPF:

1. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.
2. On the **Routing Protocols** screen, click **View Forwarding Table**. The **Forwarding Table** is displayed.
3. Click the **OSPF Neighbor** tab.

   If OSPF protocol is enabled, this report displays the current neighbors for OSPF.



4. Click the **OSPF Linkstate** tab.

   If OSPF protocol is enabled, the report displays the link state advertisement (LSAs) received by the running OSPF protocol.

5. To update the screen, click **Refresh**.

Now you must configure the DHCP, DNS and RADIUS servers on the network.

The following chapter explains how to configure DHCP, DNS and IAS services on Windows 2003 Server.

6 Configuring DHCP, DNS and IAS services

This chapter describes how to configure DHCP, DNS and IAS services on Windows 2003 Server. In addition, the chapter explains how to configure DHCP service on a Linux-based server.

Note that your Windows 2003 or Linux server may have a different configuration process than what is described here. You must refer to your manufacturer's document to know the configuration process that is specific to your server.

The configuration processes described in this chapter should be used as examples.

The topics in this chapter are organized as follows:

6.1 DHCP service configuration

Before you can configure the DHCP service, you must install it on the server. DHCP is not installed by default during a typical installation of Windows Standard Server 2003 or Windows Enterprise Server 2003. You can install DHCP either during the initial installation of Windows Server 2003 or after the initial installation is completed.

You must also install **078 SLP DA Option**. The **078 SLP DA Option** is not installed by default during a typical installation of DHCP service.

You may visit http://support.microsoft.com to learn how to install DHCP and 078 SLP DA Option on Windows 2003.

The following section describes how to configure DHCP for Summit WM-Series WLAN Switch Software Solution.

6.1.1 Configuring DHCP in Windows 2003 Server

You must also enable **078 SLP DA Option** for every scope you define. A scope is a collection of IP addresses meant to be distributed by the DHCP server to the client devices on a subnet.

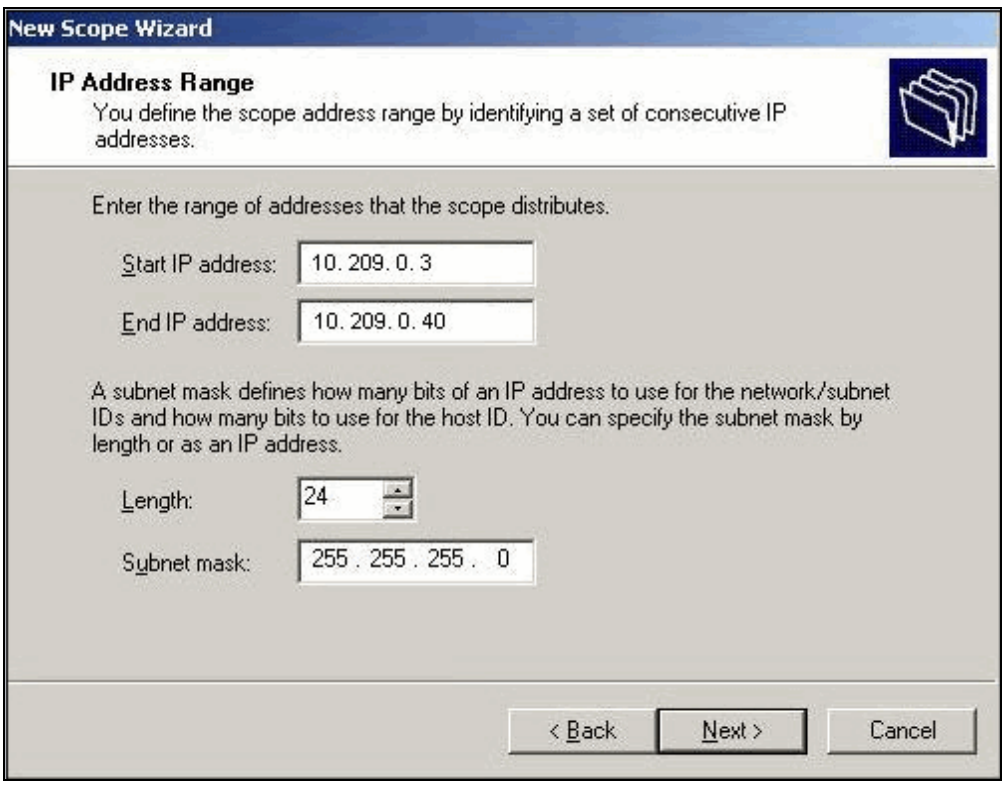
The SLP DA is used by:

- The Altitude APs to discover the Summit WM Switch.
- The mobility agents to discover the mobility manager.

To configure DHCP in Window 2003 Server:

1. Click **Start**, point to **Administrative Tool**, and then click **DHCP**.
2. In the console tree, right-click the DHCP server on which you want to create the new DHCP scope, and then click **New Scope**.
3. Click **Next**. The **Scope Name** window is displayed.
4. In the **Name** and **Description** text boxes, type the scope's name and the description respectively.

   This can be any name that you want, but it should be descriptive enough so that you can identify the purpose of the scope on your network.
5. Click **Next**. The **IP Address Range** window is displayed.



6. In the **Start IP address** and the **End IP address** text boxes, type the start and end of the IP addresses' range that you want to be distributed to the network.

   Range – Is the range of addresses that the scope will distribute across the network. You must use the range provided by your network administrator.
7. In the **Length** text box, type the numeric value of the subnet mask's bits; or in the **Subnet mask** text box, type the subnet mask's IP address.

A subnet mask defines how many bits of an IP address to use for the network/subnet IDs and how many bits to use for the host ID. You can specify the subnet mask by length or as an IP address. You must use the **Length** (or the **Subnet mask**) provided by your network administrator.

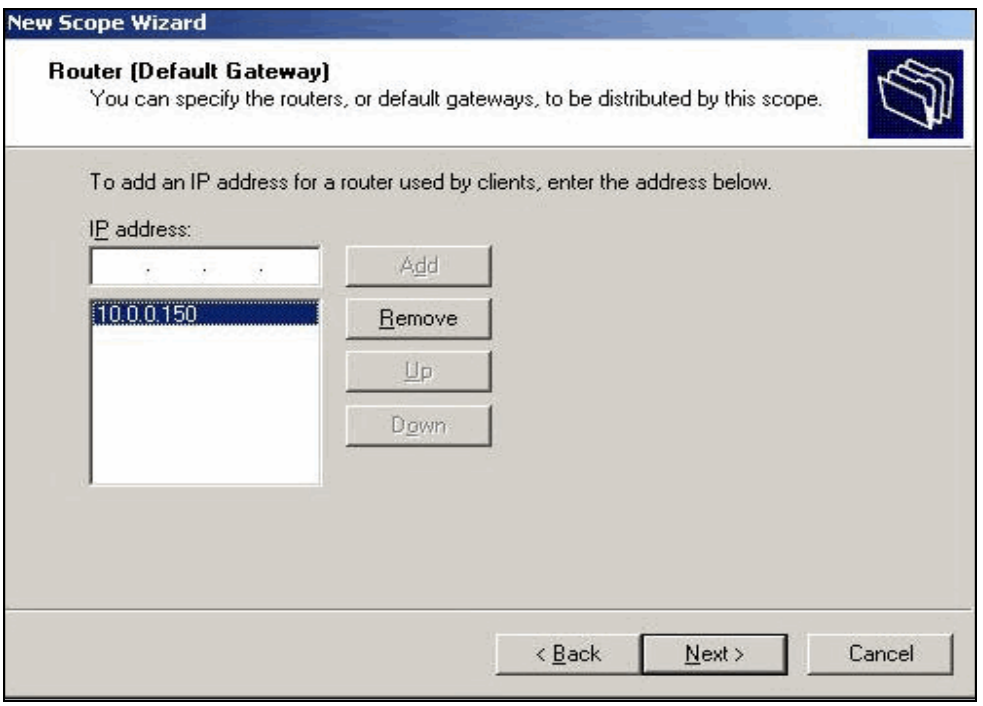
8. Click **Next**. The **Add Exclusions** window is displayed.
9. In the **Start IP address** and the **End IP address** text boxes, type the start and end of the IP addresses' range that you want to exclude from the distribution.

   You must use the exclusion range provided by your network administrator.
10. Click **Next**. The **Lease Duration** window is displayed.

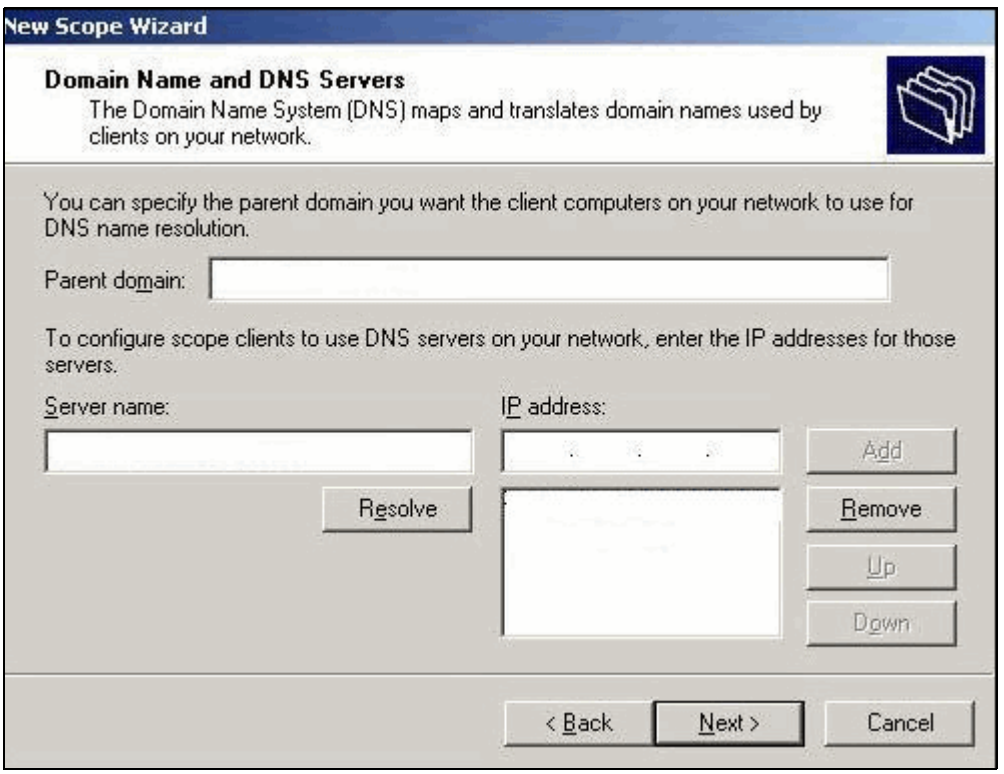
    The DHCP server assigns a client an IP address for a given amount of time. The amount of time for which the IP address can be leased is defined in the **Lease Duration** window.
11. In the **Days**, **Hours and Minutes** text box, type the lease duration.

    You must use the **Lease Duration** as specified by your network administrator.
12. Click **Next**. The **Configure DHCP Options** window is displayed.
13. Select **Yes, I want to configure these options now**, and then click **Next**. The **Router (Default Gateway)** window is displayed.
14. In the **IP address** text box, type the network's default gateway.

    You must use the default gateway provided by your network administrator.



15. Click **Next**. The **Domain Name and DNS Servers** window is displayed.



16. In the **Parent domain** text box, type your company's domain name.

    You must use the **Parent Domain** provided by your network administrator.

17. In the **Server name** text box, type your server name.

    You must use the **Server name** provided by your network administrator.

18. In the **IP address** text box, type your server's IP address, and click **Add**.
19. Click **Next**. The **WINS Servers** window is displayed.
20. Click **Next**. The **Activate Scope** window is displayed.
21. Select **Yes, I want to activate this scope now**, and click **Next**. The wizard displays the following message: **This server is now a DHCP server**.
22. Click **Start**, point to **Administrative Tool**, and then click **DHCP**. The DHCP console tree is displayed.
23. Select the scope you configured, and right-click.
24. Select **Configure Options**. The **Server Options** window is displayed.
25. Enable **078 SLP DA**.

26. In the lower pane of the screen, type the hexadecimal values of the SLP DA's IP address.

Note:
- The Altitude APs use the SLP DA to discover the Summit WM Switch.
- The mobility agents use the SLP DA to discover the mobility manager.

Note: here is no SLP deployment on the enterprise network, the Summit WM Switch is configured to act as a DA by default. If you put the Summit WM Switch's IP address(es) in a DHCP server for Option 78, Altitude APs will interact with the Summit WM Switch for discovery.
Similarly, the mobility agents will also interact with the Summit WM Switch to discover the mobility manager.

27. Click **Apply,** and then click **OK**.

6.1.2 Configuring DHCP in Red Hat Linux Server

You can configure a DHCP server using the configuration file `/etc/dhcpd.conf`.

DHCP also uses the file `/var/lib/dhcp/dhcpd.leases` to store the client lease database.

The first step in configuring a DHCP server is to create the configuration file that stores the network information for the clients. Global options can be declared for all clients, or options can be declared for each client system.

The configuration file can contain any extra tabs or blank lines for easier formatting. The keywords are not case-sensitive and lines beginning with a hash mark (#) are considered comments.

To use the recommended mode, add the following line to the top of the configuration file:

```
ddns-update-style interim;
```

Read the `dhcpd.conf` man page for details about the different modes.

There are two types of statements in the configuration file:

- Parameters – State how to perform a task, whether to perform a task or what networking configuration options to use to send to the client.
- Declarations – Describe the topology of the network, describe the clients, provide addresses for the clients, or apply a group of parameters to a group of declarations.

Some parameters must start with the option keyword and are referred to as options. Options configure DHCP options; whereas, parameters configure values that are not optional or control how the DHCP server behaves.

Parameters (including options) declared before a section enclosed in curly brackets {} are considered global parameters. Global parameters apply to all the sections below it.

Note: If you change the configuration file, the changes will not take effect until you restart the DHCP daemon with the command `service dhcpd restart`.

The following is the example of DHCP configuration on a Red Hat Linux Server.

For Altitude AP subnet

```
subnet 10.209.0.0 netmask 255.255.255.0 {
       option routers 10.209.0.2; ### This is the network's default
       gateway address.
       option subnet-mask 255.255.255.0
       option domain-name xyznetworks.ca
       option domain-name servers 192.168.1.3, 207.236, 176.11
       range 10.209.0.3 10.209.0.40;
       default-lease-time 7200000 ###The figures are in seconds.
       option slp-directory-agent true 10.209.0.1, 10.209.0.3;
       ####The Altitude APs use the SLP DA to discover the Summit WM
       Switch, and the mobility agents use it to discover the mobil-
       ity manager.
       authoritative;
```

For WM-AD subnets (In Summit WM Switch it is configured as Use DHCP Relay)

if you are utilizing multiple WM-ADs you must configure the Red Hat Linux server for every WM-AD.

The following is the example of DHCP configuration in Red Hat Linux for two WM-ADs (For more information, see Chapter 8, "WM-AD configuration").

```
subnet 172.29.31.0 netmask 255.255.255.224
      option routers 172.29.31.1; #### This is the WM-AD 1 gateway.
      option subnet-mask 255. 255. 255.0
      option domain-name toronto.xyznetworks.com";
      option domain-name-servers 192.1.1.3;
      range 172.29.31.2 172.29.31.30;
      default-lease-time 36000;
      max-lease-time 7200000;###The figures are in seconds.
      authoritative;
}
```

```
subnet 172.29.2.0 netmask 255.255.255.224
      option routers 172.29.2.1; #### This is the WM-AD 2 gateway.
      option subnet-mask 255. 255. 255.0
      option domain-name toronto.xyznetworks.com";
      option domain-name-servers 192.1.1.3;
      range 172.29.2.2 172.29.2.30;
      default-lease-time 36000;
      max-lease-time 7200000;###The figures are in seconds.
      authoritative;
}
```

6.2 IAS service configuration

Microsoft Internet Authentication Service (IAS) can run as a Remote Authentication Dial-in User Service (RADIUS) server. You can use IAS for centralized authentication and accounting of multiple client devices.

IAS configuration involves the following steps:

- Step 1 – Installing IAS on Windows 2003 Server
- Step 2 – Enabling IAS to authenticate users in active directory
- Step 3 – Configuring IAS properties
- Step 4 – Configuring Summit WM Switch as IAS client
- Step 5– Configuring Remote Access Policies

6.2.1 Installing IAS on Windows 2003 Server

You must install IAS on Windows 2003 Server according to the documentation provided with the server. You may also visit http://support.microsoft.com to learn how to install IAS on Windows 2003.

6.2.2 Enabling IAS to authenticate users in active directory

To enable IAS to authenticate users in active directory:

1. Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Internet Authentication Service**.
2. In the **Action** menu, click **Register Service in Active Directory**.
3. To confirm the IAS registration in the local domain, click **OK**.

6.2.3 Configuring IAS properties

To configure the IAS properties:

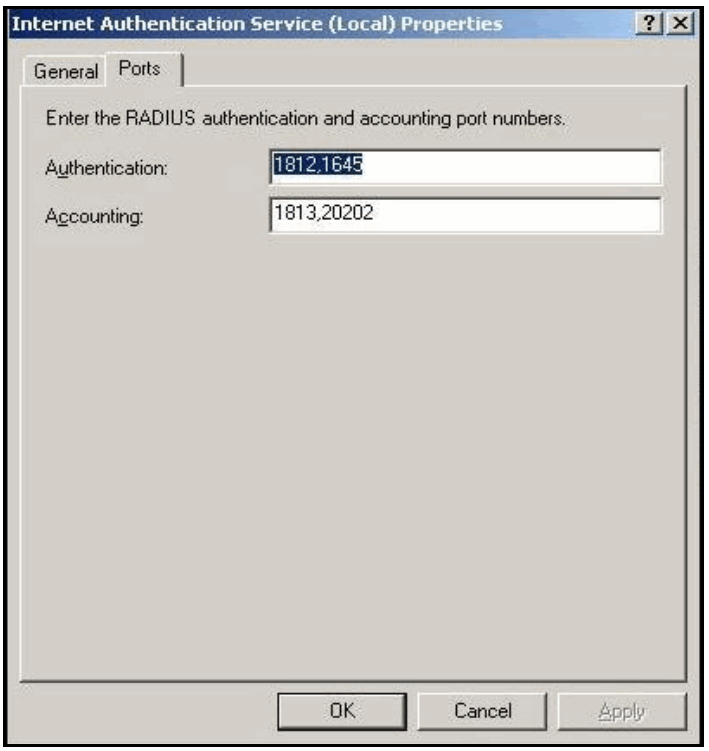
1. Click **Start**, point to **Programs**, point to **Administrative Tools**, and then click **Internet Authentication Service**.
2. Right-click **Internet Authentication Service (Local)**, and then click **Properties**.
3. In the **Description** text box, type a name that you want to assign to this IAS server.
4. If you do not want to record the rejected authentication requests, clear the **Log rejected or discarded authentication requests** checkbox.

   Note: You can use the log file to determine if unauthorized users are attempting to authenticate themselves in the domain.

5. If you do not want to record the successful authentication requests, clear the **Log successful authentication requests** checkbox.

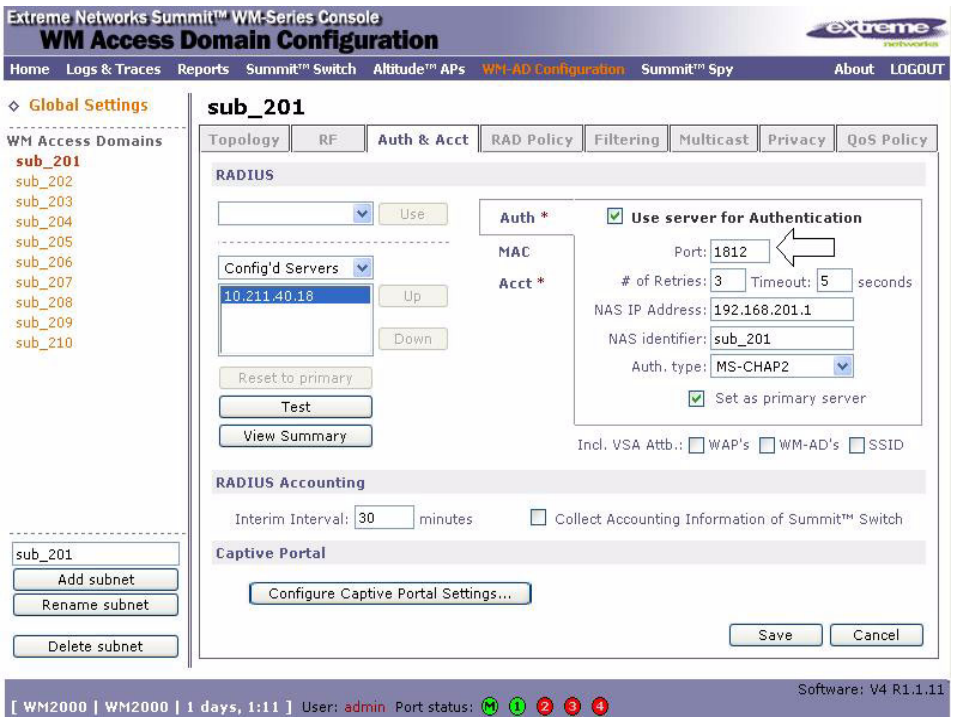
   Note: You can use the log file to determine the usage patterns of wireless users.

6. Click the **Ports** tab.



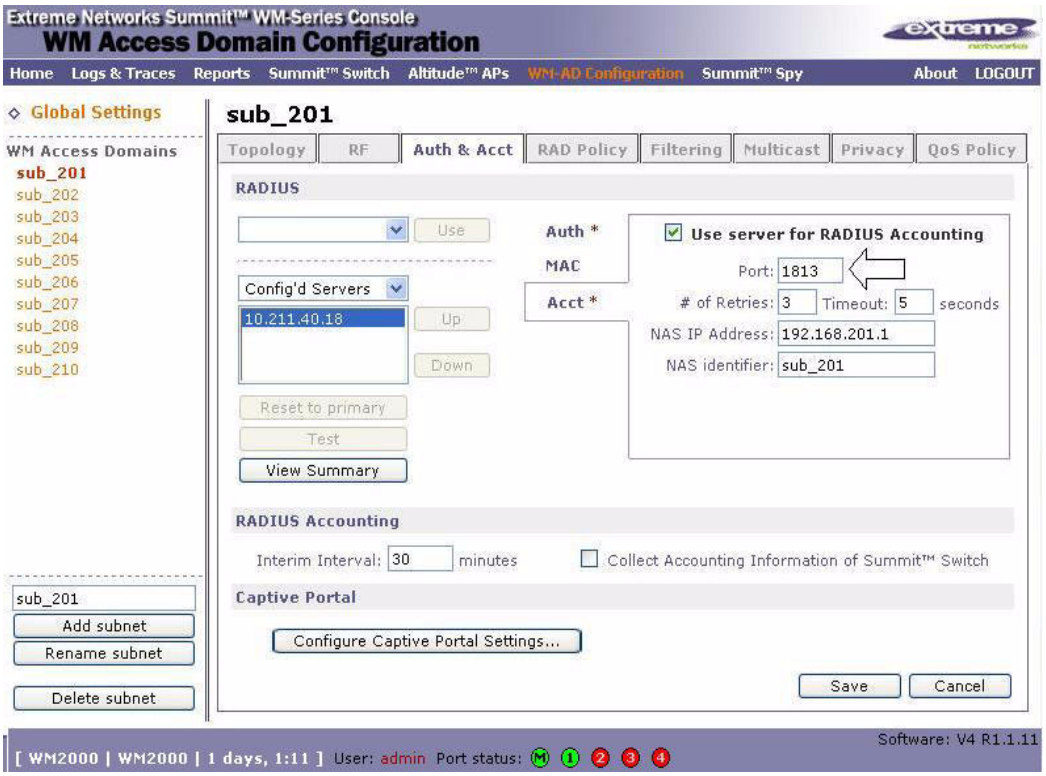
7. In the **Authentication** text box, type the Summit WM Switch's port # that is used to access the authentication (IAS) service.
8. In the **Accounting** text box, type the Summit WM Switch's port # that is used to access the accounting service.

   You must note that the values you type in the **Authentication** text box should match the value that you define in the **Port** text box of **Auth** section on the **Auth & Acct** tab of Summit WM Switch's WM-AD screen. For more information, see Section 8.5, "Configuring authentication mechanism for WM-AD" of Chapter 8, "WM-AD configuration".



Similarly, the values you type in the **Accounting** text box, should match the value that you define in the **Port** text box of **Acct** section in the **Acc & Acct** tab of Summit WM Switch's WM-AD screen.For more information, see Section 8.5, "Configuring authentication mechanism for WM-AD" of Chapter 8, "WM-AD configuration".

6.2.4 Configuring Summit WM Switch as IAS client



To configure Summit WM Switch as IAS client:

1. Click **Start**, point to **Administrative Tool**, and then click **Internet Authentication Service**.
2. Right-click **Clients**, and then **New Client**.
3. In the **Friendly name** text box, type the name that you want to assign to the Summit WM Switch, and then click **Next**.
4. In the **Client address** (**IP or DNS**) text box, type the IP address of the Summit WM Switch, and then click **Verify**.
5. Click **Resolve**. If the IP address is correct, it appears in the **Search results** text box.
6. Click **Use this IP**.
7. In the **Client-Vendor** list, click **RADIUS Standard**.

8. In the **Shared secret** text box, type a password that both the IAS server and the Summit WM Switch will use to mutually authenticate.

Note: This password is case-sensitive. You can use alphanumeric characters as well as special characters. The password must be between 16 and 24 characters in length. You must configure the **shared secret password** in Summit WM Switch. For more information, see Section 8.5.1.2, “Configuring external Captive Portal authentication”, on page 108.

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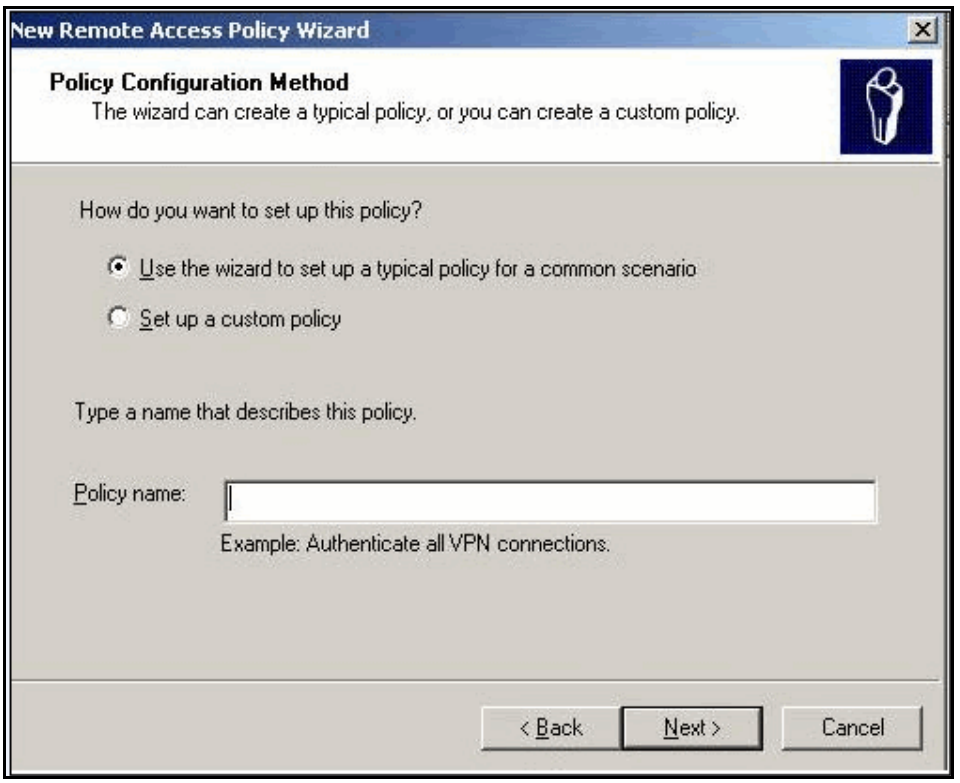
9. Retype the password in the **Confirm shared secret** box, and then click **Finish**.

6.2.5 Configuring Remote Access Policies

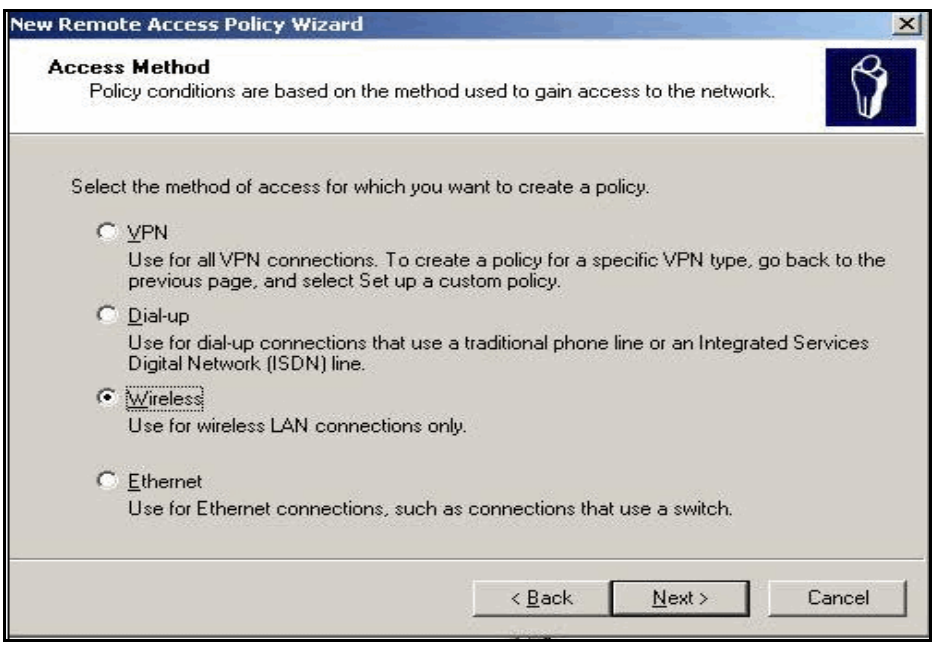
To configure Remote Access Policy:

1. Click **Start**, point to **Administrative Tool**, and then click **Internet Authentication Service**.
2. Click **Remote Access Policies**.
3. In the right pane of the **Internet Authentication Service**, click **Allow access if dial-in permission is enabled**, and then right-click **Allow access if dial-in permission is enabled**.
4. Click **Delete**. A dialogue box is displayed.
5. Click **Yes** on the dialogue box.
6. On the **Action** menu, click **New Remote Access Policy**. The **New Remote Access Policy Wizard** is displayed.

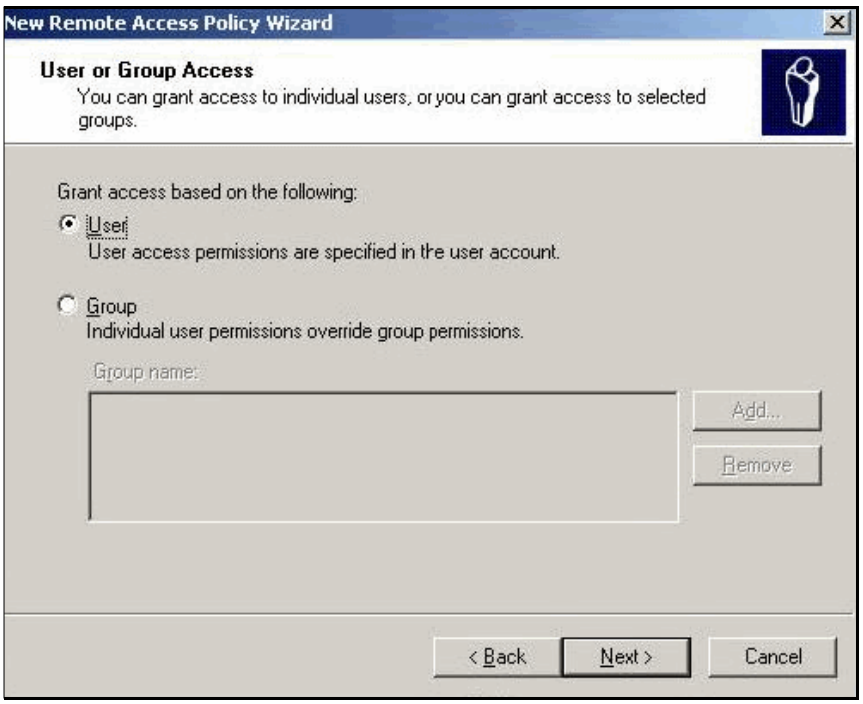
7. Click **Next**. The **Policy Configuration Method** window is displayed.



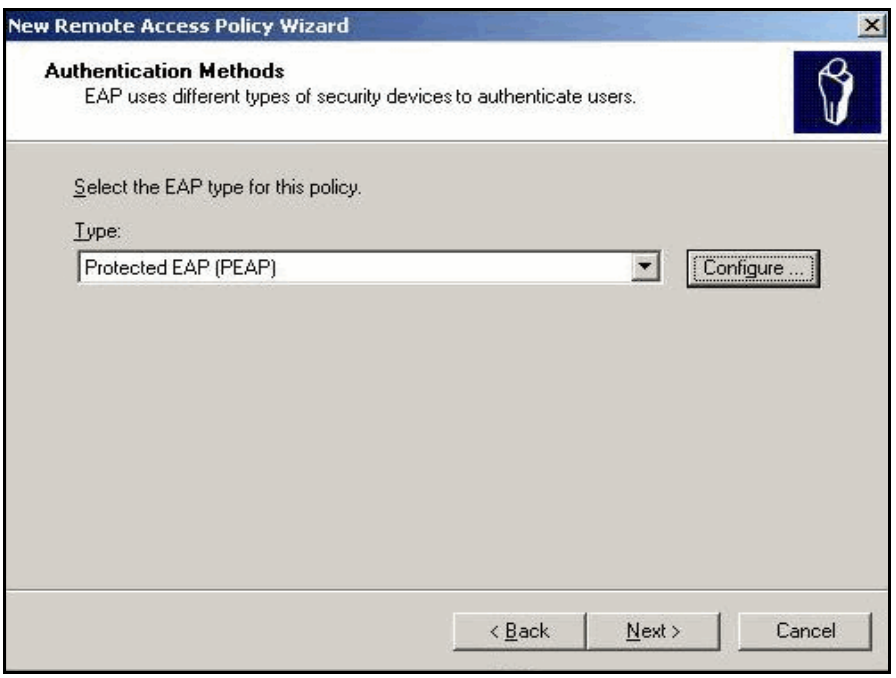
8. Select **Use the wizard to set up a typical policy for a common scenario**.
9. In the **Policy name** text box, type the name you want to assign to the policy, and then click **Next**. The **Access Method** window is displayed.



10. Select **Wireless** and then click **Next**. The **User or Group Access** window is displayed.



11. Select **User** or **Group**, and click **Next**. The **Authentication Methods** window is displayed.



12. Select **Protected EAP (PEAP)** or **Smart card or other certificate**, and click **Next**.
13. Click **Finish**. The new policy is displayed in the right pane.
14. In the right pane, select and right-click the newly configured remote access policy.
15. Select **Properties**. The **Properties** window is displayed.
16. Select **Grant Remote Access Permission**.
17. Click **Apply** and then click **OK**.
18. Click **Add**. The **Attributes** window is displayed.
19. Select **IP address**. The **Client IP-Address** window is displayed.
20. In the **Client IP-Address** window, type the Summit WM Switch's IP address.
21. Click **OK**.

6.3 DNS service configuration

The domain name system (DNS) stores and associates many types of information with domain names, but most importantly, it translates domain names (computer hostnames) to IP addresses.

You must install DNS on Windows 2003 Server according to the documents provided with the server. Visit http://support.microsoft.com to learn how to install DNS on Windows 2003.

The DNS configuration involves two steps:

- Step 1 – Configuring the DNS for internet access
- Step 2 – Configuring DNS for Altitude APs discovery.

6.3.1 Configuring DNS for internet access

To configure DNS for internet access:

1. Click **Start**, point to **All Programs**, point to **Administrative Tools**, and then click **Configure Your Server Wizard**.
2. Click **Next**. The **Summary of Selections** window is displayed.

Note: The Summary of Selections window should list the following two items: **Install DNS** and **Run the Configure a DNS Wizard to configure DNS**.
If the Summary of Selections window does not list these two items, you must:
• Click **Back** to return to **DNS Server Roles** window.
• Click **DNS**.
• Click **Next**.

---

3. In the **Summary of Selections** window, click **Next**. The **Select Configuration Action** window is displayed.

   When the **Configure Your Server** wizard installs the DNS service, it first determines whether the IP address for this server is static or the server is configured to secure it automatically.

   If your server is currently configured to obtain its IP address, the wizard prompts you to configure the server with a static IP address instead of displaying the **Select Configuration Action** window.

To configure the server with a static IP address:

   a) In the **Local Area Connection Properties**, click **Internet Protocol** (TCP/IP), and then click **Properties**. The **Internet Protocol (TCP/IP) Properties** window is displayed.

   b) In the **Internet Protocol (TCP/IP) Properties** window, click **Use the following IP address**.

   c) In the **Static IP address**, **Subnet mask**, and the **Default gateway** text boxes, type the static IP address, the subnet mask and the IP address of the default gateway respectively.

   d) In the **Preferred DNS** text box, type the IP address of the server.

   e) In the **Alternate DNS** text box, type the IP address of another internal DNS server.

   The **Alternate DNS** text box is optional.

   f) Click **OK**, and then click **Close**.

4. In the **Select Configuration Action** window, select the **Create a forward lookup zone** checkbox, and then click **Next**. The **Primary Server Location** window is displayed.

5. In the **Primary Server Location** window, select **This server maintains the zone**, and then click **Next**. The **Zone name** window is displayed.
6. In the **Zone name** text box, type the name of the **DNS zone for your network**, and then click **Next**. The **Dynamic Update** window is displayed.

   The zone name is identical to the DNS domain for small organization or branch office.
7. In the **Dynamic Update** window, click **Allow both nonsecure and secure dynamic updates**, and then click **Next**. The **Forwarders** window is displayed.
8. In the **Forwarders** window, click **Yes, it should forward queries to DNS servers with the following IP addresses**.

   When you select this feature, all DNS queries for DNS names are forwarded to a DNS at either your ISP or central office.
9. In the **IP addresses** text box, type one or more IP addresses that either your ISP or central office DNS servers use, and click **Next**.
10. Click **Finish**. The wizard displays the following message: **This server is Now a DNS Server**.

6.3.2 Configuring DNS for Altitude APs discovery

To configure DNS for Altitude APs discovery:

1. Click **Start**, point to **All Programs**, point to **Administrative Tools**, and then click **DNS**.
2. Select the domain.
3. In the **Action** menu, select **New Domain**. The **New DNS Domain** window is displayed.
4. In the **New DNS Domain** window, type the name for the new domain.
5. Restart the service. The new domain is displayed as the child domain.

6. Right-click the new domain name, and select **New Host**. The **New Host** window is displayed.

7. In the **Name** text box, type the Summit WM Switch's name.
8. In the **IP address** text box, type the Summit WM Switch's IP address.
9. Select **Create associated pointer (PTR) record** checkbox.
10. Click **Add Host**. The new host is displayed in the right pane of the screen.
11. Quit DNS.

Now you must configure the Altitude APs via the Summit WM Switch.

7 Altitude AP's configuration

This chapter describes how to configure and manage the Altitude APs.

The topics in this chapter are organized as follows:

7.1 Altitude AP overview

Altitude APs bridge network traffic between wireless devices and the Ethernet LAN.

The Altitude APs, by default, do not have a graphical user interface (GUI); they are configured and managed by the Extreme Networks Summit WM-Series Console. In addition, you can centrally manage (verify and upgrade) the Altitude AP firmware image via the Extreme Networks Summit WM-Series Console.

All communication with the Summit WM Switch is carried out using a UDP-based protocol. The protocol encapsulates the IP traffic from the Altitude AP and directs it to the Summit WM Switch. The Summit WM Switch decapsulates the packets and routes them to the appropriate destinations while managing sessions and applying policy.

The Altitude APs are available in two models:

- **Altitude AP 350-2** – Integrated Antenna Access Point
- **Altitude AP 350-2** – Detachable Antenna Access Point

The Altitude APs have two radios:

- 2.4 GHz radio supporting the 802.11b/g standards
- 5 GHz radio supporting the 802.11a standard

The radios on the Altitude APs are enabled or disabled through the Extreme Networks Summit WM-Series Console. For more information, see the Chapter 5 – Configuring the Altitude AP of *Summit WM-Series WLAN Switch Software WM2000 User Guide*.

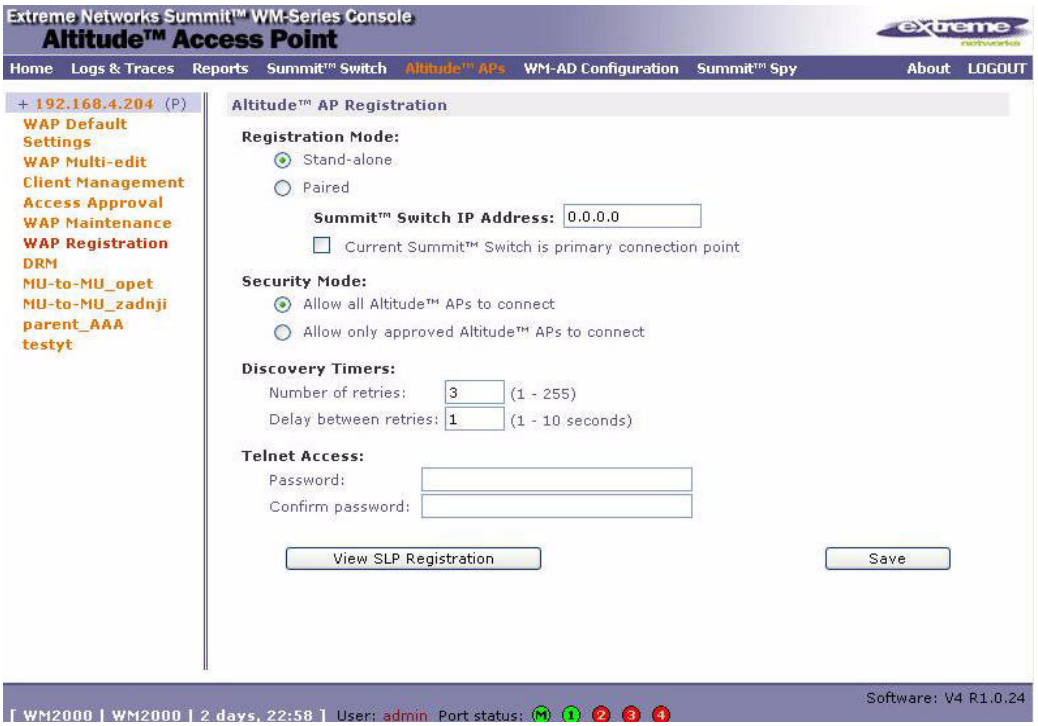
7.2 Configuring the Altitude APs for the first time

Before you start configuring the Altitude APs, ensure that you have:

- Set-up, installed and configured the Summit WM Switch.
- Installed the Altitude APs at the location indicated by your site survey.

To configure the Altitude APs for the first time:

1. From the main menu, click **Altitude AP Configuration**. The **Altitude AP** screen is displayed.
2. In the left pane, click **WAP Registration**.



3. In the **Security Mode** section, select one of the following options:

Note: Security mode is a Summit WM Switch property. It defines how the Summit WM Switch behaves when registering new devices. During the registration process, the Summit WM Switch's approval of the Altitude APs depends on the security mode that has been set.

- **Allow all WAPs to connect**:
  - If the Summit WM Switch does not recognize the registering serial number, a new registration record is automatically created for the Altitude AP. The Altitude AP receives a default configuration.

- If the Summit WM Switch recognizes the serial number, it indicates that the registering device is pre-registered with the Summit WM Switch. The Summit WM Switch uses the existing registration record, and existing configuration record to authenticate and configure the Altitude AP respectively.

- **Allow only approved Altitude APs to connect**:

  - If the Summit WM Switch does not recognize the Altitude AP, the Altitude AP's registration record is created in pending state. You must manually approve a pending Altitude AP. As long as the Altitude AP is in pending state, it receives minimum configuration that only allows it to maintain an active link with the Summit WM Switch for future state change. For more information, see Section 7.2.1, "Manually approving pending Altitude APs".

  - If the Summit WM Switch recognizes the serial number, it uses the existing registration record to authenticate the Altitude AP. Following the successful authentication, the Altitude AP is configured according to its stored configuration record.

4. In the **Discovery Timers** section, type the discovery timer values in the following text boxes:

   - **Number of retries** – Limited to 255 in a five minute discovery period. The default value is 2.

   - **Default between retries** – The default value is 1 second.

5. To save your changes, click **Save**.

6. To initiate the discovery and registration process, connect the Altitude AP to a power source.

   The Altitude APs can be connected and powered in the following ways:

   - Power over Ethernet (802.3af):

     - PoE enabled with port

     - PoE Injector

   - Power by AC adaptor

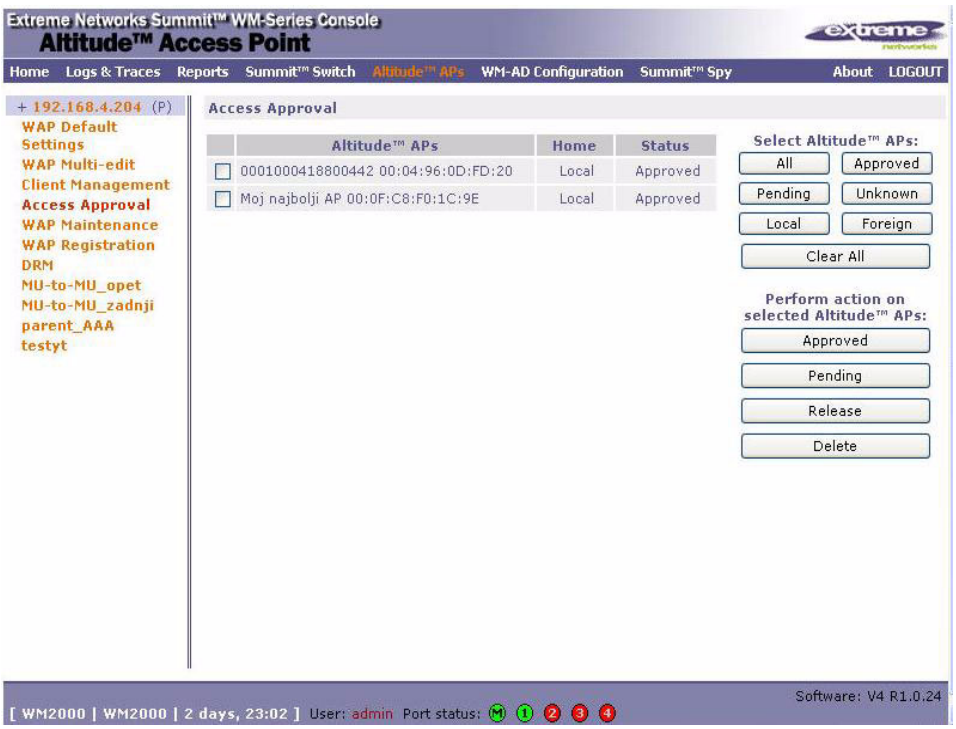
   For more information, see the *Altitude AP Installation Guide*.

7.2.1 Manually approving pending Altitude APs

If the Summit WM Switch does not recognize the Altitude AP, the Altitude AP's registration record is created in pending state. You must manually approve a pending Altitude AP. As long as the Altitude AP is in pending state, it receives minimum configuration that only allows it to maintain an active link with the Summit WM Switch for future state change.

To manually approve pending Altitude APs:

1. From the main menu, click **Altitude AP Configuration**. The **Altitude AP** screen is displayed
2. In the left pane, click **Access Approval**. The **Access Approval** screen is displayed.



3. In the **Select Altitude APs** section, click **Pending**. The pending Altitude APs are selected.
4. In the **Perform action on selected Altitude APs**, click **Approved**. The state of the selected Altitude APs is changed from "Pending" to "Approved".

7.3 Assigning names to Altitude APs

After the Altitude APs are successfully registered, you can assign them appropriate names.

To assign a name to a Altitude AP:

1. From the main menu, click **Altitude AP Configuration**. The **Altitude AP** screen is displayed.
2. In the **Altitude AP** list, click the **Altitude AP** for which you want to assign a name. The **WAP Properties** tab is displayed.
3. In the **Name** text box, type the name that you want to assign to the selected Altitude AP.
4. To save your changes, click **Save**.

Note: You can modify the Altitude AP's properties that are displayed in the right pane of the **Altitude AP** screen. For more information, see Section 7.4, "Modifying Altitude APs' properties".

7.4 Modifying Altitude APs' properties

After the Altitude APs are successfully registered, you can modify their properties.

To assign a name to a Altitude AP:

1. From the main menu, click **Altitude AP Configuration**. The **Altitude AP** screen is displayed.
2. In the **Altitude AP** list, click the **Altitude AP** for which you want to modify the properties. The **WAP Properties** tab is displayed.

   The WAP Properties displays the following properties:

   - **Name** – By default, this text box contains the serial number of the Altitude AP.
   - **Description** – Short description of the Altitude AP.
   - **Port** # – Summit WM Switch's ethernet port to which the Altitude AP is connected.
   - **Poll Timeout** – The timeout value for polling the Summit WM Switch. The value is in seconds. The default value is 10 seconds.
   - **Poll Interval** – The time interval during which the polling will occur. The value is in seconds. The default value is two seconds.

- **Telnet Access** – A feature you must select if the Telnet access to the Altitude AP is enabled, or deselect if the Telnet access to the Altitude AP is disabled.
- **Maintain client session in event of poll failure** – Select this option, if you want the Altitude AP to remain active in case the link with the Summit WM Switch is lost. This allows service for the branch WM-ADs to continue during temporary network outages.
- **User Broadcast for disassociation** – If you want the Altitude AP to use broadcast disassociation when disconnecting all wireless devices instead of disassociating each client one by one, you must select this feature. This feature is disabled by default.
- **Country** – Where the Altitude AP operates.

3. To save your changes, click **Save**.

   The following properties are view only on the **WAP Properties** tab:

   - **Serial #** – A unique identifier that is assigned during the manufacturing process of the Altitude APs.
   - **Hardware Version** – The current version of the Altitude AP hardware.
   - **Application Version** – The current version of the Altitude AP software.
   - **Status** – The Altitude AP state:
     - **Approved** – Indicates that the Altitude AP has received its binding key from the Summit WM Switch in the discovery process.
     - **Pending** – Indicates that the Altitude AP has not been approved as yet to access the Summit WM Switch. Pending Altitude APs will not provide service to client devices until they are approved.
   - **Active Clients** – The number of wireless devices that are currently active on the Altitude AP.

4. Modify other properties according to your needs.
5. To save your changes, click **Save**.

7.5 Configuring static IP address for Altitude APs

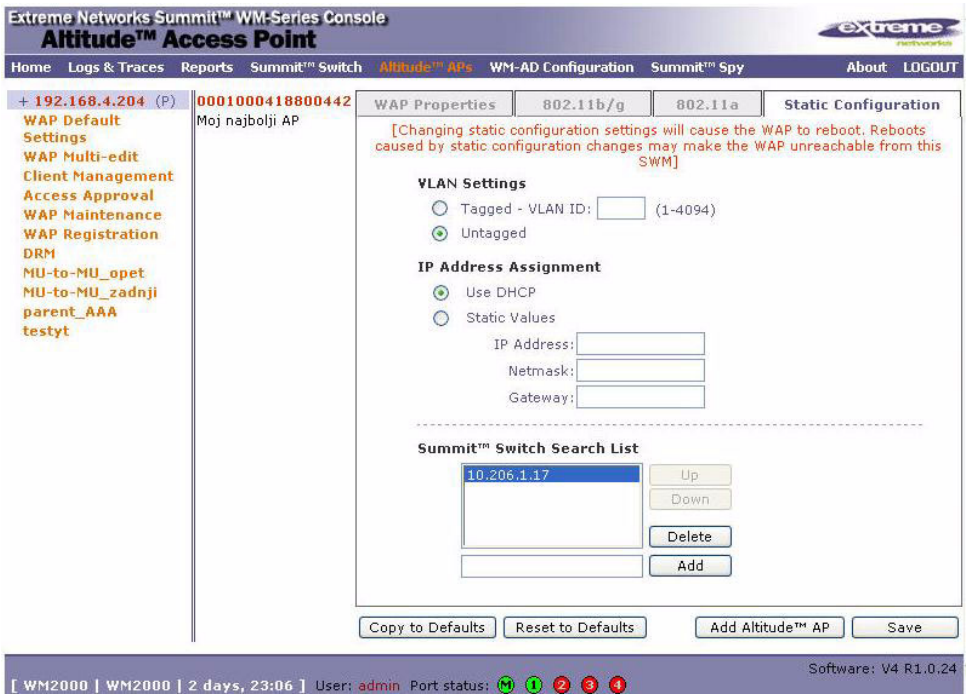
Altitude AP static configuration can be used in both central office and branch office deployments. In order to ensure that the static IP configuration is done correctly, you must use the DHCP initially to obtain an IP address for the Altitude AP. Then use these values in the static IP address configuration.

- **Step 1** – Use the DHCP Server to acquire the IP address

- **Step 2** – Configure the acquired IP address (or any other assigned IP address) as the Static IP address for the Altitude AP.

To configure a static IP address for the Altitude AP:

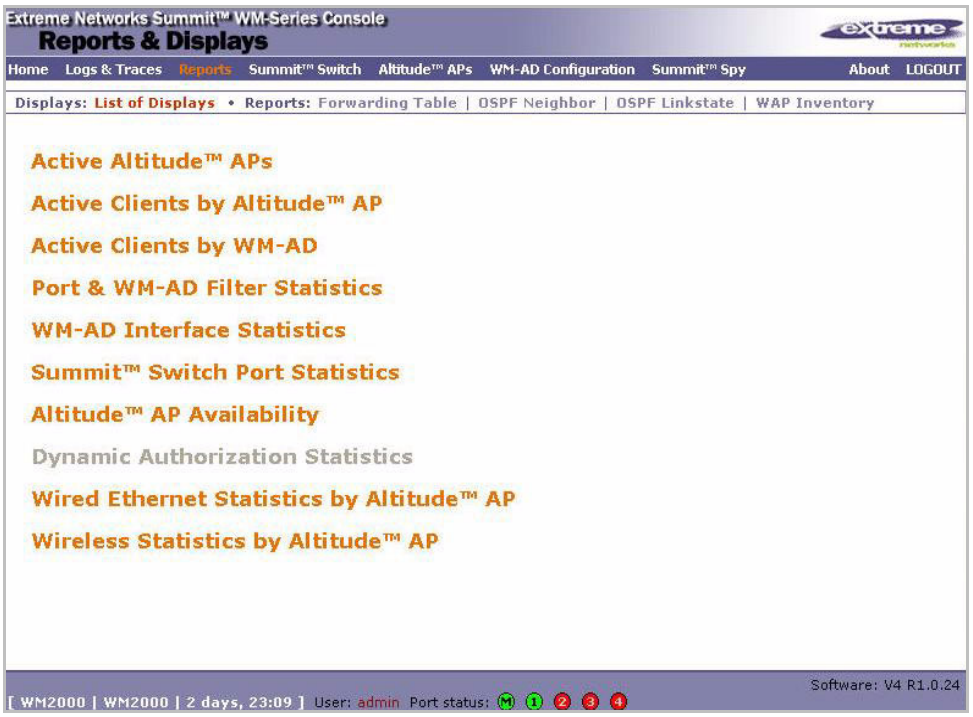
1. From the main menu, click **Altitude AP Configuration**. The **Altitude AP Configuration** screen is displayed.
2. Click the **Static Configuration** tab. The **Configuration Settings** screen is displayed.



3. In the **IP Address Assignment** section, select **Use DHCP.**
4. In the **Add** text box, type the IP address of the Summit WM Switch that will manage this Altitude AP.
5. Click **Add**. The IP address is added to the list.
6. Repeat Steps 4 to 5 to add additional Summit WM Switches.

   The Altitude AP attempts to connect to the IP addresses (of the Summit WM Switches) in the order in which they are listed in the **Summit Switch Search List**. This feature allows the Altitude AP to bypass the discovery process. If the **Summit Switch Search List** is not populated, the Altitude AP will use SLP to discover a Summit WM Switch.
7. To save your changes, click **Save**. The Altitude AP reboots.

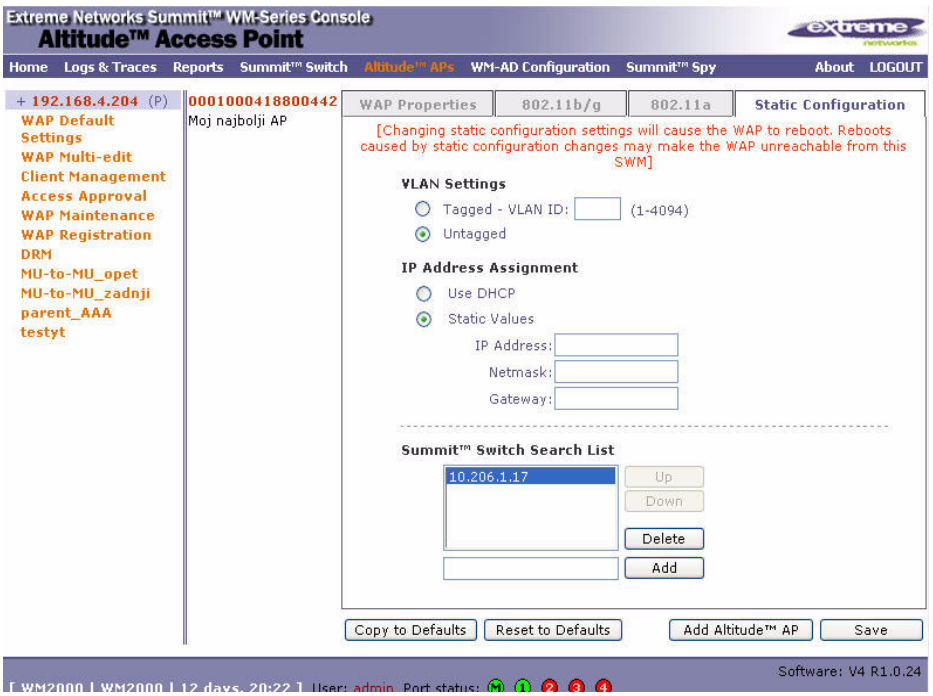
8. From the main menu, click **Reports & Displays**. The **Reports and Displays** screen is displayed.
9. Click **Active Altitude APs**. A list of active Altitude APs is displayed with the



corresponding IP addresses assigned to them by the DHCP server.

10. Locate the Altitude AP for which you are configuring the static IP address in the list, and the corresponding IP address.
11. From the main menu, click **Altitude AP Configuration**. The **Altitude AP** screen is displayed.

12. Click the **Static Configuration** tab.



13. In the IP Address Assignment section, select **Static Values**.
14. In the **IP Address** text box, type the IP address that you obtained by using the DHCP server (or any other assigned IP address).
15. In the **Netmask** text box, type the appropriate subnet mask to separate the network portion from the host portion of the address.
16. In the **Gateway** text box, type the default gateway of the network.
17. To save your changes, click **Save**. The Altitude AP reboots.

7.6 Configuring VLAN tags for Altitude APs

You must exercise caution while configuring VLAN ID tag. If a VLAN tag is not configured properly, the connectivity between the Summit WM Switch and the Altitude AP will be lost.

Note: To configure the VLAN tag for Altitude AP, you must connect the Altitude AP to a point on the central office network that does not require VLAN tagging. If the VLAN tagging is configured correctly and you are still on the central office network, the Altitude AP will lose connection with the Summit WM Switch after it is rebooted (the Altitude AP reboots when the configuration settings are saved). If the Altitude AP does not lose connection with the Summit WM Switch after the reboot, it indicates that the VLAN ID has not been configured correctly. This provides a feedback on whether you have configured the VLAN tag correctly. After the VLAN is configured correctly, you can move the Altitude AP to the target location.

To configure Altitude APs with a VLAN tag:

1. Connect the Altitude AP in the central office to the Summit WM Switch port (or to a network point) that does not require VLAN tagging.
2. In the **VLAN Settings** section, select **Tagged - VLAN ID**.
3. In the **Tagged - VLAN ID** text box, type the VLAN ID on which the Altitude AP will operate.
4. To save your changes, click **Save**. The Altitude AP reboots and loses connection with the Summit WM Switch.
5. Log out from the Summit WM Switch.
6. Disconnect the Altitude AP from the central office network and move it to the target location.
7. Power the Altitude AP. The Altitude AP connects to the Summit WM Switch.

   If the Altitude AP does not connect to the Summit WM Switch, it implies that the Altitude AP was not configured properly. To recover from this situation, you must reset the Altitude AP to its factory default settings, and reconfigure the static IP address. For more information, see Section 7.6.1, "Resetting the Altitude AP to its factory default settings", on page 92.

7.6.1 Resetting the Altitude AP to its factory default settings

You can reset the Altitude AP to its factory default settings if the Altitude APs incorrectly configured.

The Altitude AP boot-up sequence includes a random delay interval, followed by a vulnerable time interval. During the vulnerable time interval (2 seconds), the LEDs flash in a particular sequence to indicate that the Summit WM Switch is in the vulnerable time interval. For more information, see Section 7.7, "Altitude AP's LED states", on page 93.

If you power up the Altitude AP and interrupt the power during the vulnerable time interval three consecutive times, the fourth time the Altitude AP reboots, it will restore its factory defaults including the user password and the default IP settings.

To reset the Altitude AP to its factory default settings:

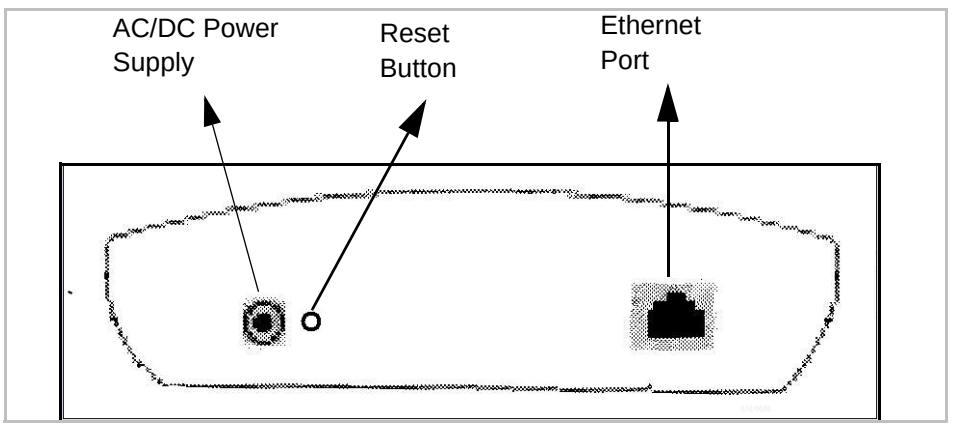
1. Reboot the Altitude AP.
2. Depower and repower the Altitude AP during the vulnerable time interval.
3. Repeat Step 2 two more times.

   When the Altitude AP reboots for the fourth time, after having its power supply interrupted three consecutive times, it restores its factory default settings. The Altitude AP then reboots again to put the default settings into effect.

Reset button (Hardware)

You can also reset the Altitude AP to its factory default settings by pressing and holding the **Reset** button on the Altitude AP for approximately five seconds. Not all models of the Altitude APs have the **Reset** button

The following figure illustrates the location of the **Reset** button on the Altitude APs.



7.7 Altitude AP's LED states

When the Altitude AP is powered on and boots, you can follow its progress through the registration process by observing the LED sequence described below.

The Status LED (center) also indicates power — unlit when unit is off, and green (solid) when the Altitude AP has completed discovery and is operational.

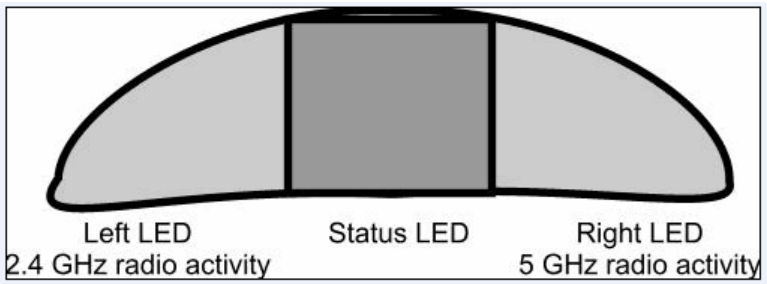


Figure 12 Altitude AP LEDs

Left LED Status	Center LED Status	Right LED Status	Altitude AP Status
Off	Off	Off	Powered-off
Off	Green	Off	Beginning of Power-on-Self-Test (POST) (0.5 seconds)
Off	Off	Off	Power-on-Self-Test (POST
Off	Red	Off	Failure during POST
Green	Off	Green	Random delay – State displayed only after a vulnerable reset
Green/Off	Off/Green	Green/Off	Vulnerable time interval – The Altitude AP resets to factory default if powered-off for three consecutive times during this state. No vulnerable period when Altitude AP is resetting to factory defaults.
Green/Off/Off	Off/Green/Off	Off/Off/Green	Resetting to factory defaults announcement – replaces vulnerable period. This pattern is repeated twice to notify the operator when the factory configuration is restored.
Off	Orange (Green + Red)	Off	Attempting to obtain an IP address via DHCP.
Off	Red/Orange	Off	No DHCP reply has been received.
Off	Green/Orange	Off	Failed discovery (SLP)
Off	Off/Orange	Off	Summit WM Switch has been discovered. Registering the Altitude AP.
Off	Off/Red	Off	Registration of the Altitude AP has failed.
Off	Off/Green	Off	Standby, registered with a Summit WM Switch, waiting for configuration.

Table 5 Altitude AP LED status

Left LED Status	Center LED Status	Right LED Status	Altitude AP Status
Green when 802.11 b/g enabled. Off otherwise.	Green	Green when 802.11a enabled. Off otherwise	Radios enabled per user settings.
Off	Red/Green	Off	Upgrading firmware.

Table 5 Altitude AP LED status

Note: Random delays do not occur during normal reboot. A random delay only occurs after vulnerable period power-down.

Now you must configure the WM-AD via the Summit WM Switch using the Extreme Networks Summit WM-Series Console. The following chapter explains how to configure the WM-AD.

8 WM-AD configuration

This chapter explains how to configure the WM-AD through the Summit WM Switch using the Extreme Networks Summit WM-Series Console.

The topics in this chapter are organized as follows:

8.1 WM-AD topology overview

Summit WM-Series Switch Software provides a versatile means of mapping wireless networks to the topology of an existing wired network. This is accomplished through the assignment of WM Access Domain Services.

When you set up WM Access Domain Services (WM-AD) on the Summit WM-Series Switch, you are defining subnets for groups of wireless users. This WM-AD definition creates a virtual IP subnet where the Summit WM-Series Switch acts as a default gateway for wireless devices.

This technique enables policies and authentication to be applied to the groups of wireless users on a WM-AD, as well as the collecting of accounting information on user sessions that can be used for billing.

When a WM-AD is set up on the Summit WM-Series Switch:

- One or more Altitude APs (by radio) are associated with it
- A range of IP addresses is set aside for the Summit WM-Series Switch's DHCP server to assign to wireless devices

If routing protocol is enabled, the Summit WM-Series Switch advertises the WM-AD as a routable network segment to the wired network, and routes traffic between the wireless devices and the wired network.

Each radio on a Altitude AP can participate in up to four WM-ADs, via the multi-SSID function.

The WM-AD topologies are classified on the basis of the following WM-AD types:

- **Routed WM-AD** – The user traffic is tunneled to the Summit WM Switch. This is the default set-up.
- **Bridge at the WAP WM-AD (Bridge Traffic Locally at WAP)** – The user traffic is directly bridged with VLAN at the AP's point of access (switch port).
- **VLAN bridged WM-AD (Bridge Traffic Locally at SWM)** – The user traffic is tunneled to the Summit WM Switch and is directly bridged with it to a specific VLAN.

Note: Only the following models support VLAN bridged WM-AD (Bridge Traffic Locally at SWM):
• Summit Switch WM2000
• Summit Switch WM200

SSID and AAA determine the WM-AD's network assignment. These network assignments define a framework for carrying out the authentication of the mobile devices.

Creating a new WM-AD involves the following three steps:

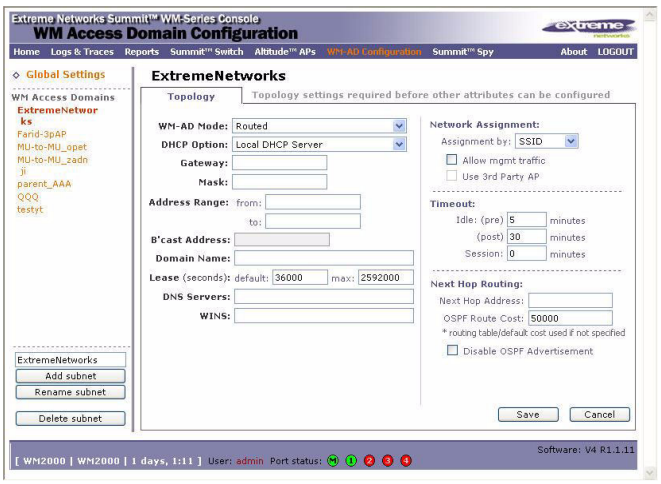
- Assigning a name to the proposed WM-AD
- Defining the topology parameters
- Configuring the WM-AD for authentication and privacy

8.2 Creating and configuring a Routed WM-AD

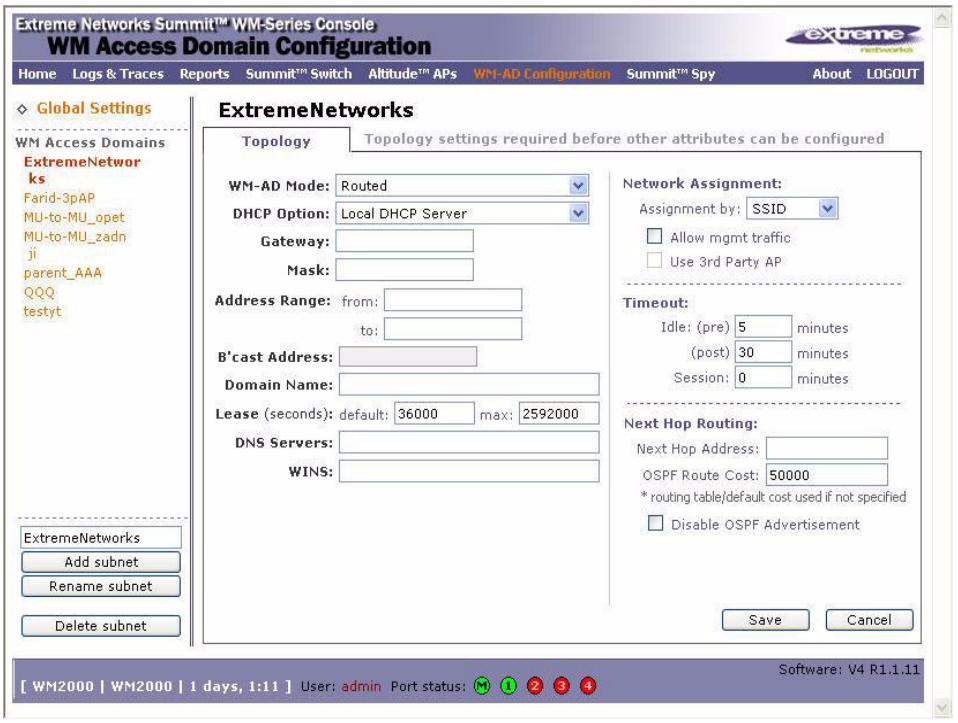
The user traffic is tunneled to the Summit WM Switch in **Routed** WM-AD type. This is the default set-up.

To create and configure a Routed WM-AD type:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.



2. In the **Add subnet** text box, type the WM-AD name.
3. Click **Add subnet**. The name is displayed in the virtual networks list and the **Topology** tab is displayed.



4. From the **WM-AD Mode** drop-down list, click **Routed**.
5. From the **DHCP** drop-down list, click one of the two options:
    - **Local DHCP Server**: If you select **Local DHCP Server**, the built-in DHCP server in Summit WM Switch provides the IP addresses to the devices to the wireless network. For more information, see Section 2.1.5.2, “DHCP for WM-AD”, on page 18.
        - **Gateway** – The Summit WM Switch advertises this address to the wireless devices when they sign on and get a dynamic IP address. The gateway corresponds to the IP address that is communicated to mobile users
        - **Mask** – Subnet mask for this IP address to separate the network portion from the host portion of the address (typically 255.255.255.0).
        - **Address Range** – Range from which the IP addresses are provided to the wireless devices that would use this WM-AD. This text box (from and to) may populate automatically, if you have already provided the range while configuring the APs.
        - **B’cast Address** – Populates automatically based on the Gateway IP address and the subnet mask of the WM-AD.
        - **Domain Name** – External enterprise domain name. You must type the external enterprise domain name in this text box.

- **Lease** – text box has two sub text boxes – **default**, and **maximum**. The two sub text boxes dictate the default and maximum time limits a wireless device can keep the DHCP server-assigned IP address. The default value for **Lease default** is 36000 seconds (10 hours), the default value for **Lease Max** is 2539000 seconds.
- **DNS Server** – This text box relates to the IP address of the domain name server on the enterprise network.

- **Use DHCP Relay**: If you select **Use DHCP Relay**, the local DHCP server on the Summit WM Switch is disabled and the Summit WM Switch instead forwards DHCP requests to the external DHCP server for dynamic IP addresses allocation. For more information, see Section 2.1.5.3, “DHCP relay for WM-AD”, on page 19
  - **Gateway** – For more information, see Step # 5 on page 98.
  - **Mask** – For more information, see Step # 5 on page 98.
  - **DHCP Server** – IP address of the external DHCP server on the enterprise network.

6. From the **Network Assignment** drop-down list, select the network assignment.

   The Network Assignment drop-down list gives you two options – **SSID** and **AAA**. To learn more about SSID and AAA, see Section 8.1, “WM-AD topology overview”.

   - **SSID network assignment**:
     - **Allow mgmt traffic** – If the management traffic is enabled, it overrides the built-in exception filters that prohibit traffic on the Summit WM Switch data interfaces. For more information on filters, see “Section 7.6 Configuring filtering rules for WM-AD” of *Summit WM-Series WLAN Switch Software, V4 WM2000 User Guide.*
     - **Allow 3rd Party AP** – If **Allow 3rd Party AP** is enabled, it allows for the specification of a segregated subnet for non-SWM Altitude APs for providing RF services to the users while still utilizing the Summit WM Switch for user authentication and the user policy enforcement. The definition of third-party AP identification parameters allows the system to be able to differentiate the third-party AP device (and the corresponding traffic) from the user devices on that segment. Devices identified as third-party APs are considered pre-authenticated and are not required to complete the corresponding authentication verification stages defined for the users in that segment.

7. Type the values in the following three **Timeout** text boxes:

   - **Idle (Pre) Timeout** – Number of seconds a user is allowed to be idle on the WM-AD before authentication.

- **Idle (Post) Timeout** – Number of seconds a user is allowed to idle on the WM-AD after authentication.
- **Session** – Maximum amount of time a session is allowed on the system. If you leave this text box blank, there will be no time limit.

8. Type the values in the **Next Hop Routing** text boxes.
   - **Next Hop Address** – The next-hop IP identifies the target device to which all WM-AD (user traffic) will be forwarded to. Next-hop definition supersedes any other possible definition in the routing table.
   - **OSPF Route Cost** – The OSPF cost value provides a relative cost indication to allow upstream routers to calculate whether or not to use the Summit WM Switch as a better fit, or lowest cost path to reach the devices in a particular network. The higher the cost, the less likely that the Summit WM Switch will be chosen as a route for traffic, unless that Summit WM Switch is the only possible route for that traffic.
   - **Disable OSPF Advertisement** – To disable the OSPF advertisement on the WM-AD select **Disable OSPF Advertisement**.
9. To save your changes, click **Save**.

As a next step, you must configure the authentication mechanism for the WM-AD. For more information, see Section 8.5, “Configuring authentication mechanism for WM-AD”.

8.3 Creating and configuring a Bridge Traffic Locally At SWM WM-AD

Note: Only the following models support Bridge Traffic Locally at SWM:
• Summit Switch WM2000
• Summit Switch WM200

To configure a bridge traffic locally at SWM WM-AD:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the **Add subnet** text box, type the WM-AD name.
3. Click **Add subnet**. The name is displayed in the virtual networks list and the **Topology** tab is displayed.
4. From the **WM-AD Mode** drop-down list, click **Bridge Traffic Locally At SWM**. The following text boxes are displayed:

- **DHCP Option** – Provides you the option of either using the external DHCP server or the local DHCP server on the Summit WM Switch. For more information, see Step # 5 of Creating and configuring “Routed” WM-AD.
- **VLAN ID** – The ID #of VLAN that is mapped to a Summit WM Switch interface.
- **Interface** – The name of the interface to which the VLAN is mapped.
- **Interface IP address** – The interface’s IP address.
- **Mask** – The subnet mask of the WM-AD.

5. From the **Network Assignment** drop-down list, click the network assignment. For more information on network assignment, see “Step # 6 of Creating and configuring Routed WM-AD”.
6. Type the values in the following three **Timeout** text boxes – **Idle (Pre)**, **Idle (Post)**, and **Session**. For more information on **Timeout** text boxes, see “Step # 7 of Creating and configuring Routed WM-AD”.
7. To save your changes, click **Save**.

As a next step, you must configure the authentication mechanism for the WM-AD. For more information, see Section 8.5, “Configuring authentication mechanism for WM-AD”.

8.4 Creating and configuring a Bridge Traffic Locally At WAP WM-AD

This configuration enables the WM-AD to provide branch office mode. The **VLAN ID** for the branch office is assigned by the office network administrator. The Altitude AP will operate correctly only when the **VLAN ID** is unique per AP.

To configure a Bridge traffic locally at AP WM-AD:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the **Add subnet** text box, located in the lower portion of the left pane, type the WM-AD name.
3. Click **Add subnet**. The name is displayed in the virtual networks list and the **Topology** tab is displayed.
4. From the **WM-AD Mode** drop-down list, click **Bridge Traffic Locally At APWAP**. The **VLAN Setting** text boxes are displayed.
5. To define the VLAN setting, select one of the following:
   - **Tagged** – If you select **Tagged**, type the VLAN ID in **VLAN ID** text box. The default value is 1.

- **Untagged** – If you select **Untagged**, the VLAN will be untagged.

6. To save your changes, click **Save**.

You have created a WM-AD. Now you must configure the authentication mechanism for the WM-AD.

The following section explains how to configure the authentication mechanism.

8.5 Configuring authentication mechanism for WM-AD

The Summit WM Switch offers several authentication options. The options can be classified under network assignment types – **SSID** and **AAA** (Authentication, Authorization and Accounting).

- **SSID** – The SSID network assignment type offers the following authentication options:
  - By Captive Portal
    - By internal Captive Portal
    - By external Captive Portal
    - No Captive Portal support
  - By MAC-based authentication

Note: You must note here that the internal Captive Portal does not substitute the external RADIUS server. The RADIUS server is still needed. The internal Captive Portal within the Summit WM Switch displays the webpage to enable the users to supply their user name and password. The user name and password are sent to the configured RADIUS server for authentication.
In case of external Captive Portal, webpage authentication is performed by the external Captive Portal.

- **AAA** – The **AAA** (Authentication, Authorization and Accounting) network assignment type offers the following authentication options:
  - By 802.1x authentication – The mobile user is authenticated before gaining access to the network.
  - By MAC-based authentication – The mobile user is authenticated on the basis of their MAC address.

The following figure illustrates the authentication options:

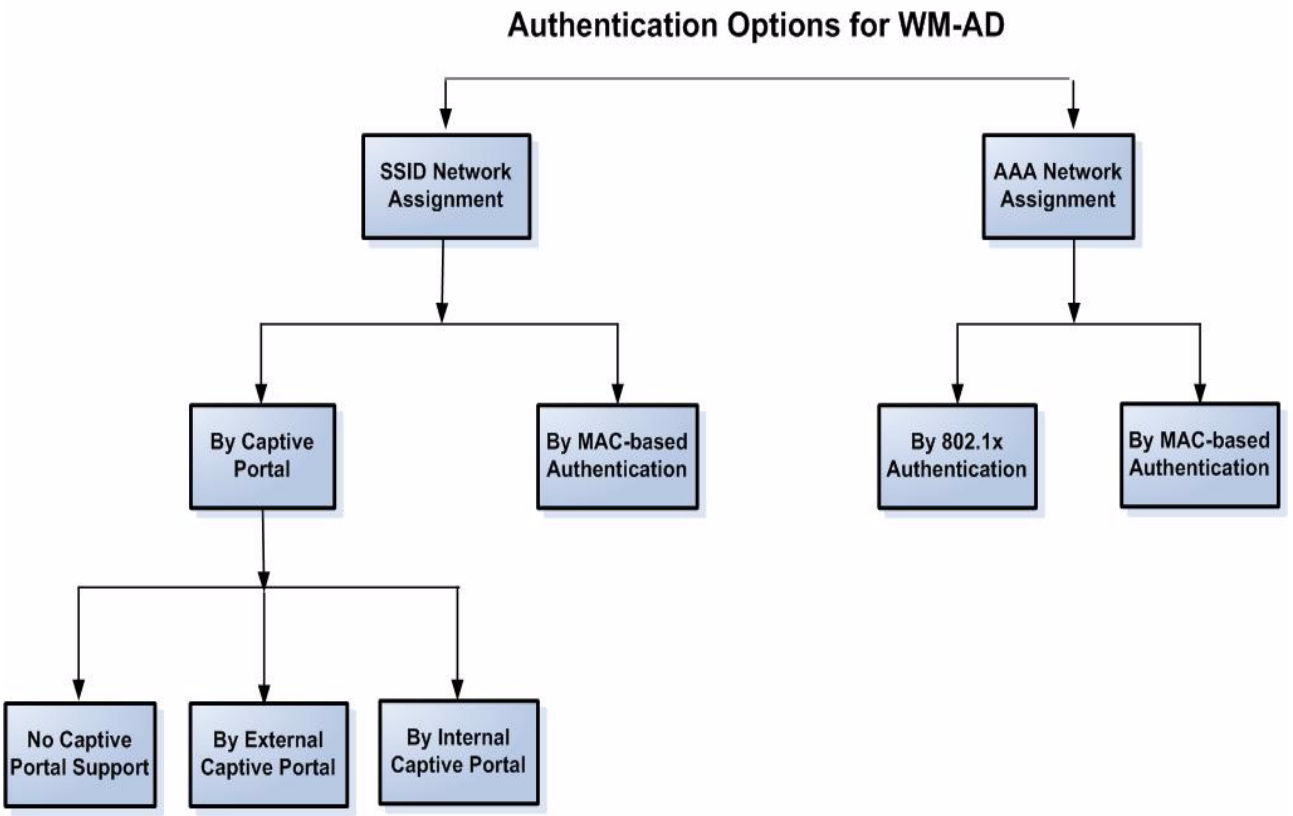


Figure 13 Authentication options

MAC-based authentication can be used in both SSID network assignment and AAA network type assignment.

8.5.1 Authentication mechanism for SSID network assignment

The SSID network assignment provides the following authentication options:

- Captive Portal authentication.
  - Internal Captive Portal
  - External Captive Portal
  - No Captive Portal Support
- MAC-based authentication

8.5.1.1 Configuring internal Captive Portal authentication

In order to configure the authentication mechanism, you must first create and configure a WM-AD. For more information, see the following:

- Section 8.1, “WM-AD topology overview”
- Section 8.2, “Creating and configuring a Routed WM-AD”;
- Section 8.3, “Creating and configuring a Bridge Traffic Locally At SWM WM-AD”.

To configure internal Captive Portal:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, select the **SSID WM-AD** for which you want to configure the authentication mechanism. The **Topology** tab is displayed.
3. Click the **Auth & Acct** tab. The **Auth & Acct** text boxes are displayed in the right pane.

   The **Auth & Acct** tab offers you the following thee options:

   - **Auth** – Defines the authentication servers.
   - **MAC** – Defines the servers for MAC-based authentication.
   - **Acct** – Defines the accounting servers.
4. Click **Auth**. The authentication text boxes are displayed.
5. From the **RADIUS** drop-down list, click the server that you want to use for Captive Portal authentication. The selected server is displayed in the list of **Config’d Servers** and a red asterisk is displayed next to **Auth**, indicating that the server has been assigned.

   Note: The **RADIUS** drop-down list reflects the servers that are defined on the **Global Settings** screen. For more information, see the *Summit WM-Series WLAN Switch Software, V4 V4.0, WM2000 User Guide”*.

   Use the **Up** and **Down** buttons to prioritize the servers for redundancy. The servers are prioritized in the sequence they are displayed in the list of **Config’d Servers**. You can change the sequence by selecting the server and then clicking on the **Up** and **Down** buttons.
6. Type the appropriate values in the **Auth** text boxes.

   - **Port** – Used to access the RADIUS server. The default is 1812.
   - **# of Retries** – Number of times the Summit WM Switch will attempt to access the RADIUS server.

- **Timeout** – Maximum time for which Summit WM Switch will wait for a response from the RADIUS server before making a re-attempt.
- **NAS Identifier** – RADIUS attribute that identifies the server responsible for passing information to the designated servers and then acting on the response returned. This is an optional text box.
- **Auth Type** – Authentication protocol to be used by the RADIUS server to authenticate the wireless device users. The four options are:
  - AP – Password authentication protocol
  - CHAP – Challenge handshake authentication protocol
  - MS-CHAP – Windows-specific version of CHAP
  - MS-CHAP v2– Windows-specific version of Chap (Version 2)
- **Set as primary server** – Select to configure the RADIUS server as the primary server.

7. Select the appropriate checkbox against **Include VSA Attributes**.

   Vendor Specific Attributes feature provides you the following three options:

   - APs
   - WM-AD
   - SSID

   These VSA are defined on the RADIUS server.

8. To reset the server that you are configuring as the primary server, click **Reset to Primary** button is enabled and you want to reset the server (that you are configuring) as the primary server, click **Reset to Primary**.

   The **Reset to Primary** button is enabled in the following RADIUS redundancy set-up scenarios:

   - The Summit WM Switch's connection to the primary RADIUS server fails.
   - The Summit WM Switch automatically attempts and is successful in initiating a connection with the alternative RADIUS server.
   - The alternative RADIUS server becomes the primary server.

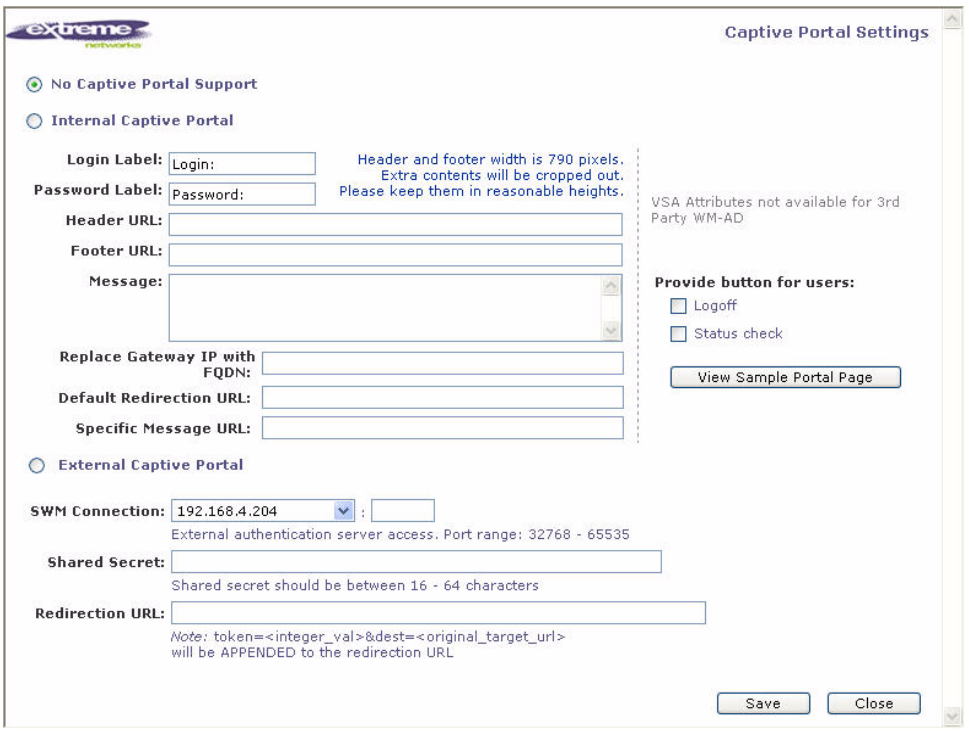
   If you want the server that you are configuring to be the primary server, you must click on the enabled **Reset to Primary** button.

9. To save your changes, click **Save**.

10. Test the Summit WM Switch's connection to all configured RADIUS servers.

    To test the connection with the RADIUS servers, click **Test**. The RADIUS servers display the message transaction on their screens. You must visually verify the state of the server connection and the user authentication.

11. Click **Configure Captive Portal Settings**. The **Captive Portal Configurations** screen is displayed.



12. Select the **Internal Captive Portal** option.
13. Type the values in the following text boxes:
    - **Login Label** – The text that will appear as a label for the user name.
    - **Password Label** –The text that will appear as a label for the user password text box.
    - **Header URL** – The URL of the file to be displayed in the header of the Captive Portal screen.
    - **Footer URL** – The URL of the file to be displayed in the footer of the Captive Portal screen.

Note: The maximum width allowed for the header and footer is 790 pixels. There is no restriction on the height.
If the width of the header/footer is more than 790 pixels, the header/footer will appear truncated on the Captive Portal screen.

    - **Message** – The message that you type in this text box will appear above the **Login** text box to greet the user. You can type a message explaining why the Captive Portal screen is displayed and the instructions for the user.

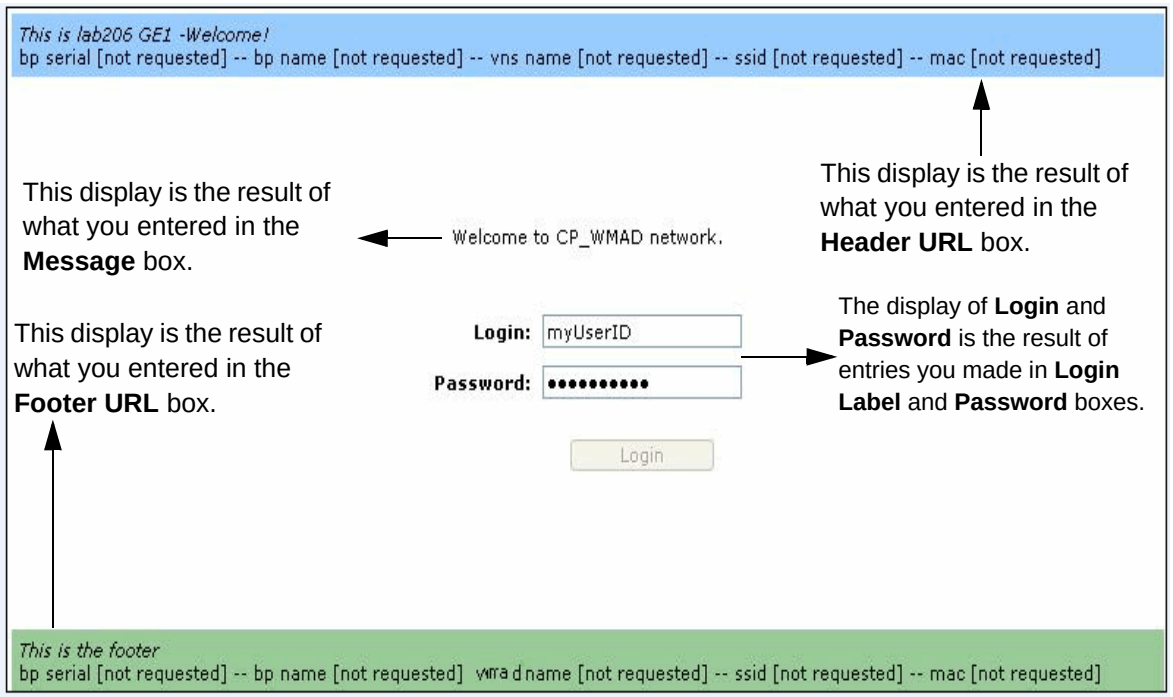
- **Replace Gateway IP with FQDN** – If you are using FQDN (Fully Qualified Domain Name) as the gateway address, you must type the FQDN in this text box.
- **Default Redirection URL** – The URL to which the wireless devices will be directed before authentication.
- **Specific Message URL** –

14. In the right pane, select the VSA (Vendor Specific Attributes) that you want to send to the authentication server along with other authentication details for authentication purpose.
    - AP Serial Number
    - AP Name
    - WM-AD Name
    - SSID
    - MAC Address

    The selection of these VSAs dictate with what VSA the wireless users will be identified. For example, the wireless users can be identified by which Altitude AP or WM-AD they are using.
15. To provide the users with logoff button to signout, select **Logoff**.

    If you select **Logoff**, the users will be provided with a logoff button to signout. The logoff button launches a pop-up logoff screen, empowering the users to control their logoff.
16. to provide the users with a status check button, select **Status check**.

    The **Status check** button enables the users to monitor session statistics such as system usage and time left in a session.
17. To save your changes, click **Save**.
18. To review your Captive Portal page, click **View Sample Portal**. The login screen of the portal is displayed.



8.5.1.2 Configuring external Captive Portal authentication

In order to configure the authentication mechanism, you must first create and configure a WM-AD. For more information, see the following.

- Section 8.1, “WM-AD topology overview”
- Section 8.2, “Creating and configuring a Routed WM-AD”
- Section 8.3, “Creating and configuring a Bridge Traffic Locally At SWM WM-AD”.

To configure external Captive Portal:

1. Configure internal captive portal authentication. For more information, see Step 1 to Step 10 of Section 8.5.1.1, “Configuring internal Captive Portal authentication”, on page 104.
2. Click **Configure Captive Portal** option. The **Captive Portal Configuration** screen is displayed.
3. Select the **External Captive Portal** option.
4. In the **SWM Connection** drop-down list, click the Summit WM Switch’s IP address.
5. In the **Port** text box, type the Summit WM Switch’s port.

6. In the **Shared Secret** text box, type the password for encrypting the information exchanged between the Summit WM Switch and the external Captive Portal server.
7. In the **Redirection URL** text box, type the URL to which the wireless user will be directed before the authentication.
8. To save your changes, click **Save**.

8.5.1.3 No Captive Portal support

By default, a new WM-AD with SSID network assignment type is assigned **None** authentication. A SSID WM-AD with this set-up circumvents all authentication mechanisms and the Summit WM Switch accepts all wireless devices without any authentication.

However, even with **None** authentication option, you can still control access to the network by defining appropriate filtering rules for **Non-authenticated** filters. For more information, see Section 8.6.1.2, “Configuring filtering rules for a Non-authenticated filter”, on page 113.

None authentication does not mean that no authentication will take place. Instead, the default filter is applied for the authentication. For more information, see Section 8.5.1.3, “No Captive Portal support”, on page 109.

To configure None authentication:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, select the **SSID WM-AD** for which you want to configure the authentication mechanism. The **Topology** tab is displayed.
3. Click the **Auth & Acct** tab.
4. Click **Configure Captive Portal**. The **Captive Portal Configuration** screen is displayed.
5. Select the **No Captive Portal Support** option.
6. To save your changes, click **Save**.

Note: In order to control network access of the wireless device users on this WM-AD, you must define appropriate rules in **Default** filter.
The rules in the **Default** filter should be very restrictive when you use **None** authentication mechanism.
You must configure the final rule in the **Default** filter a **deny all** rule.
For more information, see Section 8.6.1.3, “Configuring filtering rules for Default filter”, on page 114.

8.5.1.4 Configuring MAC-based authentication

MAC-based authentication restricts wireless device's access to the network, based on its MAC addresses. The Summit WM Switch relays the client devices' MAC address to a RADIUS server on your network following which the RADIUS server checks the address against a list of allowed MAC addresses. If the client device's MAC address matches one in the list of allowed MAC addresses in the RADIUS server, the user is granted access to the network.

To set-up the RADIUS server for MAC-based authentication, you must set-up a user account with User ID=MAC and Password= MAC for each user.

To define MAC-based authentication for a WM-AD:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration screen** is displayed.
2. In the left pane, select the **SSID WM-AD** for which you want to configure the authentication mechanism. The **Topology** tab is displayed.
3. Click the **Auth & Acct** tab.
4. Click **MAC**.
5. From the **RADIUS** drop-down list, click the server that you want to use for MAC authentication.
6. Click **Use**. The selected server is displayed in the list of **Config'd Servers** and a red asterisk is displayed next to **MAC**, indicating that the server has been assigned.

Note: The **RADIUS** drop-down list reflects the servers that are defined on the **Global Settings** screen. For more information, see "*Summit WM-Series WLAN Switch Software, V4, WM2000 User Guide*".

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7. If your RADIUS server is being used for another type of authentication or accounting, select **Use server for MAC Authorization**.
8. Type the values in the **MAC** text boxes.
   - **Port** – Port used to access the RADIUS server. The default is 1812.
   - **# of Retries** – Number of times the Summit WM Switch will attempt to access the RADIUS server.
   - **Timeout** – Maximum time for which Summit WM Switch will wait for a response from the RADIUS server before making a re-attempt.
   - **NAS IP Address** – IP address of the network access server (NAS).
   - **NAS Identifier** – RADIUS attribute that identifies the server responsible for passing information to the designated servers. This is an optional text box.

- **Auth Type** – Provides four options for the authentication protocol to be used by the RADIUS server to authenticate the wireless device users:
  - PAP – Password authentication protocol
  - CHAP – Challenge handshake authentication protocol
  - MS-CHAP – Windows-specific version of CHAP
  - MS-CHAP – Windows-specific version of Chap (Version 2)
- **Set as primary server** – To set the RADIUS server as the primary server, select **Set as the primary server**.
- **MAC-based authentication on roam check** – To ensure that the client devices are authorized every time they roam to another AP, select **MAC-based authentication on roam check**. If you don't select this feature, the client devices will be authenticated only at the start of their sessions.

9. To save your changes, click **Save**.

8.5.2 Authentication mechanism for AAA network assignment

The AAA (Authentication, Authorization and Accounting) network assignment provides the following two authentication options:

- 802.1x authentication.
- MAC-based authentication

The following sections explain the above two authentication options.

8.5.2.1 Configuring 802.1x authentication

For more information, see Section 8.7.2, "Configuring privacy for AAA network assignment", on page 118.

Note: Since Section 8.7.2, Privacy for AAA network assignment, is part of Privacy policies configuration, you can configure 802.1x authentication after you complete the configurations for authentication and filtering rules

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8.5.2.2 Configuring MAC-based authentication

MAC-based authentication can be used in both SSID network assignment and AAA network type assignment. For more information, see Section 8.5.1.4, “Configuring MAC-based authentication”.

Now you must configure the WM-AD for filters. The following section describes how to configure the WM-AD filters.

8.6 Configuring filtering rules

On a per WM-AD basis, the Summit WM Switch can be configured to apply a specific filtering policy on the user traffic that is routed through it. The filtering policies are applied after the authentication is returned.

The filter definition can be static on the Summit WM Switch itself, or the filter definition can be set to dynamically provisioned if RADIUS authentication is used. The standard RADIUS attribute can be used to identify a specific filter definition to apply to incoming/outgoing user traffic upon successful authentication of the user during authentication.

For more information, see *Summit WM-Series WLAN Switch Software WM2000 User Guide.*

8.6.1 Configuring filtering rules for filters in SSID network assignment

The SSID network assignment type offers the following three default filters:

- Exception
- Non-authenticated
- Default

8.6.1.1 Configuring filtering rules for Exception filter

To configure rules for the Exception filter:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, click the **SSID WM-AD** for which you want to define the filtering rules. The **Topology** tab is displayed.
3. Click the **Filtering** tab.

4. From the **Filter ID** drop-down list, click **Exception**.
5. Define a filtering rule.
   a) In the **IP/subnet:port** text box, type the destination IP address.

      You can also specify the IP range, a port designation or a port range on the IP address in the **IP/subnet:port** text box.

   b) From the **Protocol** drop-down list, click the applicable protocol.

      The default is **N/A**.

   c) Click **Add**. The filtering rule is displayed.
6. Define a rule to allow access to the default gateway for this WM-AD.
   a) Select the **IP:Port** of the filtering rule that you defined in Step 5.
   b) In the **IP/subnet:port**, type the default gateway IP address (WM-AD's IP address) that you defined in the **Topology** tab for this WM-AD.
   c) Click **Add**. The rule is displayed.
7. Define more rules by carrying out Step 5 and Step 6.
8. Check the **Allow** feature for every rule you created.

   You may edit the order of the rules by selecting a filter and clicking the **Up**/**Down** buttons. The filtering rules are executed in the order that is displayed on the screen.
9. To save your changes, click **Save**. The rules for the **Exception** filter are saved.

8.6.1.2 Configuring filtering rules for a Non-authenticated filter

The rules for a Non-authenticated filter enable you to identify and manage the destinations to which a mobile device is allowed to gain access without undergoing an authentication redirection. Typically, the recommended default rule is to deny all. Administrators must define the rules that will permit users to access essential services such as the following:

- DNS
- Default Gateway (WM-AD interface IP)

Any HTTP streams requested by the client for denied targets will be redirected to the specified location. For more information, see the *Summit WM-Series WLAN Switch Software WM2000 User Guide*.

To configure rules for the Non-authenticated filter.

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, select the SSID WM-AD for which you want to configure the **Non-authenticated** filtering rules. The **Topology** tab is displayed.
3. Click the **Filtering** tab.
4. From the **Filter ID** drop-down list, click **Non-authenticated**.
5. Define a filtering rule.
   a) In the **IP/subnet:port** text box, type the destination IP address.

      You can also specify the IP range, a port designation or a port range on the IP address in the **IP/subnet:port** text box.

   b) From the **Protocol** drop-down list, click the applicable protocol.

      The default is **N/A**.
6. For Captive Portal assignment, define a rule to allow access to the default gateway for this WM-AD
   a) Select the **IP:Port** of the filtering rule that you defined in Step 5.
   b) In the **IP/subnet:port**, type the default gateway IP address (**WM-AD's** IP address) that you defined in the **Topology** screen for this WM-AD.
7. Click **Add**. The rule is displayed in the middle of the screen.
8. If applicable, define more rules by repeating Steps 5 and 6.
9. To allow the traffic between the wireless device and the network, Select **In and Out**.
10. Select the **Allow** feature for every rule you created.
11. To save your changes, click **Save**.

8.6.1.3 Configuring filtering rules for Default filter

The Default filter is applied by default (automatically) after the authentication of the wireless device under the following circumstances:

- No match is found in the Exception filter rules
- No filter attribute value is returned by the authentication server for the device
- No match is found in the filter ID values

In order to ensure that a packet is not dropped entirely under the above circumstances, the final rule in the **Default** filter must be **Allow All**.

To configure rules for the Default filter:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, click the WM-AD for which you want to configure the **Default** filtering rules. The **Topology** tab is displayed.
3. Click the **Filtering** tab.
4. From the **Filter ID** drop-down list, click **Default**. The default rule in the **Default** filter is displayed.

   The default rule in the **Default** filter displays a Deny All configuration. You can modify the configuration to Allow All, if it is appropriate for the network needs of the WM-AD.

   If applicable, you can create more rules for the **Default** filter.
5. Configure filtering rules for the Exception filter. For more information, see Step 5 to Step 8 of Section 8.6.1.1, “Configuring filtering rules for Exception filter”, on page 112.
6. To save your changes, click **Save**.

8.6.2 Configuring filtering rules for filters in AAA network assignment

The **AAA** network assignment type offers the following two default filters:

- Default
- Exception

In **AAA** network assignment type, a **Non-authenticated** filter becomes unnecessary because the users are already authenticated.

For more information, see Section 8.6.1.1, “Configuring filtering rules for Exception filter”, on page 112, and Section 8.6.1.3, “Configuring filtering rules for Default filter”, on page 114.

Now you must configure privacy for the WM-AD. The following section explains how to configure privacy.

8.7 Configuring privacy for WM-AD

Privacy is a mechanism that protects data over wireless and wired networks using encryption techniques.

The Summit WM Switch provides several privacy mechanism to protect data over the WLAN. The privacy mechanism can be classified on the basis of network assignment types — SSID and AAA.

8.7.1 Configuring privacy for SSID network assignment

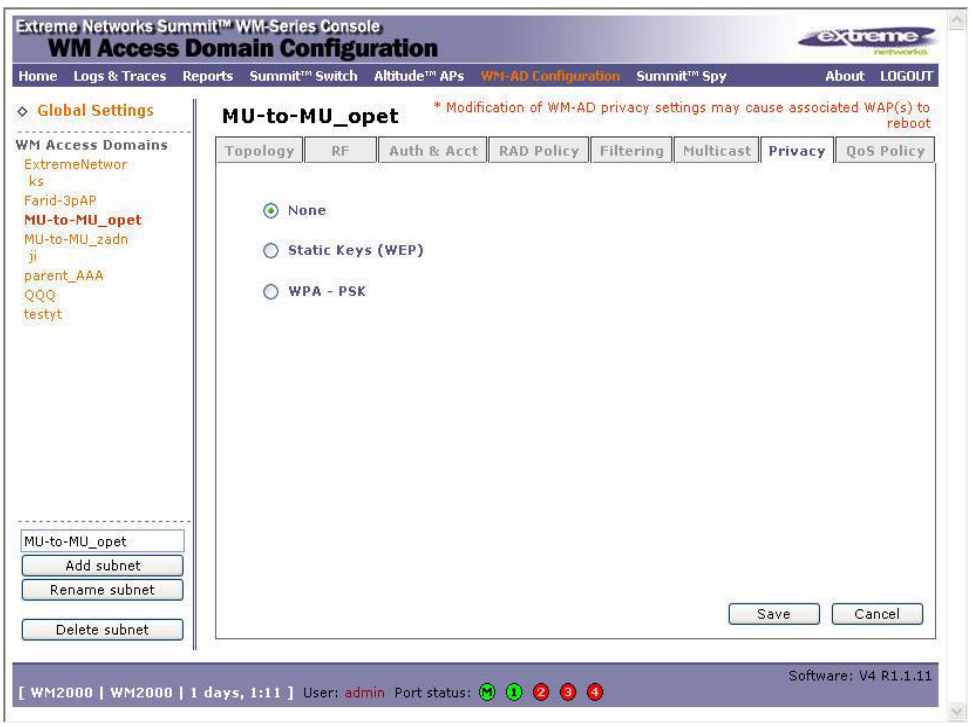
The SSID network assignment provides three privacy options:

- None
- Static WEP
- WPA pre-shared key (PSK)

8.7.1.1 Configuring Static WEP

To configure Static WEP:

1. From the main menu, click **WM Access Domain Configuration**. **The WM Access Domain Configuration** screen is displayed.
2. In the left pane, click the **SSID WM-AD** for which you want to configure the **Static WEP** privacy. The **topology** tab is displayed.
3. Click the **Privacy** tab.



4. Select **Static Keys (WEP)**.
5. Type the values in the following text boxes:
   - **WEP Key Length** – Size of a WEP Key.

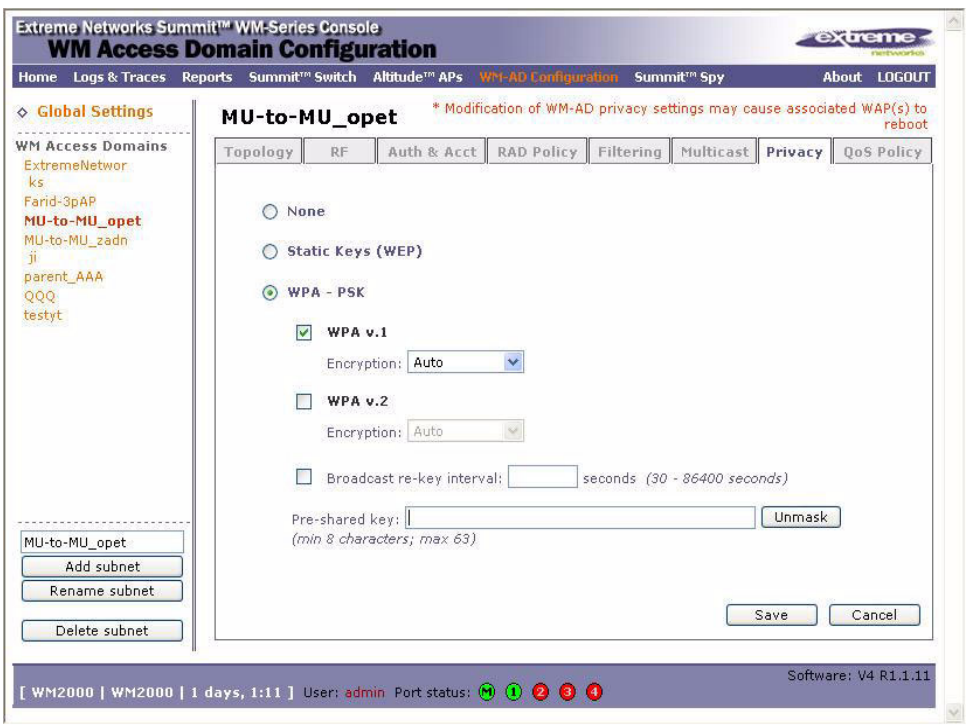
- **Input Hex** – If you enable **Input Hex**, the **WEP Key** text box is displayed. Type the **WEP Key** manually in this text box.
- **Input String** – If you select **Input String**, the following two text boxes are displayed –**Strings** and **WEP Key**. Type the secret WEP Key string in the **WEP Key String** text box. The **WEP Key** text box is automatically filled by the corresponding Hex code.

6. To save your changes, click **Save**.

8.7.1.2 Configuring WPA-PSK

To configure WPA-PSK privacy:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, click the **SSID WM-AD** for which you want to configure WPA-PSK privacy. The **Topology** tab is displayed.
3. Click the **Privacy** tab.
4. Select **WPA-PSK**.



5. Select **WPA v1**.

   If you select WPA v1, its subordinate **Encryption** drop-down menu is enabled.

The **Encryption** drop-down menu offers you the following two options:

- **Auto** – If you click **Auto**, the Altitude AP will advertise both TKIP and **CCMP** (counter mode with cipher block chaining message authentication code protocol).
- **TKIP only** – If you click **TKIP only**, the Altitude AP will advertise TKIP as an available encryption protocol. It will not advertise CCMP.

6. Select **WPA v2**.

   If you select WPA v2, its subordinate **Encryption** drop-down menu is enabled.

   The Encryption drop-down menu offers you the following two options – **Auto** and **TKIP** only. For more information, see Step # 5 on page 117.

7. To enable re-keying after a time interval, select **Broadcast re-key interval**.

   If this feature is not selected, the broadcast encryption key is never changed and the Altitude AP will always use the same broadcast key for broadcast/multicast transmissions. This will compromise the security for wireless communications.

8. In the **Broadcast re-key interval** text box, type the time interval after which you want the broadcast encryption key to be changed automatically. The default is 3600.

9. In the **Pre-shared Key** text box, type the shared secret key that is to be used between the wireless device and the Altitude AP.

   The shared secret key is used to generate the 256 bit key.

10. To confirm your entry, click **Unmask**. The shared key entry is displayed.

    You must always unmask the shared secret key before you save your settings.

11. To save your changes, click **Save**.

8.7.2 Configuring privacy for AAA network assignment

The AAA (Authentication, Authorization and Accounting) assignment provides following privacy mechanisms:

- Static keys (WEP)
- Dynamic WEP keys
- Wi-fi Protected Access (WPA) version 1 with encryption by temporal key integrity protocol (TKIP)

- Wi-fi Protected Access (WPA) version 2 with encryption by advanced encryption standard with counter-mode/CBC-MAC protocol (AES-CCMP)

8.7.2.1 Configuring Static WEP

To configure Static WEP:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, click the **AAA WM-AD** for which you want to configure the **Static WEP** privacy. The **topology** tab is displayed.
3. Click the **Privacy** tab.
4. Repeat Step 4 to Step 6 of Section 8.7.1.1, “Configuring Static WEP”, on page 116.

8.7.2.2 Configuring Dynamic WEP

The dynamic key WEP mechanism changes the key for each user and each session.

To set up Dynamic WEP privacy:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, click the **AAA WM-AD** for which you want to configure the Dynamic WEP privacy. The **Topology** tab is displayed.
3. Click the **Privacy** tab.
4. Select **Dynamic Keys**.
5. To save your changes, click **Save**.

8.7.2.3 Configuring Wi-fi Protected Access (WPA v1 and WPA v2) privacy

WPA v1 and WPA v2 adds authentication to WEP encryption and key management. The authentication portion of WPA for AAA is in enterprise mode. Key features of WPA privacy include:

- Specifies 802.1x with extensible authentication protocol (EAP)
- Uses RADIUS protocols for authentication and key distribution; therefore, requires a RADIUS or other authentication server.

- Centralizes management of user credentials.

The WPA authentication process involves the following steps:

- **Step 1** – The wireless device associates with Altitude AP.
- **Step 2** – The Altitude AP blocks the wireless device's network access while the authentication process is carried out. The Summit WM Switch sends the authentication request to the RADIUS authentication server.
- **Step 3** – The wireless device provides credentials that are forwarded to the authentication server through the Summit WM Switch.
- **Step 4** – If the wireless device is not authenticated, the device remains blocked from the network.

For more information, see the *Summit WM-Series WLAN Switch Software User Guide*.

To configure WPA privacy:

1. From the main menu, click **WM Access Domain Configuration**. The **WM Access Domain Configuration** screen is displayed.
2. In the left pane, click the **AAA WM-AD** for which you want to configure the Dynamic WEP privacy. The **Topology** tab is displayed.
3. Click the **Privacy** tab.
4. Select **WPA**. The **WPA** text boxes are displayed.
5. Select one of the following:
   - **WPA v1**:
     - **Auto** – If you click **Auto**, the Altitude AP will advertise both TKIP and **CCMP** (counter mode with cipher block chaining message authentication code protocol).
     - **TKIP only** – If you click **TKIP only**, the Altitude AP will advertise TKIP as an available encryption protocol. It will not advertise CCMP.
   - **WPA v2**:
     - **Auto**: For more information, see the description of **Auto** under **WPA v1**.
     - **TKIP only**: For more information, see the description of **TKIP only** under **WPA v1**.

   If you select WPA v1, its **Encryption** drop-down menu is enabled. The **Encryption** drop-down menu offers the following two options:
6. For re-keying after a time interval, select **Broadcast re-key interval**.

If this feature is not enabled, the broadcast encryption key is never changed and the Altitude AP will always use the same broadcast key for broadcast/multicast transmissions. This will compromise the security for wireless communications.

7. In the **Broadcast re-key interval** text box, type the time interval after which you want the broadcast encryption key to be changed automatically. The default is 3600.
8. To save your changes, click **Save**.

You have completed the WM-AD configuration.

Now you must configure the Summit WM Switch's availability and mobility features. The following chapter describes how to configure the Summit WM Switch's availability and mobility features.

9 Availability and Mobility configuration

The chapter describes how to configure the Summit WM Switch's availability and mobility features.

The topics in this chapter are organized as follows:

9.1 Availability overview

The Summit WM-Series WLAN Switch Software solution's availability feature maintains service availability in the event of a Summit WM Switch outage.

The availability feature links two Summit WM Switches to form a pair in order to share information about their Altitude APs. If one Summit WM Switch fails, its Altitude APs are allowed to connect to the other Summit WM Switch.

The Altitude APs that connect to a backup Summit WM Switch during a failover are assigned to the WM-AD that is defined in the Summit WM Switch's default Altitude AP configuration. If the default Altitude AP configuration does not exist for the backup Summit WM Switch, the failover Altitude APs will not be assigned to any WM-AD, and will therefore not provide service. Therefore it is very important to define a default Altitude AP configuration on all Summit WM Switches.

9.2 Configuring availability feature

Before you begin the availability configuration, you must ensure:

- A network connection exists between the two Summit WM Switches. This connection is used to enable the availability link between the Summit WM Switches. The availability link is established on port 13907.
- A DHCP server for the Altitude AP subnets is setup to support "Option 78 for SLP", so that it points to the IP addresses of the physical interfaces on both the Summit WM Switches.

High-level overview of the availability configuration process

The following is a high-level overview of the availability configuration process:

- Step 1 – Define a WM-AD with the same SSID on each Summit WM Switch. For more information on how to define a WM-AD, see Chapter 8, "WM-AD configuration".
- Step 2 – Associate radios and change poll timeout to 15 seconds in WM-AD Assignment of Altitude AP default settings screen.
- Step 3 – Assign the Altitude APs to their home Summit WM Switch.
- Step 4 – Enable both the Summit WM Switches as an availability pair.
- Step 5 – Define a primary Summit WM Switch.
- Step 6 – Select one of the security mode options:
  - **Allow all Altitude APs to connect** – If the Summit WM Switch not recognize the Altitude AP's serial number, it sends a default configuration to the Altitude AP. If the Summit WM Switch recognizes the serial number, it sends the specific configuration (port and binding key) set to the Altitude AP.
  - **Allow only approved Altitude APs to connect** – If the Summit WM Switch does not recognize the Altitude AP's serial number, it prompts you to create a configuration. If the Summit WM Switch recognizes the serial number, it sends the configuration (port and binding key) to the Altitude AP.

This section is organized under the following sub-sections:

- Defining a WM-AD with the same SSID on both the Summit WM Switches
- Assigning radios to WM-AD, and changing the poll timeout value on Altitude AP configuration screen
- Assigning the Altitude APs to their home Summit WM Switch
- Enabling availability pair, defining primary Summit WM Switch, and selecting security mode
- Viewing the Altitude AP availability display
- Viewing the active Altitude APs report

9.2.1 Defining a WM-AD with the same SSID on both the Summit WM Switches

Step 1of the availability configuration process is to define WM-AD with the same SSID on both the Summit WM Switches

For information, see See Chapter 8, “WM-AD configuration”.

Note: You must use the same SSID on both the primary and the secondary Summit WM Switches.

9.2.2 Assigning radios to WM-AD, and changing the poll timeout value on Altitude AP configuration screen

Step 2 of the availability configuration process is to assign radios to the WM-AD, and changing the poll timeout value on Altitude AP configuration screen.

To assign radios to WM-AD and change the poll timeout value:

1. Login on both the Summit WM Switches.
2. From the main menu of the primary Summit WM Switch, click **Altitude AP Configuration**. The **Altitude A P Configuration** screen is displayed.
3. In the left pane, click **WAP Default Settings**. The default settings are displayed.
4. In the **WAP Properties** section, change the default value to 15 in the **Poll Timeout** text box.

   Note: The **Poll Timeout** value for availability must be 15.

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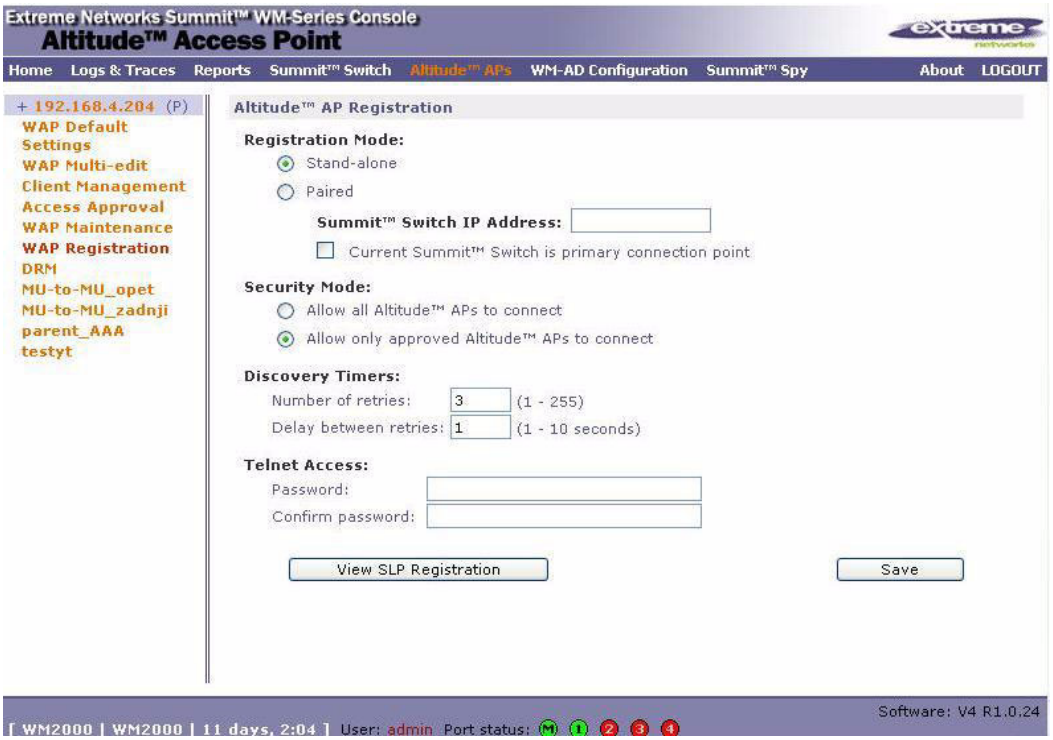
5. In the **WM-AD Assignment** section, select the WM-AD that you have defined for availability.
6. To assign b/g and a radios to the WM-AD, select the corresponding radio checkboxes.
7. To save your changes, click **Save**.
8. From the main menu of the secondary Summit WM Switch, click **Altitude AP Configuration**. The **Altitude AP Configuration** screen is displayed.
9. Repeat Step 3 to 7.

9.2.3 Assigning the Altitude APs to their home Summit WM Switch

Step 3 of the availability configuration process is to assign the Altitude APs to their home Summit WM Switch.

1. Login on both the Summit WM Switches.
2. From the main menu of the primary Summit WM Switch, click **Altitude AP Configuration**. The **Altitude AP Configuration** screen is displayed.
3. In the left pane, click **WAP**. The **WAP** screen is displayed.



4. In the **Registration Mode** section, click **Stand-alone**.
5. In the **Security Mode** section, click **Allow only approved Altitude APs to connect**.
6. From the main menu of the secondary Summit WM Switch, click **Altitude AP Configuration.** The **Altitude AP Configuration** screen is displayed.
7. Repeat Step 3 to Step 5.
8. From the main menu of the primary Summit WM Switch, click **Altitude AP Configuration**. The **Altitude AP Configuration** screen is displayed.
9. In the left menu, click **Access Approval**. The **Access Approval** screen is displayed.
10. Check the status of every Altitude AP and approve all those that should be connected to the primary Summit WM Switch.

Note: You must delete all such Altitude APs that are in pending state and you do not intend to approve them.

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11. From the main menu of the secondary Summit WM Switch, click **Altitude AP Configuration**. The **Altitude AP Configuration** screen is displayed.
12. Repeat Step 9 to Step 10.
13. To save your changes, click **Save**.

Note: After you have assigned Altitude APs to their home Summit WM Switch, you must check **Active Altitude APs Report** screen to ensure that all those approved APs are indeed connected to their home Summit WM Switch. For more information, see Section 9.2.6, “Viewing the active Altitude APs report”, on page 129.

9.2.4 Enabling availability pair, defining primary Summit WM Switch, and selecting security mode

Steps 4, 5 and 6 of the availability configuration process involve enabling availability pair, defining primary Summit WM Switch, and selecting security mode.

To enable the availability pair, define the primary Summit WM Switch, and select the security mode:

1. Login on both the Summit WM Switches.
2. From the main menu of the primary Summit WM Switch, click **Altitude AP Registration**. The **Altitude AP Registration** screen is displayed.
3. In the left pane, click **WAP Registration**. The **WAP Registration** screen is displayed.
4. In the **Registration mode** section, click **Paired**.
5. From the main menu of the secondary Summit WM Switch, click **Altitude AP Configuration**. The **Altitude AP Configuration** screen is displayed.
6. In the **Registration mode** section, click **Paired**.
7. From the main menu of the primary Summit WM Switch, click **Altitude AP Configuration**.
8. In the **Summit WM Switch IP Address** text box, type the IP address of the physical port of the secondary Summit WM Switch.
9. Select **Current Summit Switch is primary connection point**.
10. From the main menu of the secondary Summit WM Switch, click **Altitude AP Configuration**. The **Altitude AP Configuration** is displayed.

11. In the **Summit WM Switch IP Address**, type the IP address of the management port or physical port of the primary Summit WM Switch.
12. Clear the **Current Summit Switch is primary connection point** checkbox.
13. From the main menu of the primary Summit WM Switch, click **Altitude AP Configuration**. The **Altitude AP Configuration** screen is displayed.
14. In the **Security Mode**, select one of the security mode options. For more information, see page page 124.
15. To save your changes in the primary Summit WM Switch, click **Save**.
16. Open the **Altitude AP Configuration** of the secondary Summit WM Switch.
17. In the **Security Mode**, select one of the security mode options. For more information, see page page 124.
18. To save your changes in the secondary Summit WM Switch, click **Save**.

9.2.5 Viewing the Altitude AP availability display

The Altitude AP availability display provides the active connection state of an Altitude AP.

The display depicts the Altitude APs as color-coded boxes — Green and Red — on the screen:

- Green – The Altitude AP is configured on the Summit WM Switch and is currently connected.
- Red – The Altitude AP is configured on the Summit WM Switch but is currently not connected (not available to service this Summit WM Switch).

To view the Altitude AP availability display:

1. From the main menu, click **Reports & Display**. The **Reports & Displays** screen is displayed.
2. In the **List of Displays**, click **Altitude AP Availability**. The **Altitude AP Availability Display** appears.

9.2.6 Viewing the active Altitude APs report

To view the active Altitude APs:

1. From the main menu, click **Reports & Displays**. The **Reports & Display** screen is displayed.
2. In the **List of Displays**, click **Active Altitude APs**. The **Active Altitude APs** display appears.

9.3 Mobility overview

The Summit WM-Series WLAN Switch Software Solution allows multiple Summit WM Switches (up to 12) on a network to discover each other and exchange information about a client session. This feature enables a wireless device user to roam seamlessly between Altitude APs that are registered with separate Summit WM Switches.

The solution introduces the concept of a mobility manager and mobility agents; the concept requires designating one Summit WM Switch as the mobility manager and other Summit WM Switches as mobility agents.

The wireless device keeps the IP address, WM-AD assignment, and filtering rules it received from its home Summit WM Switch— the Summit WM Switch to which it was first connected.

The WM-AD on each Summit WM Switch must have the same SSID and RF privacy parameter settings for seamless roaming to occur.

The mobility manager and the mobility agents use the following two options for the discovery process.

- SLP with DHCP Option 78. The mobility agent on each Summit WM Switch will discover the address of the mobility manager using Option 78.
- Direct IP address option: Defined while configuring the mobility agent. By explicitly defining the manager's IP address while configuring the agents, enables the manager and agents to find each other directly without using the SLP discovery mechanisms.

Note: In order to provide tighter control of the registration steps for multi-domain installations, direct IP address definition option is recommended.

The mobility manager:

- Defines the registration behavior for a multi-Summit WM Switch mobility domain set:
  - Open mode – A new agent automatically registers itself with the mobility manager and immediately becomes part of the mobility domain.
  - Secure mode – The manager does not allow a new agent to automatically register. Instead, the connection with the new agent is placed in pending state until the administrator approves the connection.
- Listens for connection attempts from mobility agents.
- Establishes connection and sends a message to the mobility agent specifying the heartbeat interval and the IP address in **Mobility Permission List**.
- Sends regular Heartbeat messages containing wireless device session changes and waits for a return update message.

The agent:

- Uses SLP or a statically configured IP address to locate the manager.
- Uses the information from every heartbeat message received to update its own tables and updates the manager with the information on the wireless device users and data tunnels it is managing.

If a connection to a manager is lost:

- Agent to agent connections still remain active, allowing seamless roaming to continue.
- The data link between the agents remains active after the loss of the manager. The agents continue to use the last set of mobility location list to service known users.
    - Existing users – Remain in mobility scenario and if the users are known to mobility domain, they are able to continue roaming between the agents.
    - New users – Become local at the attaching agent. Roaming to another agents resets the session.
- Any user that roamed away from their home Altitude AP is terminated and must reconnect, re-authenticate and obtain a new IP address.

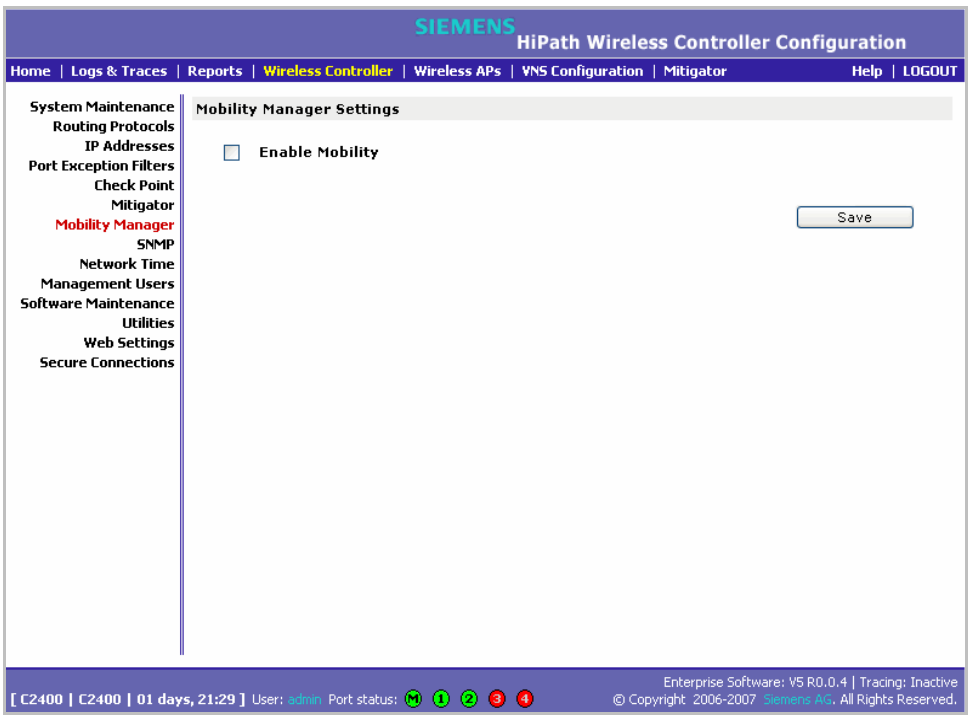
9.4 Configuring mobility

To configure mobility feature, you must define one Summit WM Switch as the mobility manager and other Summit WM Switches as mobility agents.

9.4.1 Configuring a Summit WM Switch as a mobility manager

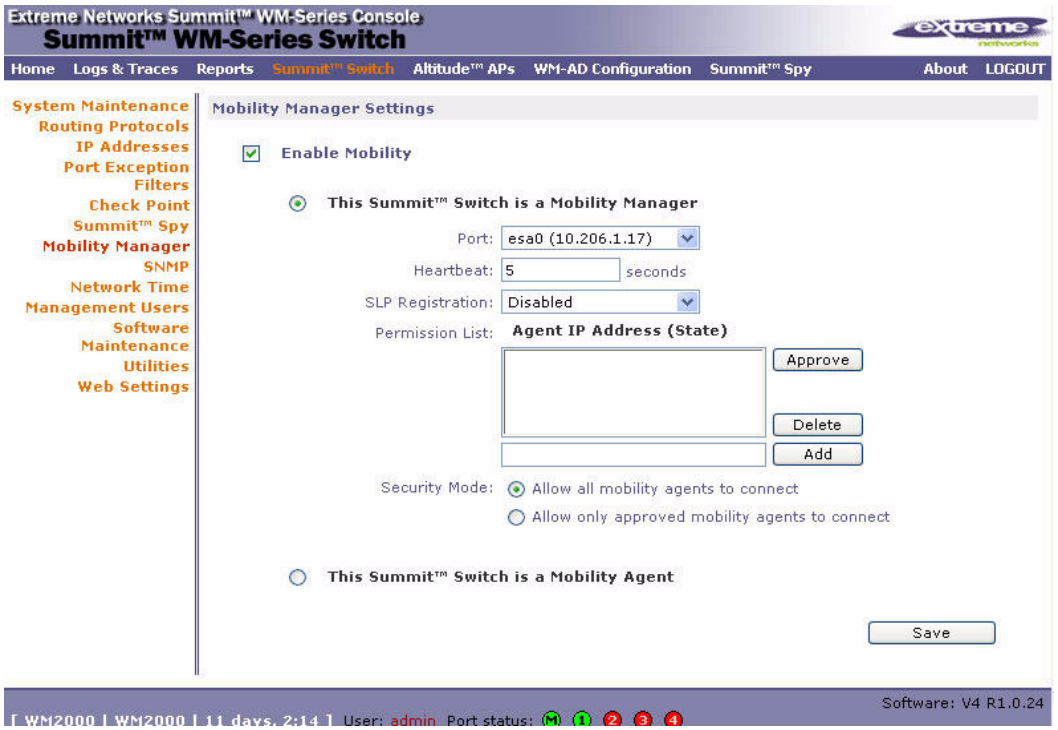
To configure Summit WM Switch as a mobility manager:

1. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration screen** is displayed.
2. In the left pane, click **Mobility Manager**. The **Mobility Manager Settings** screen is displayed.



Note: The **Mobility Manager** link is not displayed in the left pane with the **demo license**.

3. To enable mobility for this Summit WM Switch, select the **Enable Mobility** checkbox. The mobility options are displayed.



4. Select the **This Summit Switch is a Mobility Manager** option. The mobility manager options are displayed.
5. In the **Port** drop-down list, click the interface of the Summit WM Switch that is to be used as the mobility manager.

   Ensure that the selected interface is routable on the network.
6. In the **Heartbeat** text box, type the time interval (in seconds) at which the mobility manager sends a heartbeat message to the agent. The default is **5** seconds.
7. In the **SLP Registration** drop-down list, click one of the following:
   - **Enabled** – If you select **Enabled** in the **SLP Registration** drop-down list, the mobility agents discover the mobility manager with the help of SLP DA.
   - **Disabled** – If you select **Disabled** in the **SLP Registration** drop-down list, the mobility agents will use the static IP of the mobility manager for the mobility manager discovery.

If you select **Enabled** in the **SLP Registration** drop-down list, you must configure SLP on the network.

Note: If you have configured DHCP service in Windows 2003 server, you must make sure to enable **Option 78 SLP DA** in **Configure Options** window. For more information on how to configure Option 78 SLP DA, see Section 6.1.1, "Configuring DHCP in Windows 2003 Server", on page 61.

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8. In the **Add** text box, type the IP address of the Summit WM Switch mobility agent. The IP address is displayed in the **Permission List** box.

   You can add as many agents you want by repeating Step 8.

9. In the **Permission List** box, select the IP addresses you want to approve.
10. Click **Approve**. The IP addresses are approved.
11. In the **Security Mode** section, select either of the two options:

    - **Allow all mobility agents to connect** – A new agent automatically registers itself with the mobility manager and becomes part of the mobility domain.
    - **Allow only approved mobility agents to connect** – The manager does not allow a new agent to automatically register. Instead, the connection with the new agent is placed in pending state until the administrator approves it.

12. To save your changes, click **Save**.

9.4.2 Configuring Summit WM Switch as a mobility agent

To configure Summit WM Switch as a mobility agent:

1. From the main menu, click **Summit Switch Configuration**. The **Summit Switch Configuration** screen is displayed.
2. In the left pane, click **Mobility Manager**. The **Mobility Manager Settings** screen is displayed.
3. To enable mobility for this Summit WM Switch, select **Enable Mobility**. The mobility options are displayed.
4. Select **This Summit Switch is a Mobility Agent**. The mobility agent options are displayed.
5. In the **Port** drop-down list, select the interface of the Summit WM Switch that is to be used as the mobility agent.

   Ensure that the selected interface is routable on the network.

6. In the **Heartbeat** text box, type the time interval (in seconds) for which the mobility agent should wait for the connection establishment response before trying again. The default is 60.
7. In the **Discovery Method** drop-down list, select one of the following:
    - **SLPD** (Service Location Protocol Daemon) – Enables the discovery of mobility manager Summit WM Switch, using SLP. The mobility manager's address must be configured on the network using SLP when selecting this option.
    - **Static Configuration** – allows the mobility agent to discover the mobility manager without the SLP support.
        - If you select **Static Configuration**, **Mobility Manager Address** text box is displayed.
        - In the **Mobility Manager Address** text box, type the IP address of the Summit WM Switch that will serve as the mobility manager.
8. To save your changes, click **Save**.

9.4.2.1 Viewing the Mobility Manager display

If you have configured a Summit WM Switch as a mobility manager, two additional displays appear on the **Reports & Displays** screen:

- **Client Location in Mobility Zone**
- **Mobility Tunnel Matrix**

To view mobility manager display:

1. From the main menu, click **Reports & Displays**. The **Reports & Displays** screen is displayed.
2. Click the appropriate mobility manager display.
    - **Client Location in Mobility Zone** – Displays the active wireless clients and their status.

    You can perform the following actions on the **Client Location in Mobility Zone** display screen.
        - Sort this display by home or foreign Summit WM Switch.
        - Search for a client by MAC address, user name, or IP address.
        - Define the refresh rates for the display.
        - Export the information on the display screen as an .xml file

- **Mobility Tunnel Matrix** – Displays the state of inter-Summit WM Switch tunnels as well as the relative loading for user distribution across the mobility domain.

The **Mobility Tunnel Matrix** display provides the following information:

- Tunnel uptime
- Number of clients roamed (mobility loading)
- Local Summit WM Switch loading
- Mobility membership list

Both displays depict the state of the tunnels in color codes:

- Green – Indicates the mobility manager is in communication with an agent and the data tunnel has been successfully established.
- Yellow – Indicates the mobility manager is in communication with an agent but the data tunnel is not yet successfully established.
- Red – Indicates the mobility manager is not in communication with an agent and there is no data tunnel.

9.4.2.2 Viewing Mobility Agent display

If you have configured a Summit WM Switch as a mobility agent, an additional display — **Agent Mobility Tunnel Matrix** — appears on the **Reports & Displays** screen.

To view mobility agent display:

1. From the main menu, click **Reports & Displays**. The **Reports & Displays** screen is displayed.
2. Click **Agent Mobility Tunnel Matrix**. The mobility agent display screen appears.

   The mobility agent display depicts the number of mobility clients in each data tunnel and shows each tunnel's uptime in color codes:

   - Green – Indicates the mobility agent is in communication with the mobility manager and the data tunnel has been successfully established.
   - Yellow – Indicates the mobility agent is in communication with the mobility manager, but the data tunnel is not yet successfully established.
   - Red – Indicates the mobility agent is not in communication with the mobility manager and there is not data tunnel.

   In addition, the display also depicts the mobile clients' location information. You can look for a specific mobile client by MAC address, IP address, or user name.

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