HotPoint

Installation & Setup Guide

HotPoint 4000/5000 AP FWC2050 WLAN Controller

HotPoint 5200 MIMO Outdoor Access Point

HotPoint 5100 MIMO Indoor Access Point

FWC2050 Controller

HotPoint 4200 MIMO Outdoor Access Point

HotPoint 4100 MIMO Indoor Access Point

Manual Revision 2.0 2011-02-14
The contents of this Installation Guide are subject to change without notice.
Please refer to the Firetide partners web site, partners.firetide.com, for current versions.

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Safety Instructions

Firetide 5200 units must be installed by a qualified professional. Failure to install this equipment properly may result in equipment damage, personal injury, or death.

Explanation of Graphic Symbols

This symbol alerts the user to the presence of non-insulated dangerous voltage that may be of sufficient magnitude to constitute a risk of lethal electric shock to persons.

This symbol alerts the user to important operating, maintenance, and servicing instructions. Failing to comply with instructions may result in electrical shock.

This symbol alerts the user to the presence of important operating, maintenance, and servicing instructions. Failing to comply with this instruction may result in a hazard.

Do not open the cover

- Dangerous voltages inside.
- No serviceable parts inside.
- Refer to qualified service personnel.

Caution! Risk of electric shock!

POWER LINES CAN BE LETHAL

Do not install Firetide products where possible contact with power lines can be made. Antennas, poles, towers, guy wires, or cables may lean or fall and contact these lines. People may be injured or killed if they are touching or holding any part of equipment when it contacts electric lines. Make sure there is NO possibility that equipment or personnel can come in contact directly or indirectly with power lines.

ASSUME ALL OVERHEAD LINES ARE POWER LINES

The horizontal distance from a tower, pole or antenna to the nearest power line should be at least twice the total length of the pole/antenna combination. This will ensure that the pole will not contact power if it falls either during or after installation.

SURVEY THE SITE

Look over the entire site before beginning any installation and anticipate possible hazards. Never assume anything without checking it out for yourself! Don't take shortcuts!

TO AVOID FALLING, USE SAFE PROCEDURES WHEN WORKING AT HEIGHTS ABOVE GROUND

- Select equipment locations that will allow safe and simple installation.
- Don't work alone. A friend or co-worker can save your life if an accident happens.
- Don't attempt repair work when you are tired. Not only will you be more careless, but your primary diagnostic tool - deductive reasoning - will not be operating at full capacity.
- Use approved non-conducting ladders, shoes, and other safety equipment. Make sure all equipment is in good repair.
- If a tower or pole begins falling, don't attempt to catch it. Stand back and let it fall.
- If anything such as a wire or pole does come in contact with a power line, DON'T TOUCH IT OR ATTEMPT TO MOVE IT. Instead, save your life by calling the power company.
- Don't attempt to erect antennas or towers on windy days.
- MAKE SURE ALL TOWERS AND POLES ARE SECURELY GROUNDED, AND ELECTRICAL CABLES CONNECTED TO ANTENNAS HAVE LIGHTNING ARRESTORS. This will help prevent fire damage or human injury in case of lightning, static build-up, or short circuit within equipment connected to the antenna. The HotPoint access point has built-in lightning protection. Be sure that any other equipment connected to the HotPoint access point also has the same level of protection.
- The base of the antenna pole or tower must be connected directly to the building protective ground or to one or more approved grounding rods, using 10 AWG ground wire and corrosion-resistant connectors.
- Refer to the National Electrical Code for grounding details.

IF AN ACCIDENT SHOULD OCCUR WITH THE POWER LINES

- DON'T TOUCH THAT PERSON, OR YOU MAY BE ELECTROCUTED.
- Use a non-conductive dry board, stick, or rope to push or drag them so they no longer are in contact with electrical power.
- Once they are no longer contacting electrical power, administer CPR if you are certified.
- Immediately have someone call for medical help.

Table of Contents

Chapter 1 The MIMO HotPoint Family

The Firetide MIMO HotPoint Wireless Access Point System delivers a complete solution for indoor and outdoor wireless mesh networks. Firetide's MIMO HotPoint family consists of five components:

The FWC2050 Wireless LAN Controller: Each FWC2050 can control and manage up to 50 Firetide MIMO Access Points.

The HotPoint 5100 Indoor Access Point: A dual-radio system supporting 802.11a, b, g, and n modes. One radio operates on the 2.4 GHz band and the other on the 5 GHz band. Each 5100 is in a UL2043 plenum-rated enclosure.

The HotPoint 5200 Outdoor Access Point: A dual-radio system 802.11a, b, g, and n modes. One radio operates on the 2.4 GHz band and the other on the 5 GHz band. Each 5200 is in a NEMA 4X/IP67-rated cast aluminum enclosures and has a weatherproof Ethernet connector. The unit will accept PoE or an external power supply.

The HotPoint 4100 Indoor Access Point: A single-radio system supporting 2.4 or 5 GHz operation in 802.11a, b, and g modes.

The HotPoint 4200 Outdoor Access Point: A single-radio system supporting 2.4 or 5 GHz operation in 802.11a, b, and g modes.

To ease management of multiple access points in enterprise applications, a virtual AP model is offered. Each FWC2050 WLAN controller can support up to 8 'group' definitions, and each group supports 8 profiles per radio - 16 total. Almost any combination of groups and profiles can be applied to individual access points, making it easy to support multiple classes of users and applications on the same hardware.

Feature	5000	4000	Feature	5000	4000
WLAN Controller Support	Yes	Yes	Heat Maps	Yes*	Yes*
7000 series integrated mode	Yes	Yes	SNMP	No	No
Web UI-based configuration	Yes	Yes	WDS Server	Yes	No
VPN, Firewall	No	No	Walled Garden	No	No
URL Redirect-Captive Portal	Yes*	Yes*	HotView Pro	Yes	Yes
11n MIMO support	Yes	No	Rogue AP Detection	Yes*	Yes*
Modes of Operation	802.11abgn	802.11abg	RF Power Mgmt	Yes*	Yes*
Number of Clients	128	32	Number of VAPs	128	4
Policy mgmt - rate limit	Yes*	Yes*	Number of Radios	2	1
Automatic Channel Allocation	Yes*	Yes*	DHCP Server	Yes*	Yes

* Available only in conjunction with WLAN Controller.

Integration with Firetide HotPort Mesh Networks

In locations where access to Ethernet or power is limited, the HotPoint 4100, 4200, 5100 and 5200 can be paired with a HotPort 7000 Mesh Node for backhaul. The HotPort 7201/7202 Series is also capable of powering the HotPoint 5100/5200 Series.

Setting Up Your FWC2050

The FWC2050 can be set up in any indoor location, but the best option is to place the unit in the data center, wiring closet, or other location with access to UPS-protected power and the enterprise backbone network.

The FWC requires AC power and a wired Ethernet connection. Refer to the specifications section for details.

Figure 1. FWC2050 Controller

Setting Up Your Access Points

The HotPoint 4100 and 5100 can be installed in any indoor location. The location should be selected based on antenna and coverage plans - best RF performance is obtained with antennas connected directly to the HotPoint AP, or with short, good-quality cables.

The HotPoint 4200 and 5200 can be installed in any outdoor location. Again, location should be determined by antenna and coverage needs, not by Ethernet or power availability. The HotPoint 4200 has a built-in 2.4 GHz antenna, and it also has an N connector for an external 5 GHz antenna if required.

Figure 2. Firetide HotPoint 5100 Indoor and 5200 Outdoor MIMO Access Points

Figure 3. Firetide HotPoint 4100 Indoor and 4200 Outdoor Access Points

Chapter 2 Getting Started

System Requirements

The FWC2050 Controller, if used, must have layer 2 or layer 3 connectivity to all Firetide 4000 Series and 5000 Series Access Points.

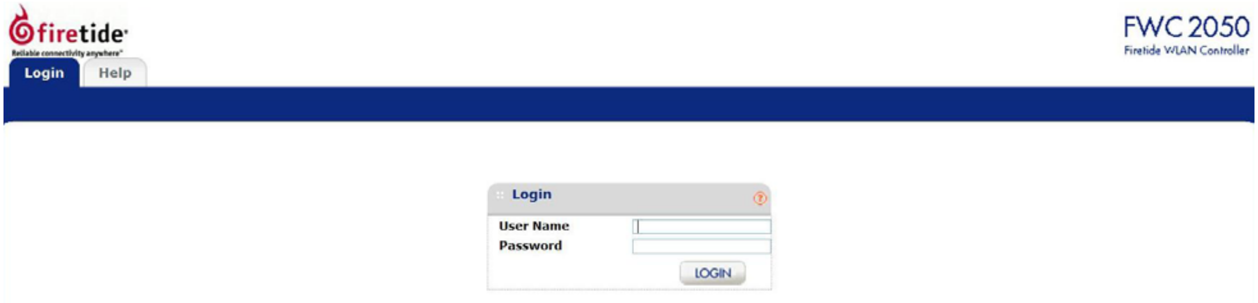
The system requires a DHCP server. If your network has one, it can be used. If desired, you can use the DHCP server built into the FWC2050.

HotPoint 5000 versus HotPoint 4000

There are few operation or configuration differences between systems based on the 5000 Series and the 4000 Series. Access Points can be mixed or matched to meet enterprise needs.

HotPoint 4000 Series do no support MIMO operation, and do not support DFS. HotPoint 4000 Series have only one radio per unit. They are otherwise essentially identical from a management and operational viewpoint.

Logging In



The default IP address for the FWC2050 is 192.168.224.250.

Log in to your FWC2050 Wireless Management System administrative interface for the first time at http://192.168.224.250, using the default username (admin) and password (password)

Firetide recommends that you change the user name and password, and the default IP address.

Chapter 3 Access Point Tab

Discovery

Firetide HotPoint 5000 Access Points can operate as stand-alone devices, or be associated with Firetide Wireless Controllers. Controller-based operation, called Managed Mode, offers many additional features, including roaming. The Controller can auto-discover and manage the access points in the same layer-2 domain, or across a layer-3 domain, but certain conditions must be met

Discovery for Initial Setup

New or factory-reset APs operate in stand-alone mode, unaware of the existence of the Controller. The Controller can discover these units as long as they are on the same layer-2 subnet. Once an AP is discovered, it switches into Managed Mode. APs in Managed Mode will look for a Controller whenever they reboot, using IP multicast.

Access Points in stand-alone mode (including any factory-reset APs) can only be discovered within the local subnet.

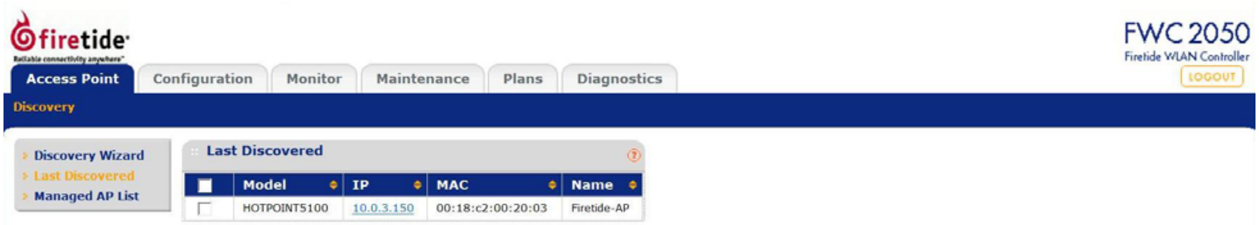
At the end of the discovery process, each discovered AP will be running a controller-based software image and will have attached itself to the controller that discovered it. It will be ready to accept client connections.

Re-Discovery

Once an AP has been discovered, it remains a Managed AP until it is factory reset. Managed APs will actively look for the Controller after a reboot. This process uses IP multicast, and can work across multiple subnets, if you enable multicast routing for address 224.0.100.250 between controller and the APs. Alternately, you can enable DHCP option 43 on the DHCP server and provide the controller's IP address. APs will get their address via this DHCP server and get the controller's IP as part of the option 43.

For the discovery process to work, the FWC 2050 and the APs must be running compatible firmware versions. Contact Firetide for details on firmware levels. In addition, DHCP service must be available, either from a system-wide DHCP server or via the DHCP service offered by the FWC2050.

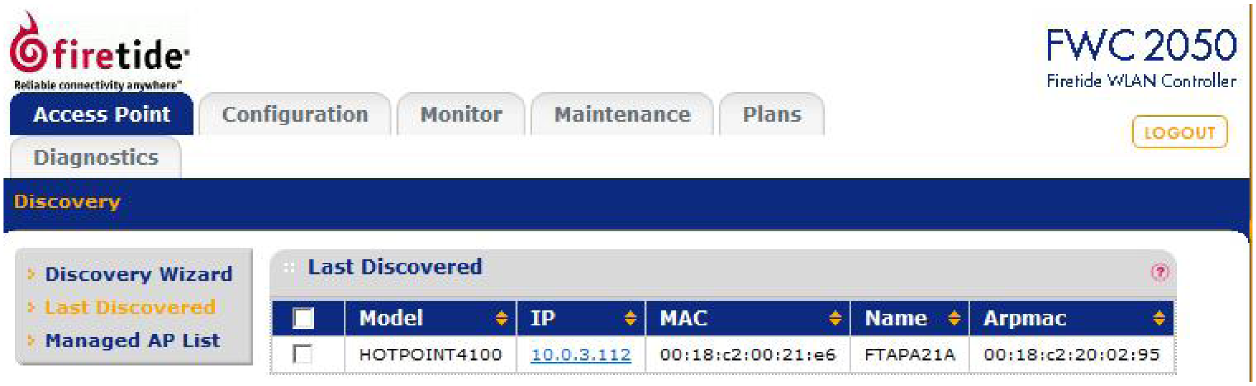
Last Discovered



Last Discovered

□	Model	IP	MAC	Name
□	HOTPOINT5100	10.0.3.150	00:18:c2:00:20:03	Firetide-AP

or



Last Discovered

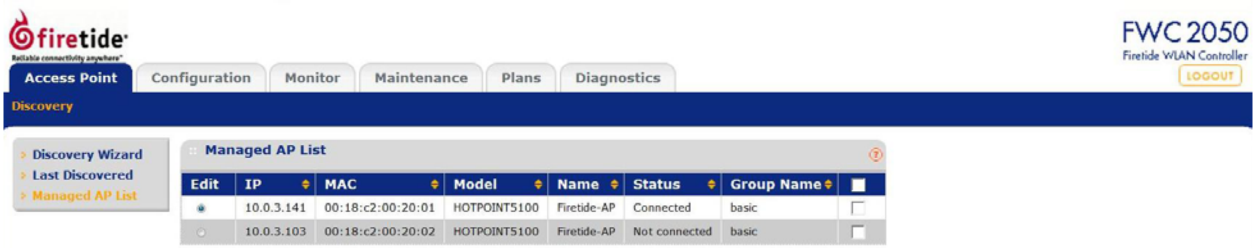
□	Model	IP	MAC	Name	Arpmac
□	HOTPOINT4100	10.0.3.112	00:18:c2:00:21:e6	FTAPA21A	00:18:c2:20:02:95

The results of the auto-discovery are shown in the "Last Discovered" page under Discovery menu. Access Points can also be added manually.

Configuration and Image Upgrade on the AP

After each reboot of an access point AP, the AP will look for its Controller, using multicast. Upon reconnecting, the AP and Controller will re-synchronize on firmware levels and AP settings. As part of this state machine, the AP will load any new firmware image posted to the controller. It will also synchronize to any configuration changes that were done on the controller while the AP was offline.

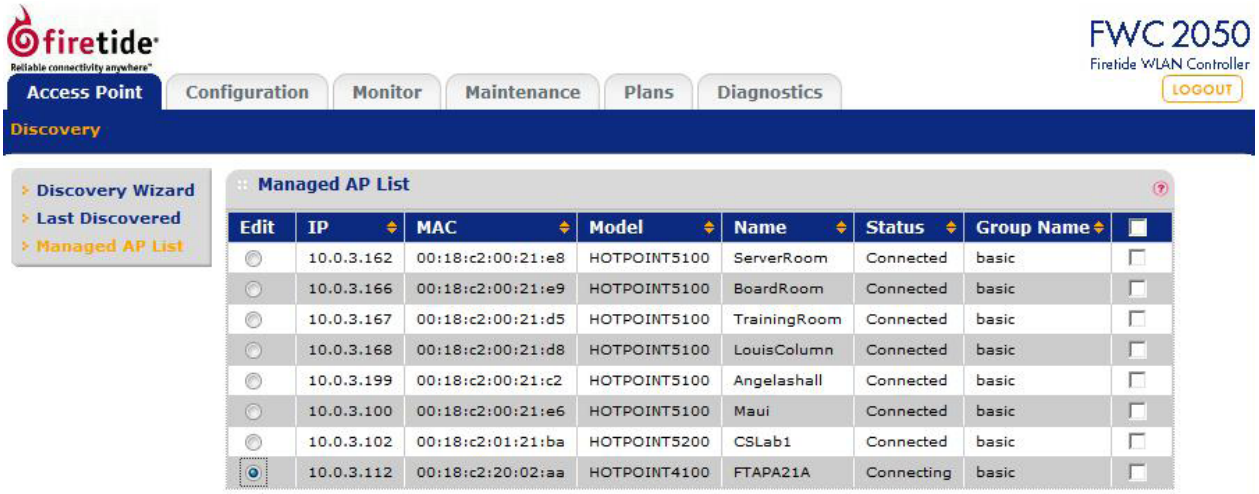
Managed AP List



Managed AP List

Edit	IP	MAC	Model	Name	Status	Group Name	□
●	10.0.3.141	00:18:c2:00:20:01	HOTPOINT5100	Firetide-AP	Connected	basic	□
○	10.0.3.103	00:18:c2:00:20:02	HOTPOINT5100	Firetide-AP	Not connected	basic	□

or



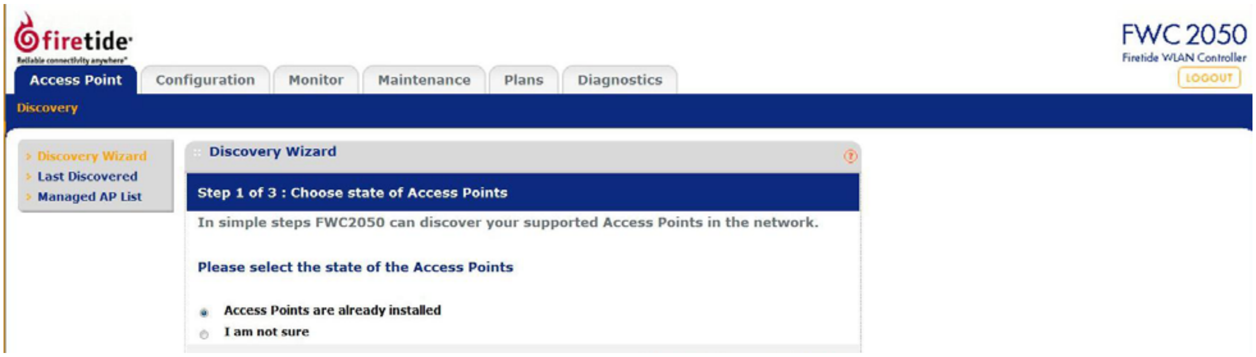
Managed AP List

Edit	IP	MAC	Model	Name	Status	Group Name	□
○	10.0.3.162	00:18:c2:00:21:e8	HOTPOINT5100	ServerRoom	Connected	basic	□
○	10.0.3.166	00:18:c2:00:21:e9	HOTPOINT5100	BoardRoom	Connected	basic	□
○	10.0.3.167	00:18:c2:00:21:d5	HOTPOINT5100	TrainingRoom	Connected	basic	□
○	10.0.3.168	00:18:c2:00:21:d8	HOTPOINT5100	LouisColumn	Connected	basic	□
○	10.0.3.199	00:18:c2:00:21:c2	HOTPOINT5100	Angelashall	Connected	basic	□
○	10.0.3.100	00:18:c2:00:21:e6	HOTPOINT5100	Maui	Connected	basic	□
○	10.0.3.102	00:18:c2:01:21:ba	HOTPOINT5200	CSLab1	Connected	basic	□
●	10.0.3.112	00:18:c2:20:02:aa	HOTPOINT4100	FTAPA21A	Connecting	basic	□

This displays a list of APs currently under management, and allows you to edit their settings.

Discovery Wizard

If all APs were not discovered, run the Discovery Wizard.



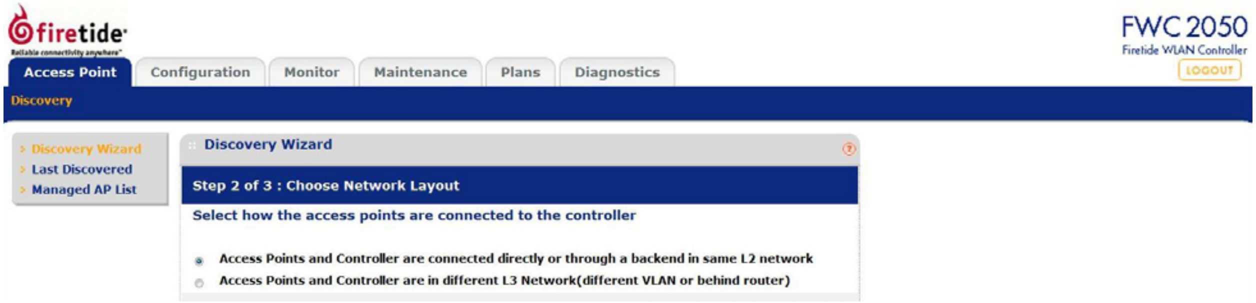
Discovery Wizard

Step 1 of 3 : Choose state of Access Points

In simple steps FWC2050 can discover your supported Access Points in the network.

Please select the state of the Access Points

● Access Points are already installed
○ I am not sure

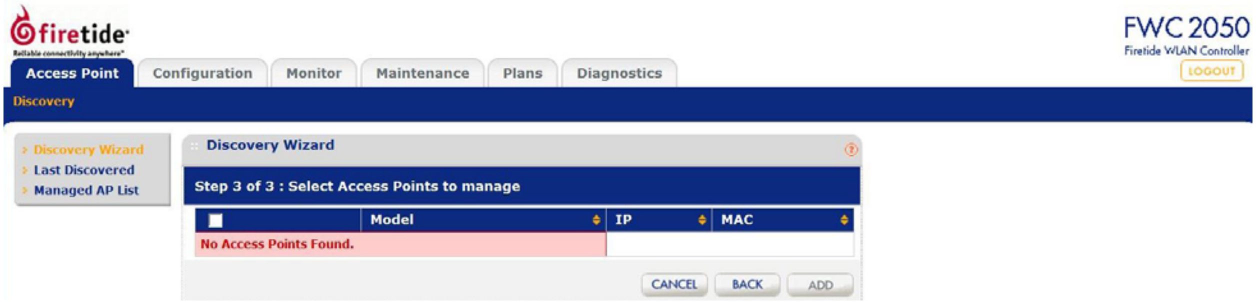


Discovery Wizard

Step 2 of 3 : Choose Network Layout

Select how the access points are connected to the controller

● Access Points and Controller are connected directly or through a backend in same L2 network
○ Access Points and Controller are in different L3 Network(different VLAN or behind router)



Discovery Wizard

Step 3 of 3 : Select Access Points to manage

□	Model	IP	MAC
No Access Points Found.			

Manual Additions

You will be asked to choose between two options:

Option 1 - Add new factory-defaulted APs: Add new factory defaulted AP. This option should be chosen during staging the process. Here the controller and APs are going to be taken out of the box and configured for deployment.

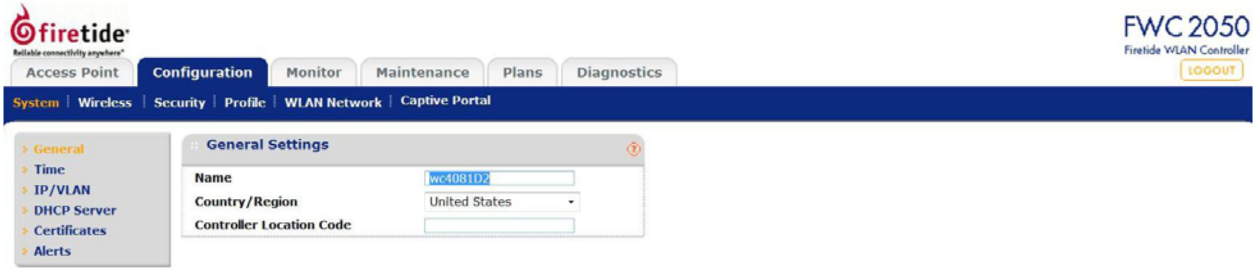
Option 2 - Add existing installed APs: Add existing installed APs. This option should be chosen in scenarios where APs are already deployed and running, and need to be attached to a controller. Depending upon the network topology, you may need to provide the controller with a range of IP addresses to search during discovery.

When the process finishes, you will be presented with a list of APs, their model numbers, their IP and their Ethernet MAC addresses. You can then choose the APs to be managed under this controller. Once this is done, the AP will be upgraded to the controller-based image.

Chapter 4 Configuration Tab

System Menu

General Settings



General Settings

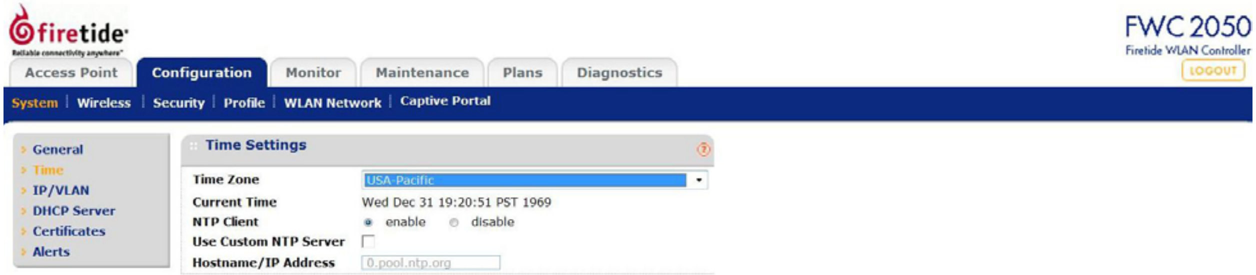
Name	wc4081D2
Country/Region	United States
Controller Location Code	

Name: This is the FWC2050 name. By default, the name is FWC2050. Firetide recommends changing the name as soon as possible after setting up. The name must contain only alphabets, numbers, and hyphens, and must be 31 characters or less.

Country/Region: This field displays the region of operation for the FWC2050 and the Access Points managed by the FWC2050. You must select a country or region.

Controller Location Code: This field defines the identifying code for the controller.

Time Settings



Time Settings

Time Zone	USA-Pacific
Current Time	Wed Dec 31 19:20:51 PST 1969
NTP Client	● enable ○ disable
Use Custom NTP Server	□
Hostname/IP Address	0.pool.ntp.org

This page lets you configure the time-related settings of your FWC2050 and managed Access Points.

Time Zone: Select the appropriate local time zone for your region or country.

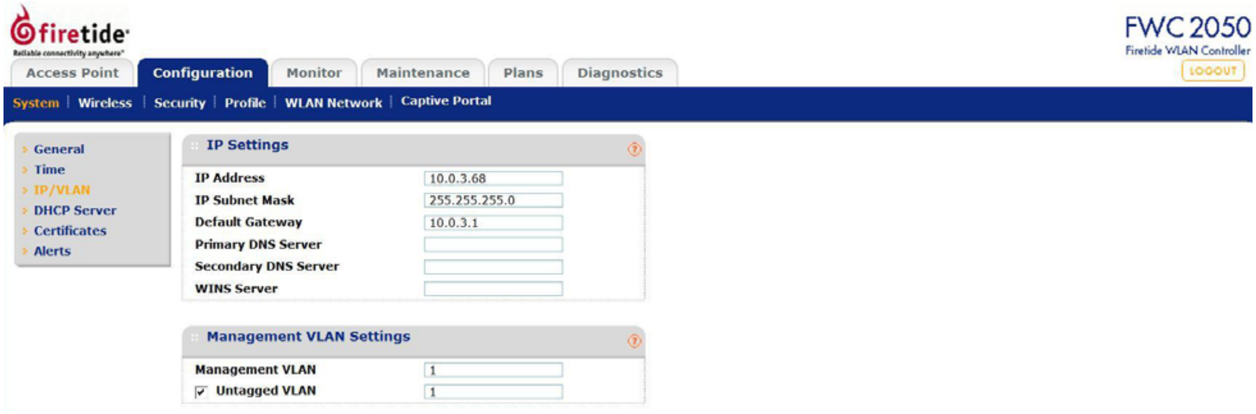
Current Time: Shows the current time. You cannot set the time; you must use an NTP server.

NTP Client: Defines the Network Time Protocol (NTP) server used to synchronize the clock of the FWC2050 and managed Access Points.

Use Custom NTP Server: Check this box if you wish to use an alternate NTP Server. By default, the Firetide NTP server (time.firetide.com) is used by the Access Point. Further information about NTP servers can be found at http://support.ntp.org/bin/view/Servers/WebHome

Hostname / IP Address: Provide the host name or IP address of the NTP server, if you are using a custom NTP server.

IP Settings



IP Settings

IP Address	10.0.3.68
IP Subnet Mask	255.255.255.0
Default Gateway	10.0.3.1
Primary DNS Server	
Secondary DNS Server	
WINS Server	

Management VLAN Settings

Management VLAN	1
☑ Untagged VLAN	1

This page lets you to configure the Management IP address setting of the FWC2050. It has the following options:

IP Address: This is the IP address of the FWC2050. The default IP address is 192.168.224.250. To change it, enter an available IP address from the address range used on your LAN.

IP Subnet Mask: Enter the subnet mask value used on your LAN. The default value is 255.255.255.0.

Default Gateway: Enter the IP address of the gateway for your LAN.

Primary DNS Server: Enter the IP address of the Primary Domain Name Server (DNS) that you want to use.

Secondary DNS Server: Enter the IP address of the Secondary Domain Name Server (DNS) that you want to use.

WINS Server: Enter the IP address of the WINS server that you want to use.

Management VLAN: Management VLANs are used for managing traffic (Telnet, SNMP, and HTTP) to and from the FWC2050 and managed Access Points. Frames belonging to the Management VLAN are not given any 802.1Q header when sent over the trunk. If a port is in a single VLAN, it can be untagged, but if the port needs to be a member of multiple VLANs, it must be tagged. The Management VLAN value must be between 1 and 4094.

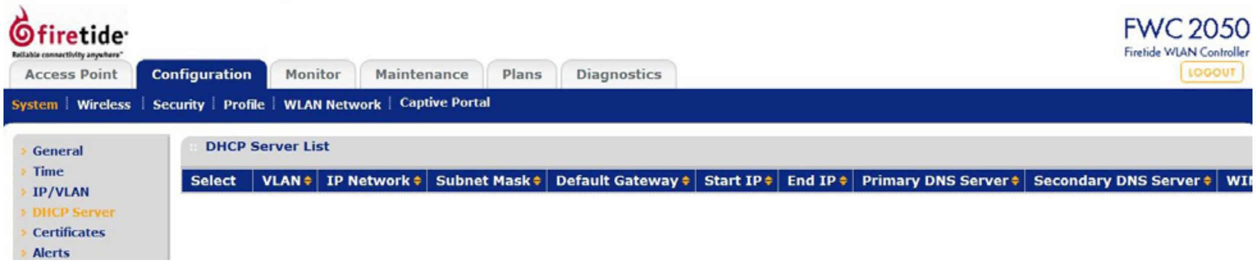
Untagged VLAN: When checked, this option allows one VLAN to be configured as an "untagged VLAN". When the FWC2050 sends frames associated with the untagged VLAN out the Ethernet interface, those frames will be untagged. When the FWC2050 receives untagged traffic from the Ethernet interface, those frames are assigned to the untagged VLAN.

If unchecked, the FWC2050 tags all outgoing Ethernet frames, and only accepts incoming frames that are tagged with known VLAN IDs.

Note: The untagged VLAN checkbox should only be unchecked if the hubs or switches on your LAN support the 802.1Q VLAN standard. Likewise, the untagged VLAN value should only be changed if the hubs and switches on your LAN support the 802.1Q standard.

Changing either of these values will result in a loss of IP connectivity if the hubs and switches on your network have not yet been configured with the corresponding VLANs.

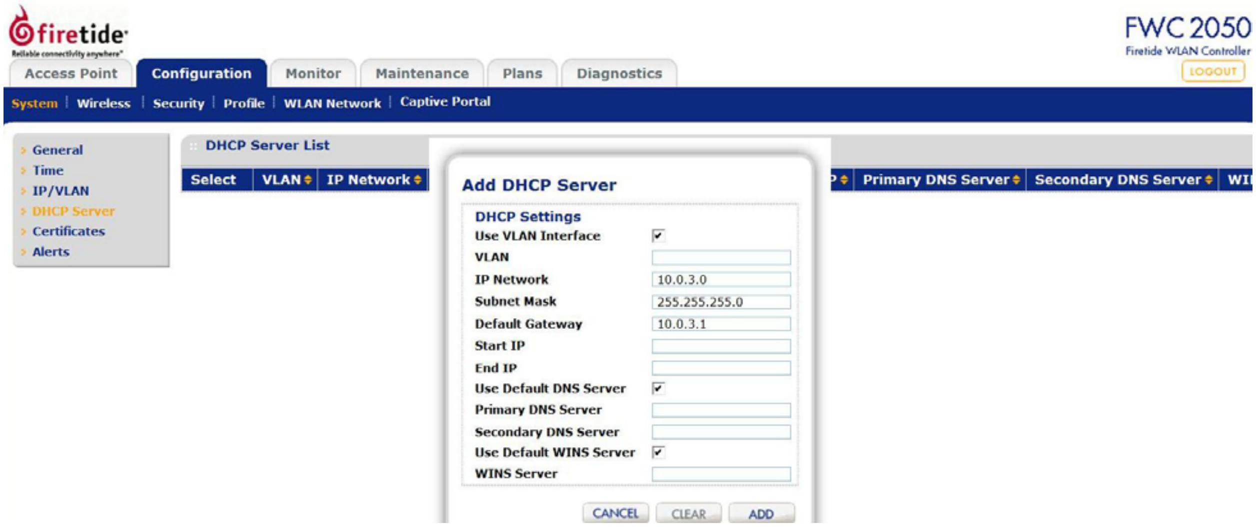
DHCP Server List



DHCP Server List

Select	VLAN	IP Network	Subnet Mask	Default Gateway	Start IP	End IP	Primary DNS Server	Secondary DNS Server	WI

Displays a list of DHCP Servers configured on the FWC2050.



Add DHCP Server

DHCP Settings

Use VLAN Interface	☑
VLAN	
IP Network	10.0.3.0
Subnet Mask	255.255.255.0
Default Gateway	10.0.3.1
Start IP	
End IP	
Use Default DNS Server	☑
Primary DNS Server	
Secondary DNS Server	
Use Default WINS Server	☑
WINS Server	

Use VLAN Interface: Enable this option to provide IP addresses to clients in a specified VLAN.

DHCP Server VLAN ID: Enter DHCP server VLAN ID. The VLAN ID range is between 1 and 4094.

IP Network: This option is enabled only when “Use VLAN Interface” is enabled. This provides the IP address for the FWC2050 in specified VLAN; when VLAN is not selected the FWC2050 management IP/VLAN is used.

Subnet Mask: Enter the subnet mask that will be assigned to clients by the Server.

Gateway IP Address: Enter the IP address of the default gateway.

Starting IP Address: Enter the starting IP address of the range that can be assigned by the Server.

Ending IP Address: Enter the ending IP address of the range that can be assigned by the Server.

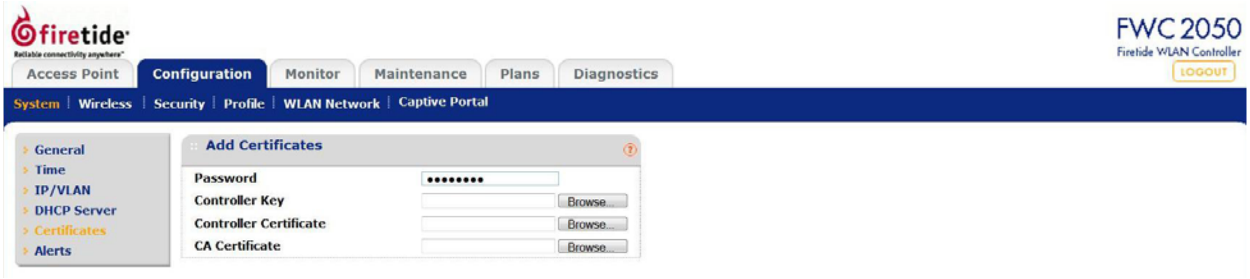
Use Default DNS Server: This option allows the FWC2050 DNS server to be provided to the clients of the specified VLAN.

Primary DNS Server: Enter the IP address of the primary DNS server for the network.

Secondary DNS Server: Enter the IP address of the secondary DNS Server for the network.

WINS: This displays WINS server configuration on the FWC2050 for all configured VLANs.

Certificates



Add Certificates

Password ••••••••
Controller Key Browse...
Controller Certificate Browse...
CA Certificate Browse...

This option lets you add security certificates to your system. There are three elements:

Password: Encrypts the Controller Key.

Controller Key: The private key used by the Controller to decrypt messages.

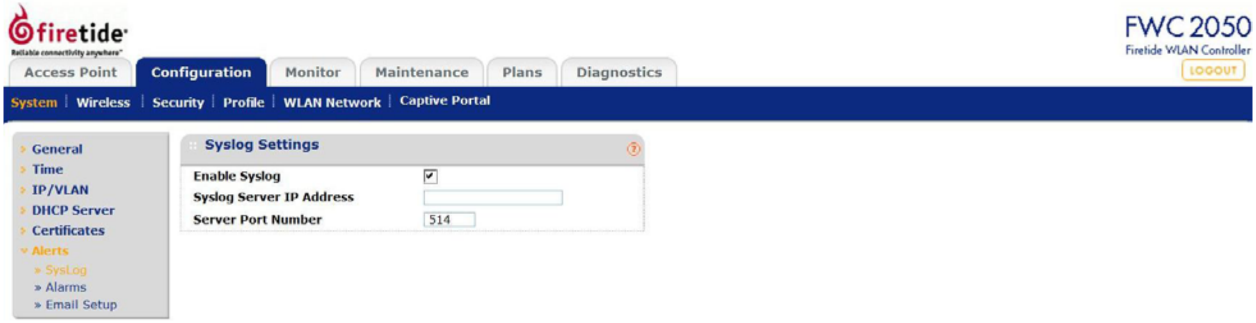
Controller Certificate: The public key of the Controller. The default key is signed by Firetide.

CA Certificate: The signed certificate of the Certificate Authority.

All keys and certificates are in PEM format.

Alerts

Syslog Configuration



Syslog Settings

Enable Syslog	☑
Syslog Server IP Address	
Server Port Number	514

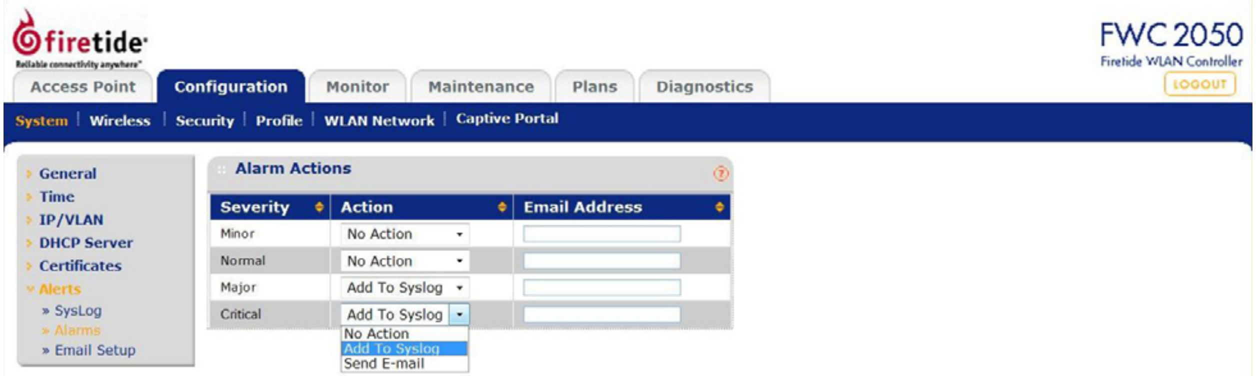
This page lets you configure the settings to connect to a Syslog server.

Enable Syslog: Enable the Syslog settings, if you have a Syslog server on your network.

Syslog Server IP Address: Enter the IP address to which the FWC2050 and managed Access Points will send all SysLogs, if SysLog option is enabled.

Port: Enter the port number at which your Syslog server is configured to listen to requests.

Alarm Actions

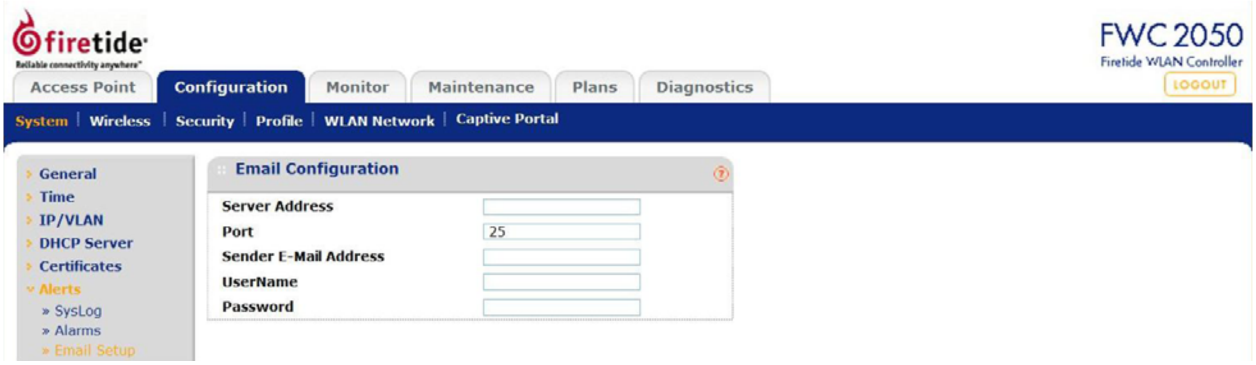


Alarm Actions

Severity	Action	Email Address
Minor	No Action	
Normal	No Action	
Major	Add To Syslog	
Critical	Add To Syslog	

This screen lets you define actions to be taken for the four defined alarm conditions. For each condition, you can do nothing, write to syslog, or generate an email to a defined email address.

Alarm Email Configuration



Email Configuration

Server Address	
Port	25
Sender E-Mail Address	
UserName	
Password	

Alarm messages via email require that a mail server be defined.

Server Address: Enter the address or name of the mail server (e.g. smtp.firetide.com)

Port: Enter the port on which the mail server receives mail.

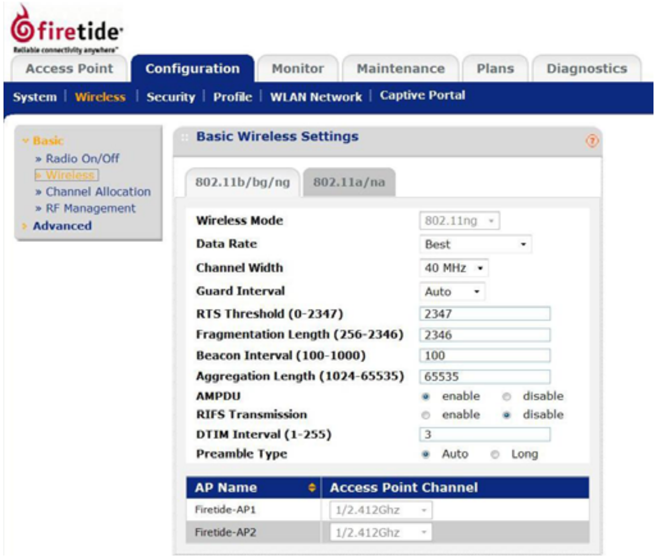
User Name: Enter the ‘user name’ that identifies the Controller that is sending the message.

Password: Enter the email system password defined for the account.

Wireless

Wireless - Basic and Advanced

Wireless Settings for Basic and Advanced are similar; except that Advanced allows you to configure settings per Group.

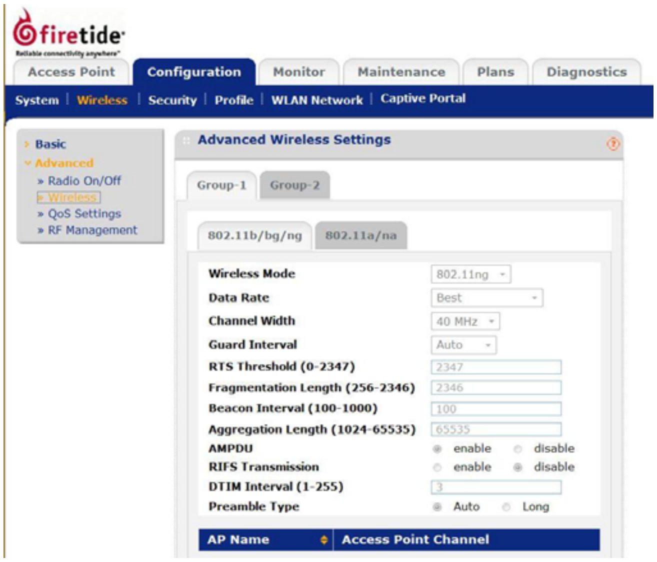


Basic Wireless Settings

802.11b/bg/ng | 802.11a/na

Wireless Mode	802.11ng
Data Rate	Best
Channel Width	40 MHz
Guard Interval	Auto
RTS Threshold (0-2347)	2347
Fragmentation Length (256-2346)	2346
Beacon Interval (100-1000)	100
Aggregation Length (1024-65535)	65535
AMPDU	● enable ○ disable
RIFS Transmission	○ enable ● disable
DTIM Interval (1-255)	3
Preamble Type	● Auto ○ Long

AP Name	Access Point Channel
Firetide-AP1	1/2.412Ghz
Firetide-AP2	1/2.412Ghz



Advanced Wireless Settings

Group-1 | Group-2

802.11b/bg/ng | 802.11a/na

Wireless Mode	802.11ng
Data Rate	Best
Channel Width	40 MHz
Guard Interval	Auto
RTS Threshold (0-2347)	2347
Fragmentation Length (256-2346)	2346
Beacon Interval (100-1000)	100
Aggregation Length (1024-65535)	65535
AMPDU	● enable ○ disable
RIFS Transmission	○ enable ● disable
DTIM Interval (1-255)	3
Preamble Type	● Auto ○ Long

AP Name	Access Point Channel

Wireless Mode: This option is enabled when Channel Allocation is disabled. In addition to the default 802.11ng mode, you can also choose 802.11b or 802.11bg. In 802.11bg mode, both 802.11n and 802.11g compliant devices can be used with the AP. If you select this option and other settings on this screen are disabled, select the Turn Radio On radio button to enable options on this screen.

Data Rate: This configuration specifies the rate of data frames from AP towards clients. Selecting any value other than best means that the rate will adapt up to the configured rate. Selecting a lower rate is helpful in scenarios where the radio environment is very noisy resulting in high bit errors. A lower rate may impact data throughput negatively.

Channel Width (11n): This configures the width of operation of the selected channel and is valid only in 802.11ng or 802.11na modes. The default value is 40 MHz. A wider channel improves the performance, but some legacy devices can only operate on either 20 MHz.

Guard Interval (11n): This is the interval between two consecutive symbols in a radio transmission. Legacy devices (802.11b or 802.11g) operate with a long guard interval while 802.11n devices can move between short and long. The default is Auto. Firetide recommends leaving this setting at Auto.

RTS Threshold: If the packet size is equal to or less than this threshold, the data frame is transmitted immediately. If the size is larger than the specified value, then the transmitter must send out an RTS packet, and then must wait for the receiving station to send back a CTS before sending the actual packet data.

Fragmentation Length: This is the maximum packet size used for fragmentation. Packets larger than this size will be fragmented. The Fragment Threshold value must be larger than the RTS Threshold value.

Beacon Interval: Sets the time period between transmissions of the AP beacon signal.

Aggregation Length: Specifies the maximum permitted length of aggregated frames.

AMPDU: Enables aggregation of several MAC frames into a single large frame to achieve higher throughput. Enabling AMPDU may sometimes lead to better network performance.

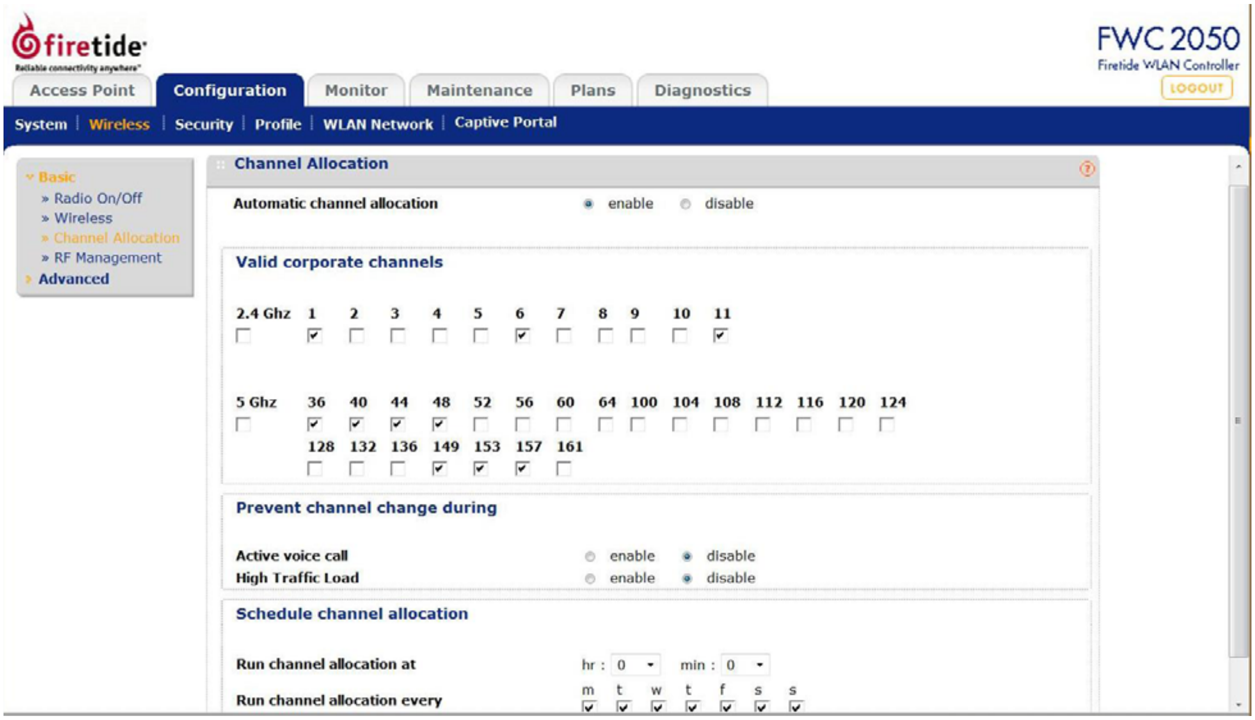
RIFS Transmission: Enables Reduced Interframe Space option. Enabling RIFS may lead to better network performance.

DTIM Interval: This sets the desired Delivery Traffic Indication Message or the data beacon rate. It indicates the message period in multiples of beacon intervals. This value must be between 1 and 255.

Preamble Type: Long transmit preambles provide a more reliable connection or longer range. Short transmit preamble gives better performance. Auto handles both long and short preambles. The default is Auto.

Access Point Channel: Each Managed Access Point channel can be individually selected. The Access Point mode is either set to the one enabled for the group, or, if the selected mode is not available on the Access Point, to the mode providing highest performance.

Channel Allocation



Channel Allocation

Automatic channel allocation ● enable ○ disable

Valid corporate channels

2.4 Ghz	1	2	3	4	5	6	7	8	9	10	11
□	☑	□	□	□	□	☑	□	□	□	□	☑

5 Ghz	36	40	44	48	52	56	60	64	100	104	108	112	116	120	124
□	☑	☑	☑	☑	□	□	□	□	□	□	□	□	□	□	□
	128	132	136	149	153	157	161								
	□	□	□	☑	☑	☑	□								

Prevent channel change during

Active voice call ○ enable ● disable
High Traffic Load ○ enable ● disable

Schedule channel allocation

Run channel allocation at hr : 0 min : 0

Run channel allocation every

m	t	w	t	f	s	s
☑	☑	☑	☑	☑	☑	☑

Automatic Channel Allocation (ACA), when run, tries to optimize the channel allocation for access points based on clients, user data traffic load and observed nearby RF environment of access points in order to reduce interference. The algorithm takes into consideration interference, traffic load on the AP and neighborhood maps to come up with the best channel for an Access Point. This information, collected over the last 24 hours, is used by the controller to determine the best possible channel for the Access Point.

For this reason, Automatic Channel Allocation should be re-run 24 hours (or more) after an initial deployment, so that the algorithm has a good base of performance data for analysis. You can also schedule the algorithm to run at a specified time, or periodically.

ACA can be configured to allow allocation of only the specified channels. This ensures that the Access Points only use the channels allowed according to Administration policies. ACA can also be configured to not change channels on any Access Point through which there is data traffic or voice-call traffic (identified by the traffic in WMM voice priority queues).

Recommendations

- Selecting non-overlapping channels for channel allocation is a good practice e.g. for 2.4 GHz use channels 1,6,11.
- Having channel allocation scheduled once a day allows better management of available bandwidth during the day. It is best to schedule at times when least number of clients are expected to be connected.

Automatic Channel Allocation: Enables this mode.

Valid Corporate Channels: Lets you select permitted channels. The first check box allows all channels to be for either 2.4GHz or 5GHz to be selected.

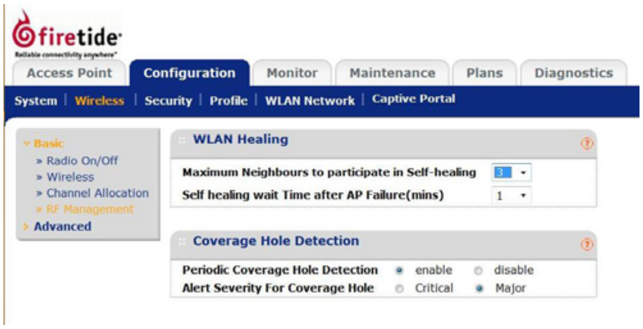
Prevent Channel Changing During: Lets you delay changes for certain critical traffic. Enabling “Active voice call” or “High Traffic Load” prevents a channel change on an Access Point if the respective condition is true.

Run Channel Allocation at: Specify at what time of the day the channel allocation can modify access point RF configuration.

Run Channel Allocation every: Specify weekly schedule for running channel allocation.

RF Management

Basic and Advanced RF Management settings are similar, but Advanced allows you to configure settings per Group.

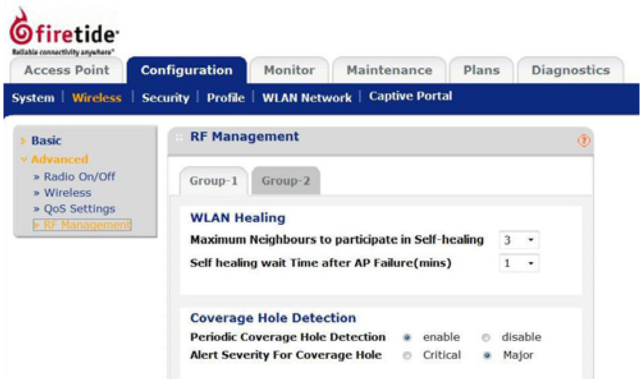


WLAN Healing

Maximum Neighbours to participate in Self-healing	3
Self healing wait Time after AP Failure(mins)	1

Coverage Hole Detection

Periodic Coverage Hole Detection	● enable	○ disable
Alert Severity For Coverage Hole	○ Critical	● Major



RF Management

WLAN Healing

Maximum Neighbours to participate in Self-healing	3
Self healing wait Time after AP Failure(mins)	1

Coverage Hole Detection

Periodic Coverage Hole Detection	● enable	○ disable
Alert Severity For Coverage Hole	○ Critical	● Major

Automatic WLAN Healing increases the transmit power of nearby Access Points to cover for an AP losing connection to the controller, or other loss. It works by periodically looking at the radio neighborhood maps and detecting any changes happening in the maps. This feature can be configured to wait for a specified time before any transmit power changes are done on neighboring Access Points to avoid short intermittent changes happening owing to surrounding environment. Configuration also allows selecting the number of neighboring Access Points which should increase Transmit power to cover for the down Access Point.

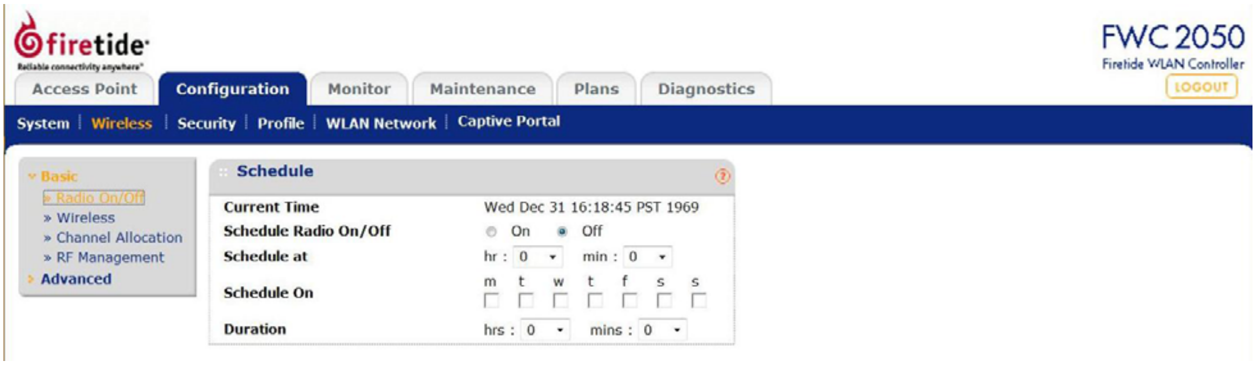
This feature is configured per Security Profile group and runs between the access points in the same group.

Maximum neighbors to participate in Self-Healing: Maximum Number of neighboring access points which increase or decrease power to cover for a failing Access Point. Selecting “0” disables this feature. The number of neighbors to participate in healing should not be very large. Three to four usually suffices in most deployments. This avoids too many access points located close to increase power for a single failed Access Point.

Self healing wait time after AP failure (in mins): Number of minutes to validate i.e. wait before confirming a failed Access Point and increasing transmit Power to cover the area. Self healing wait time should be configured to a value greater than AP reboot time usually two minutes. This allows for fluctuations in the power of nearby Access Points when Access Points are rebooted.

Radio On-Off Times

Radio On Settings can be set for the unit as a whole, or per Group.



Schedule

Current Time	Wed Dec 31 16:18:45 PST 1969
Schedule Radio On/Off	○ On ● Off
Schedule at	hr : 0 min : 0
Schedule On	m □ t □ w □ t □ f □ s □ s □
Duration	hrs : 0 mins : 0

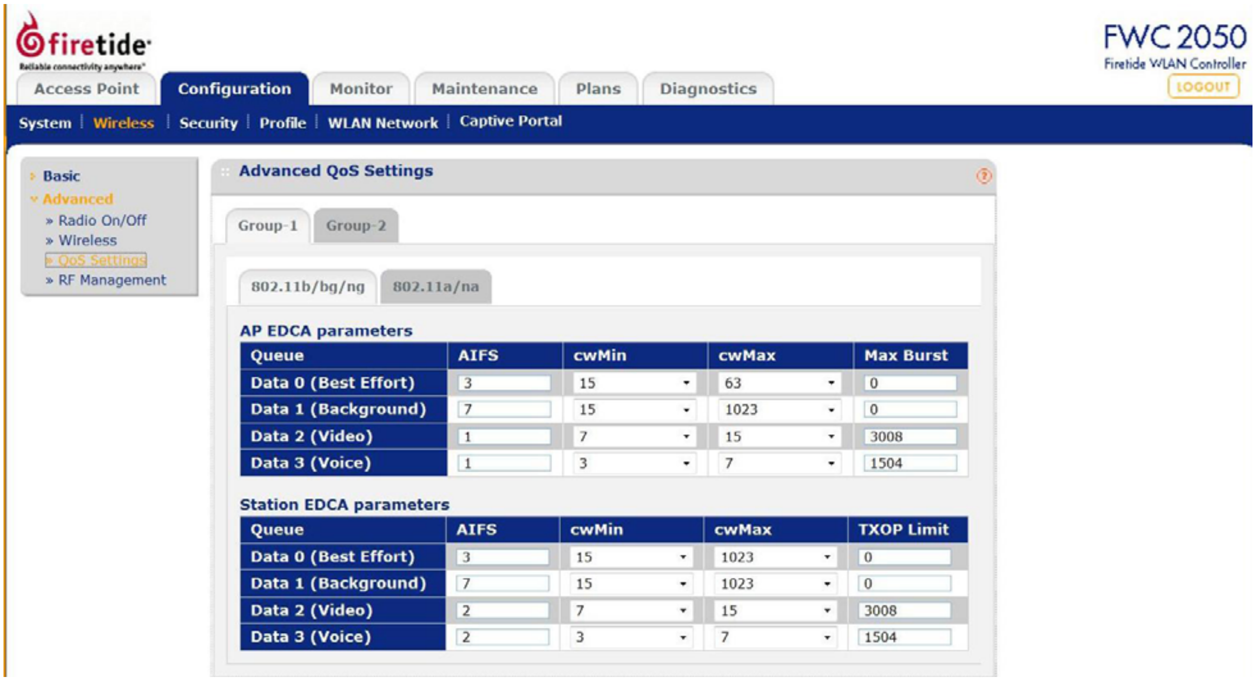
Current Time: Enter the correct current time. If NTP service is enabled, this field displays the local time.

Schedule Radio On/Off: Enables and disables this feature.

Schedule at: Specifies the time.

Schedule On: Specifies the days of the week.

Duration: Specifies the length of on time.



Advanced QoS Settings

AP EDCA parameters

Queue	AIFS	cwMin	cwMax	Max Burst
Data 0 (Best Effort)	3	15	63	0
Data 1 (Background)	7	15	1023	0
Data 2 (Video)	1	7	15	3008
Data 3 (Voice)	1	3	7	1504

Station EDCA parameters

Queue	AIFS	cwMin	cwMax	TXOP Limit
Data 0 (Best Effort)	3	15	1023	0
Data 1 (Background)	7	15	1023	0
Data 2 (Video)	2	7	15	3008
Data 3 (Voice)	2	3	7	1504

QoS settings on the access point control downstream traffic flowing from the AP to client (AP EDCA parameters) and the upstream traffic flowing from the client to the AP (station EDCA parameters).

Data 3 (Voice): The highest priority queue, minimum delay; ideal for VOIP and streaming media.

Data 2 (Video): The second highest priority queue, low delay. Video applications are routed to this queue.

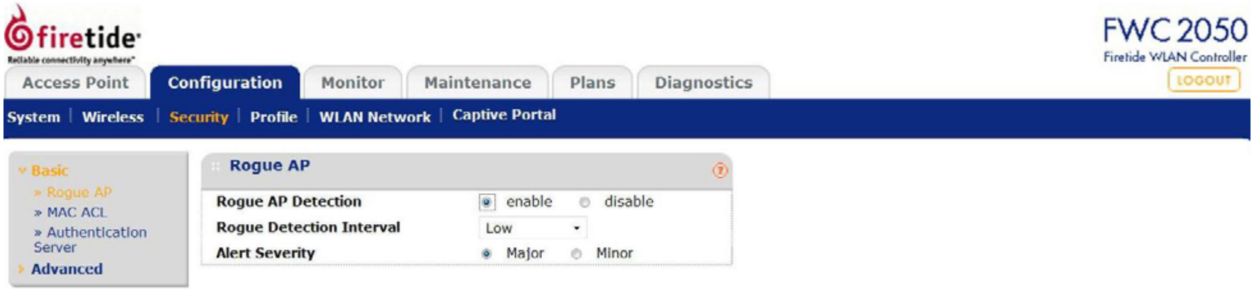
Data 1 (Background): Low priority queue with high throughput. Applications which are not time-sensitive but require high throughput can use this queue.

Data 0 (Best Effort): The medium priority queue, medium delay. Most IP applications use this queue.

Security

Basic

Rogue AP Detection



Rogue AP

Rogue AP Detection ● enable ○ disable

Rogue Detection Interval Low

Alert Severity ● Major ○ Minor

Unidentified access points that use the SSID of a legitimate network can present a serious security threat. Detecting rogue access points involves scanning the wireless environment on all available channels, looking for unidentified access points. These settings are applied to all managed APs.

An AP is defined as rogue if all of the following are true:

1. AP's Radio BSSID is observed by any of the managed APs,
2. AP is seen transmitting on the Ethernet side on the same L2 as the APs.
3. At least one client is connected to the AP.

Any AP not meeting all of the conditions above is classified as a neighbor. Neighbor APs can be rogue; until a client connects it is not possible to determine whether the AP is rogue or not.

Neighbor APs as well as rogue APs will be detected and maintained in the controller. The controller also maintains current count of the rogue APs as well rogue APs seen in the last 24 hours. All Neighbor as well as rogue APs will be displayed, up to a maximum of 512 APs.

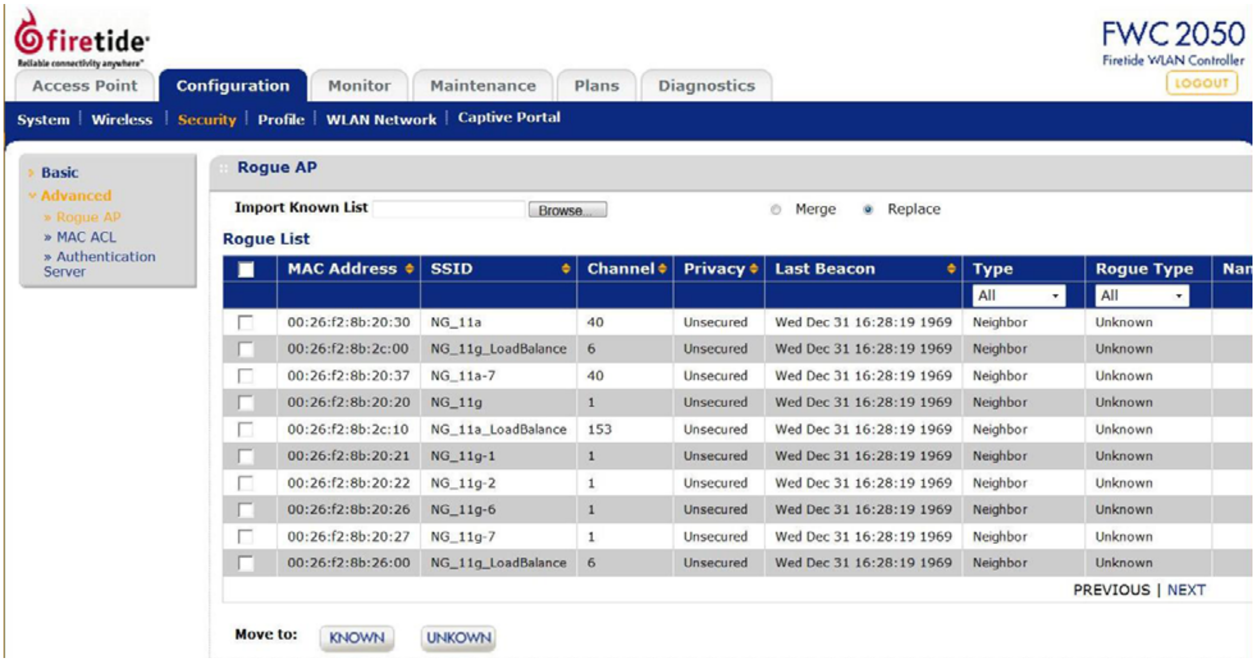
Neighbor and rogue APs are detected by scanning, and the AP is off-channel during this time. Because the detection interval is long, it will take at least one such interval (and possibly more) for a rogue or neighbor AP to be detected and appear.

Rogue AP Detection: Disabled by default.

Rogue Detection Interval: The interval at which Rogue Detection required on run on FWC2050. The default Rogue Detection Interval is "Low".

Alert Severity: Sets the severity of the alarm when Rogue APs are detected.

This is a sample rogue and neighbor screen:



Import Known List ○ Merge ● Replace

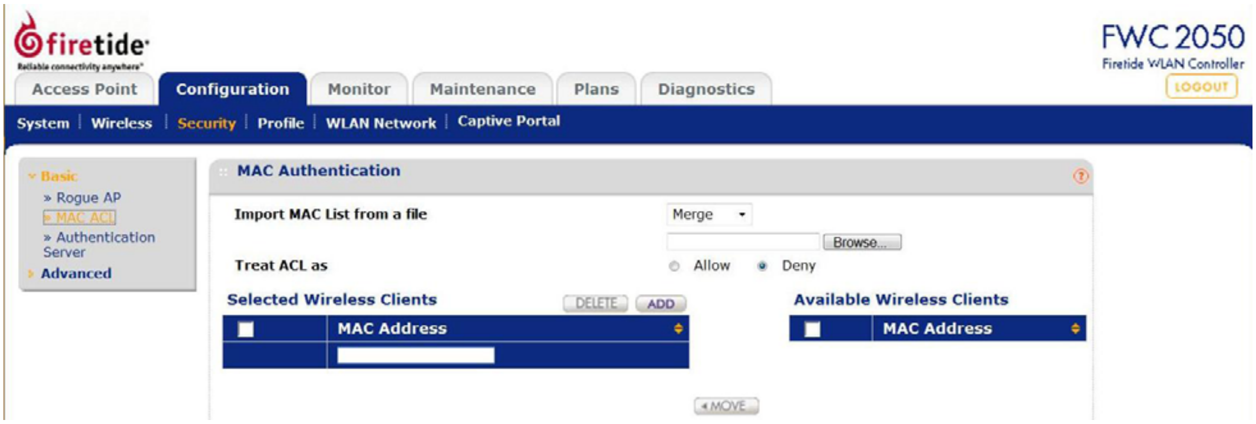
Rogue List

□	MAC Address	SSID	Channel	Privacy	Last Beacon	Type	Rogue Type	Nar
						All	All	
□	00:26:f2:8b:20:30	NG_11a	40	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:2c:00	NG_11g_LoadBalance	6	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:20:37	NG_11a-7	40	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:20:20	NG_11g	1	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:2c:10	NG_11a_LoadBalance	153	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:20:21	NG_11g-1	1	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:20:22	NG_11g-2	1	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:20:26	NG_11g-6	1	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:20:27	NG_11g-7	1	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	
□	00:26:f2:8b:26:00	NG_11g_LoadBalance	6	Unsecured	Wed Dec 31 16:28:19 1969	Neighbor	Unknown	

Move to:

MAC Address Access Control Lists

MAC ACL Restrictions can be applied to the unit, or per Group.



MAC Authentication

Import MAC List from a file: Merge

Treat ACL as: ○ Allow ● Deny

Selected Wireless Clients

□	MAC Address

Available Wireless Clients

□	MAC Address

Import MAC List from file: Allows you to import a list of MAC addresses.

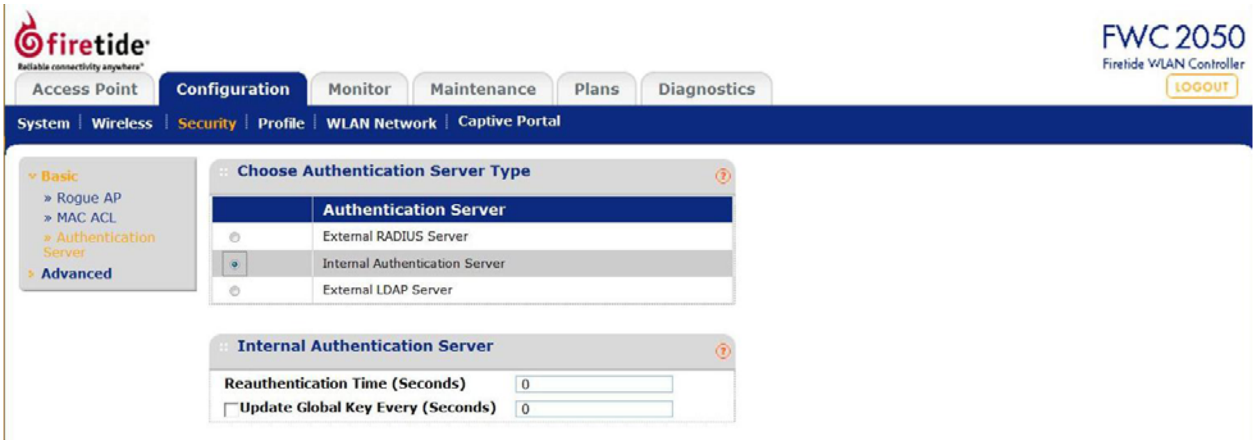
Treat ACL as: Lets you specify whether the imported list is allow or deny.

Selected Wireless Stations: This table lists the stations that have been allowed access to the network through this Access Point. Click **Delete** to delete a wireless station from the Selected wireless clients table list. Enter a MAC address and Click **Add** to add the MAC address of the wireless stations to the Selected wireless clients table list.

Available Wireless Stations: This table lists the Wireless stations that are present in the vicinity of the Access Point. Click **Refresh** to update this list in the table. Select a station in the Available Wireless Stations table and click **Move** to move the station to the Selected wireless clients table.

Authentication Server Selection

This lets you select one of three authentication servers.



Choose Authentication Server Type

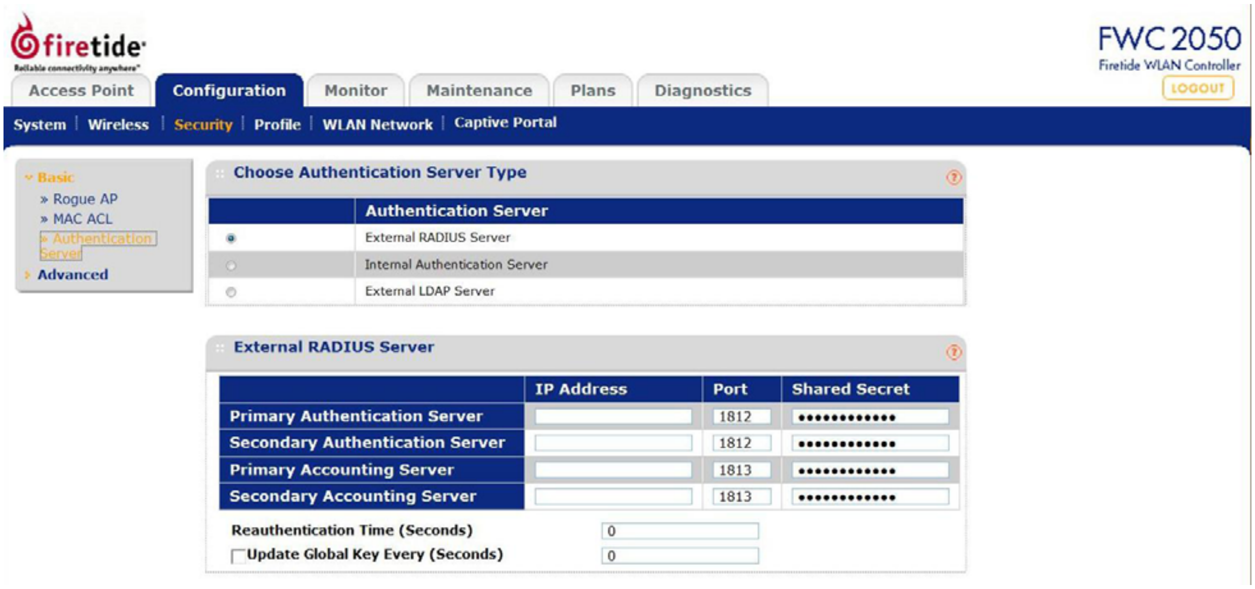
	Authentication Server
○	External RADIUS Server
●	Internal Authentication Server
○	External LDAP Server

Internal Authentication Server

Reauthentication Time (Seconds): 0

□ Update Global Key Every (Seconds): 0

Configuring a RADIUS Authentication Server



Choose Authentication Server Type

	Authentication Server
●	External RADIUS Server
○	Internal Authentication Server
○	External LDAP Server

External RADIUS Server

	IP Address	Port	Shared Secret
Primary Authentication Server		1812	•••••••••••••
Secondary Authentication Server		1812	•••••••••••••
Primary Accounting Server		1813	•••••••••••••
Secondary Accounting Server		1813	•••••••••••••

Reauthentication Time (Seconds) 0

□ Update Global Key Every (Seconds) 0

Primary Authentication Server: The Primary Authentication Server is the main Radius server used for authentication. The IP Address, Port, and Shared Secret information is required to communicate with Radius Server. The Shared Secret is shared between the Wireless Access Point and the Radius Server while authenticating the Wireless client.

Secondary Authentication Server: A Secondary Authentication Server can be configured for use if the Primary Authentication Server fails or is unreachable. The IP Address, Port, and Shared Secret information is required to communicate with the Radius Server. The Shared Secret is shared between the Wireless Access Point and the Radius Server while authenticating the Wireless client.

Primary Accounting Server: The Primary Accounting Server is used for accounting on the network. The IP Address, Port No., and Shared Secret information is required to communicate with Radius Server. The Shared Secret is shared between the Wireless Access Point and the Radius Server while authenticating the Wireless client.

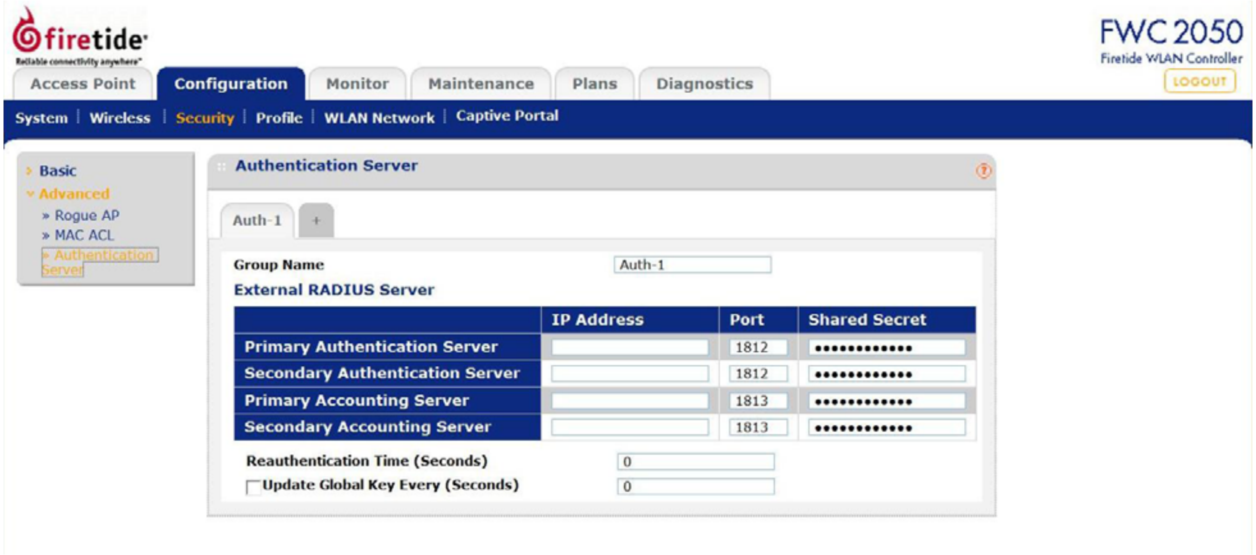
Secondary Accounting Server: A Secondary Accounting Server can be configured to use if the Primary Authentication Server fails or is unreachable. The IP Address, Port No., and Shared Secret information is required to communicate with Radius Server. The Shared Secret is shared between the Wireless Access Point and the Radius Server while authenticating the Wireless client.

Re-authentication Time (Seconds): This is the time interval in seconds after which the supplicant will be authenticated again with the RADIUS Server. The default interval is 3600 seconds.

Update Global Key Every (Seconds): Enable this option to have the Global Key changed according to the time interval specified. If enabled, enter the desired time interval. The default is enable, and the default interval is 1800 Seconds.

Configuring RADIUS per Group

RADIUS server parameters can also be configured per Group. Settings are the same as for a system-wide RADIUS server.



Group Name: Auth-1

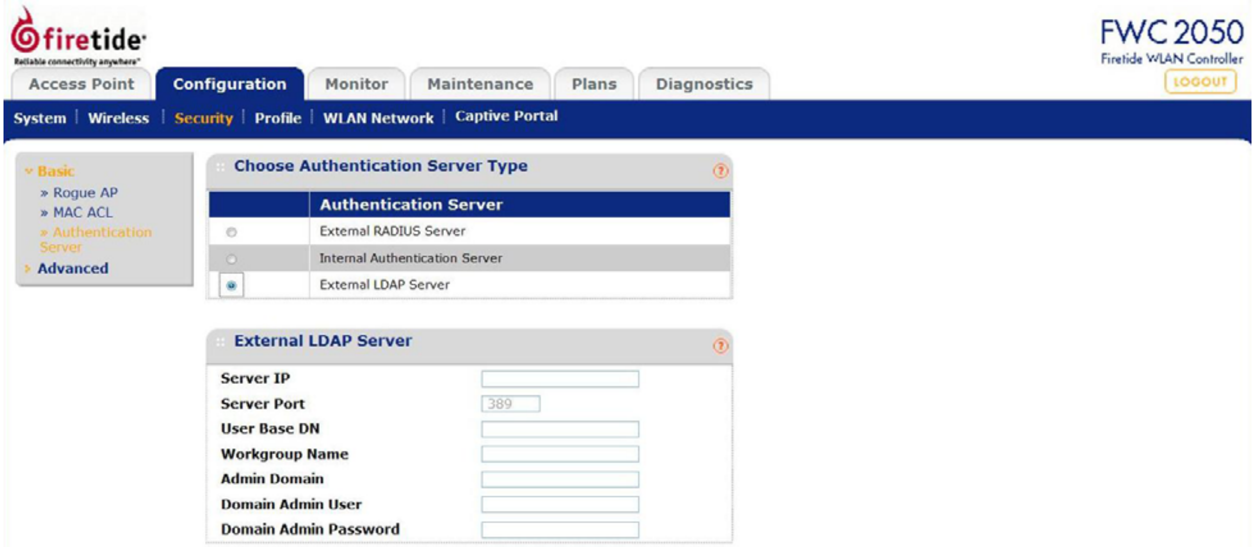
External RADIUS Server

	IP Address	Port	Shared Secret
Primary Authentication Server		1812	•••••••••••••
Secondary Authentication Server		1812	•••••••••••••
Primary Accounting Server		1813	•••••••••••••
Secondary Accounting Server		1813	•••••••••••••

Reauthentication Time (Seconds): 0

□ Update Global Key Every (Seconds): 0

Configuring an LDAP Authentication Server



Choose Authentication Server Type

	Authentication Server
○	External RADIUS Server
○	Internal Authentication Server
●	External LDAP Server

External LDAP Server

Server IP	
Server Port	389
User Base DN	
Workgroup Name	
Admin Domain	
Domain Admin User	
Domain Admin Password	

Server IP: Enter the LDAP Server IP address.

Server Port: Enter the server's port number.

User Base DN: Enter the DN for the base of users.

Admin Domain: Defines the administrative domain.

Domain Admin User: User name for administering domain.

Domain Admin Password: Password for Domain Admin User.