WiDirect

USER MANUAL

All Appliance Models

Software Release 1.5

By:

ALLCITY
WIRELESS

Table of Contents

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Revision History

Rev	**Date**	**Editor**	**Description**
1.0	11/11/2007	JLB	Initial Draft
1.01	11/23/2007	JLB	Minor Formatting Edits
1.02	12/19/2007	JLB	minor edits
1.3	10/25/2008	DV	Updated for version 1.3.1
1.3.2	3/5/2010	PM	Updated for all Hardware
1.5	11/23/2010	DV	Updated for version 1.5

Preface: About This Manual

This manual is written for system administrators, system integrators, network administrators and others who use the WiDirect appliance. The WiDirect models span a broad spectrum of possible applications. The product can be used to manage wire line and wireless networks, both local and remote. The WiDirect line is split into two classifications, Auth Server and Client. All networks initially require a WiDirect Auth Server which has the ability to function independently. Through WiDirect Client Management Service (WCMS) clients can be added to expand the network size, both from user processing and to expand in different geographic locations. The smaller models are appropriate for small office applications and local WISP applications. Larger models can manage common carrier network environments. Each WiDirect unit contains the same software and most of the features are available for use in each model, most notable differences pertain to embedded firmware and Micro model line. The feature set within the WiDirect appliance is broad and is expected to continue to grow over time. These features provide significant capabilities that create a network infrastructure, one that can be used in numerous creative ways depending on the environment.

If you are installing a WiDirect for the first time, you should read this entire manual in order to become familiar with the settings and tools. However, the steps to actually install and configure a new WiDirect box begin with *Section 3: Installation.*

1 WiDirect Administration Interface

1.1 Logging In

In order to gain initial access to the WiDirect's web based GUI, a cross-over cable can be connected to the ETH1 (Ethernet 1) interface to another computer such as a laptop. Once physically connected, the WiDirect provides the other machine with an IP address in the 10.4.1.0/24 subnet via DHCP. (Be sure that the connecting computer is configured for DHCP to receive the IP address.)

Once the IP address has been established, open a web browser such as Firefox, and open the following URL:

http://10.4.1.1/portal/admin

This URL opens the WiDirect Admin login page. To login, use the preconfigured username of ***admin*** and the password ***widirect***.

Note: If the IP address of Eth1 has changed from the default, use the new IP address instead of 10.4.1.1.

WARNING: For security reasons, if a user fails to enter the proper login credentials three times in a row, their IP address will be banned from the login page for fifteen minutes. After fifteen minutes has passed, they'll be able to attempt another login.

1.2 System Status Menu

The system status menu is the first menu that is located in the left hand navigation bar of the WiDirect web GUI.

1.2.1 Home

The ***Home*** button, which is located in the top left hand corner of the administrator page, returns the user to the home screen. This is the same page that is displayed upon first logging into the WiDirect. The home page gives a quick status on the number of users that are currently connected to the WiDirect.

1.2.2 Active Users

The *Active Users* page as shown in Figure 1-1 displays all the information about users that are currently connected to the WiDirect.

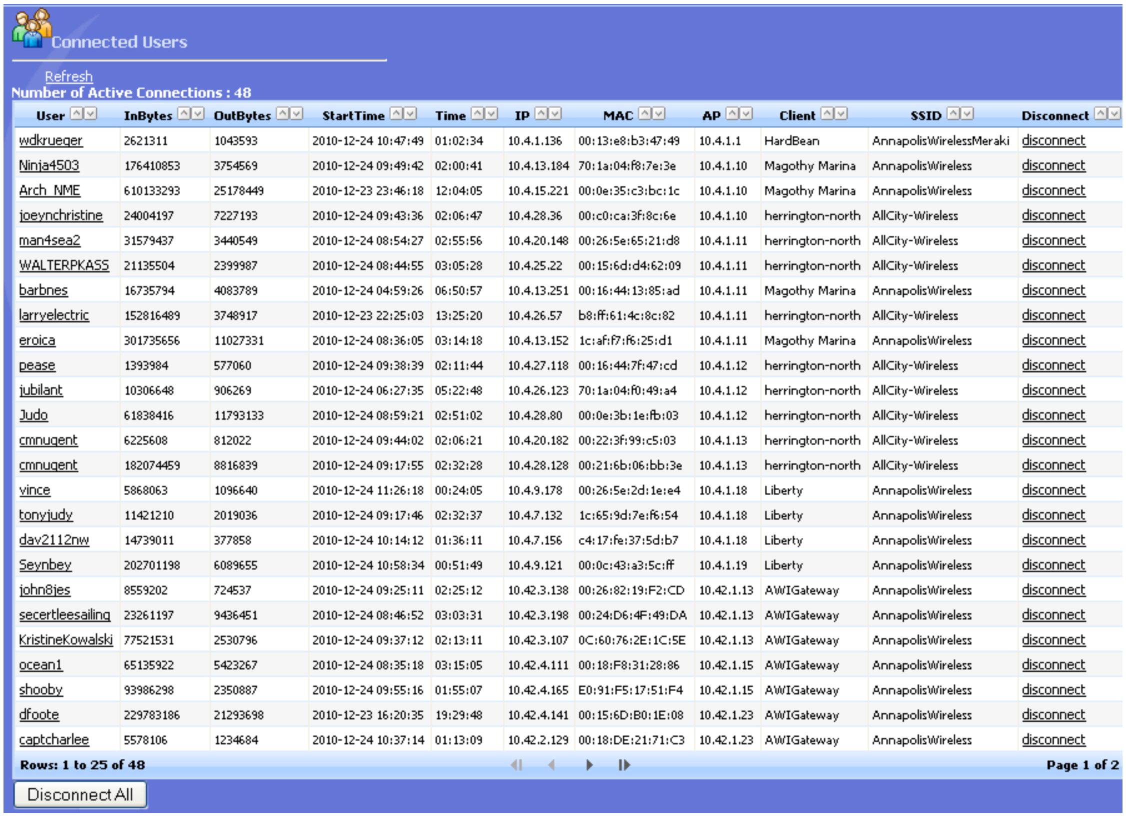
The table provides the username, traffic, start time, time connected, IP, MAC, Access Point (AP), Client, and SSID. See Table 1-1 for more information on each entry.

Field	**Description**
User	The username of the user connected to the WiDirect. Clicking this links brings up the user edit page for that user.
InBytes & OutBytes	The amount of bandwidth (in bytes) the user has used for this session
Start Time	The date and time the session began

Time	Total time connected for this session in Hours: Minutes: Seconds.
IP	The IP address the user is currently using. If the network has multiple WiDirect clients, users may appear to be using the same IP address. (Because each client has its own network behind NAT.)
MAC	The user's current mac address.
AP	The AP the user is on. Only available if Radius accounting has been enabled in the firewall. See Firewall configuration for more information. Otherwise, the AP will display as “unknown”
Client	This is the client that the user is currently connected to. Only useful if there are more than one WiDirect machines on the network.
SSID	The SSID the user has associated with for this session.
Disconnect	Clicking on this link will automatically disconnect the user from the network.

Table 1-1: Active User Fields

The ***Disconnect*** button at the end of each row allows administrators to quickly disconnect individual users. There is a ***Disconnect All*** button at the bottom of the page that allows an administrator to completely disconnect all active users in a single step.



Connected Users

Refresh

Number of Active Connections : 48

User	InBytes	OutBytes	StartTime	Time	IP	MAC	AP	Client	SSID	Disconnect
wdkrueger	2621311	1043593	2010-12-24 10:47:49	01:02:34	10.4.1.136	00:13:e8:b3:47:49	10.4.1.1	HardBean	AnnapolisWirelessMeraki	disconnect
Ninja4503	176410853	3754569	2010-12-24 09:49:42	02:00:41	10.4.13.184	70:1a:04:f8:7e:3e	10.4.1.10	Magothy Marina	AnnapolisWireless	disconnect
Arch_NME	610133293	25178449	2010-12-23 23:46:18	12:04:05	10.4.15.221	00:0e:35:c3:bc:1c	10.4.1.10	Magothy Marina	AnnapolisWireless	disconnect
joeynchristine	24004197	7227193	2010-12-24 09:43:36	02:06:47	10.4.28.36	00:c0:ca:3f:8c:6e	10.4.1.10	herrington-north	AllCity-Wireless	disconnect
man4sea2	31579437	3440549	2010-12-24 08:54:27	02:55:56	10.4.20.148	00:26:5e:65:21:d8	10.4.1.11	herrington-north	AllCity-Wireless	disconnect
WALTERPKASS	21135504	2399987	2010-12-24 08:44:55	03:05:28	10.4.25.22	00:15:6d:d4:62:09	10.4.1.11	herrington-north	AllCity-Wireless	disconnect
barbnes	16735794	4083789	2010-12-24 04:59:26	06:50:57	10.4.13.251	00:16:44:13:85:ad	10.4.1.11	Magothy Marina	AnnapolisWireless	disconnect
larryelectric	152816489	3748917	2010-12-23 22:25:03	13:25:20	10.4.26.57	b8:ff:61:4c:8c:82	10.4.1.11	herrington-north	AllCity-Wireless	disconnect
eroica	301735656	11027331	2010-12-24 08:36:05	03:14:18	10.4.13.152	1c:af:f7:f6:25:d1	10.4.1.11	Magothy Marina	AnnapolisWireless	disconnect
pease	1393984	577060	2010-12-24 09:38:39	02:11:44	10.4.27.118	00:16:44:7f:47:cd	10.4.1.12	herrington-north	AllCity-Wireless	disconnect
jubilant	10306648	906269	2010-12-24 06:27:35	05:22:48	10.4.26.123	70:1a:04:f0:49:a4	10.4.1.12	herrington-north	AllCity-Wireless	disconnect
Judo	61838416	11793133	2010-12-24 08:59:21	02:51:02	10.4.28.80	00:0e:3b:1e:fb:03	10.4.1.12	herrington-north	AllCity-Wireless	disconnect
cmnugent	6225608	812022	2010-12-24 09:44:02	02:06:21	10.4.20.182	00:22:3f:99:c5:03	10.4.1.13	herrington-north	AllCity-Wireless	disconnect
cmnugent	182074459	8816839	2010-12-24 09:17:55	02:32:28	10.4.28.128	00:21:6b:06:bb:3e	10.4.1.13	herrington-north	AllCity-Wireless	disconnect
vince	5868063	1096640	2010-12-24 11:26:18	00:24:05	10.4.9.178	00:26:5e:2d:1e:e4	10.4.1.18	Liberty	AnnapolisWireless	disconnect
tonyjudy	11421210	2019036	2010-12-24 09:17:46	02:32:37	10.4.7.132	1c:65:9d:7e:f6:54	10.4.1.18	Liberty	AnnapolisWireless	disconnect
dav2112nw	14739011	377858	2010-12-24 10:14:12	01:36:11	10.4.7.156	c4:17:fe:37:5d:b7	10.4.1.18	Liberty	AnnapolisWireless	disconnect
Seynbey	202701198	6089655	2010-12-24 10:58:34	00:51:49	10.4.9.121	00:0c:43:a3:5c:ff	10.4.1.19	Liberty	AnnapolisWireless	disconnect
john8jes	8559202	724537	2010-12-24 09:25:11	02:25:12	10.42.3.138	00:26:82:19:F2:CD	10.42.1.13	AWIGateway	AnnapolisWireless	disconnect
secertleesailing	23261197	9436451	2010-12-24 08:46:52	03:03:31	10.42.3.198	00:24:D6:4F:49:DA	10.42.1.13	AWIGateway	AnnapolisWireless	disconnect
KristineKowalski	77521531	2530796	2010-12-24 09:37:12	02:13:11	10.42.3.107	0C:60:76:2E:1C:5E	10.42.1.13	AWIGateway	AnnapolisWireless	disconnect
ocean1	65135922	5423267	2010-12-24 08:35:18	03:15:05	10.42.4.111	00:18:F8:31:28:86	10.42.1.15	AWIGateway	AnnapolisWireless	disconnect
shooby	93986298	2350887	2010-12-24 09:55:16	01:55:07	10.42.4.165	E0:91:F5:17:51:F4	10.42.1.15	AWIGateway	AnnapolisWireless	disconnect
dfoote	229783186	21293698	2010-12-23 16:20:35	19:29:48	10.42.4.141	00:15:6D:B0:1E:08	10.42.1.23	AWIGateway	AnnapolisWireless	disconnect
captcharlee	5578106	1234684	2010-12-24 10:37:14	01:13:09	10.42.2.129	00:18:DE:21:71:C3	10.42.1.23	AWIGateway	AnnapolisWireless	disconnect

Rows: 1 to 25 of 48

Page 1 of 2

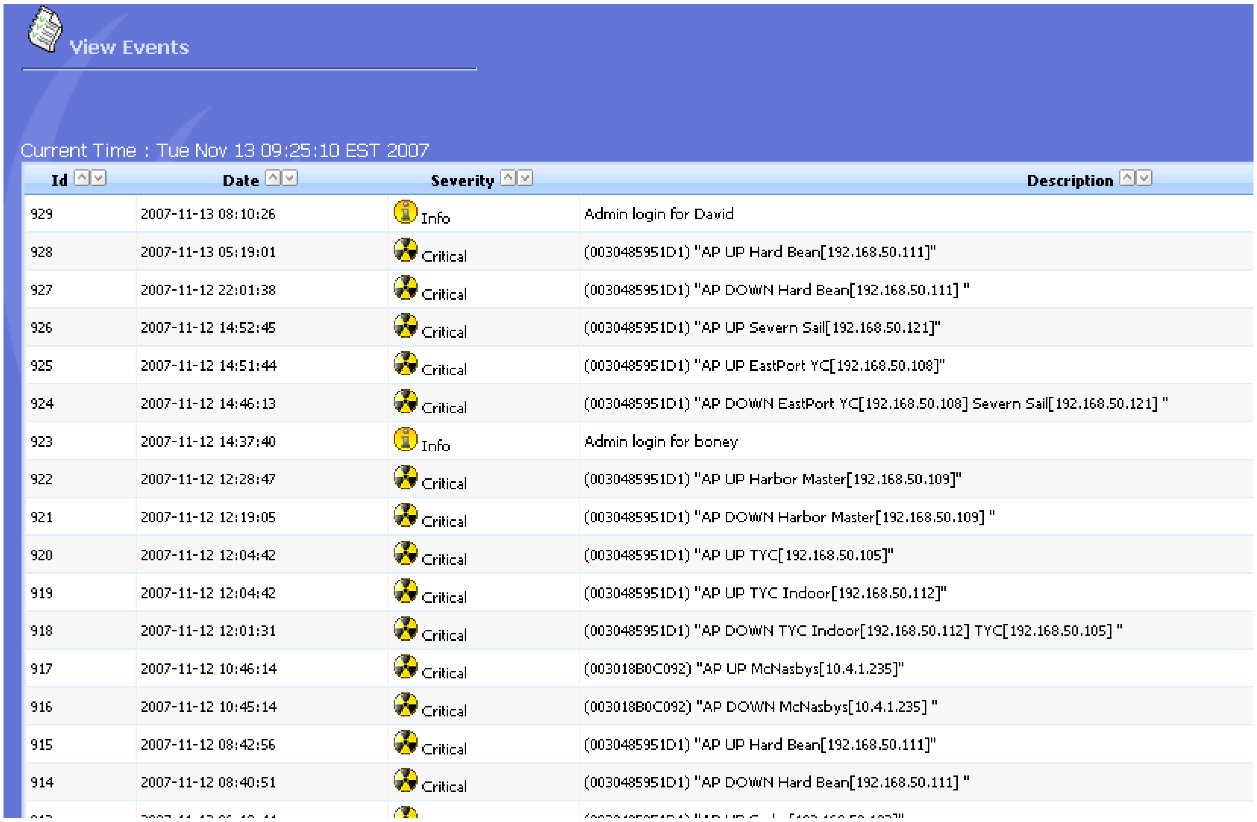
Figure 1-1: Active Users Screenshot

1.2.3 Event Viewer

The WiDirect’s Event Viewer, which is in the ***System Status*** menu, provides a time line of activity in the network. It shows administrator log-in time, AP status checks, watchdog events, process start/stop actions, client monitoring, and other system activity.

Events are rated on Severity, which ranges from ***Info***, ***Alert***, and ***Critical***. If needed, administrators can obtain more detailed event information in the **Reports** section, which allows sorting by severity.

Note: The Event Viewer page also displays the local current system time, which allows administrators to quickly figure out timing of recent events.



Current Time : Tue Nov 13 09:25:10 EST 2007

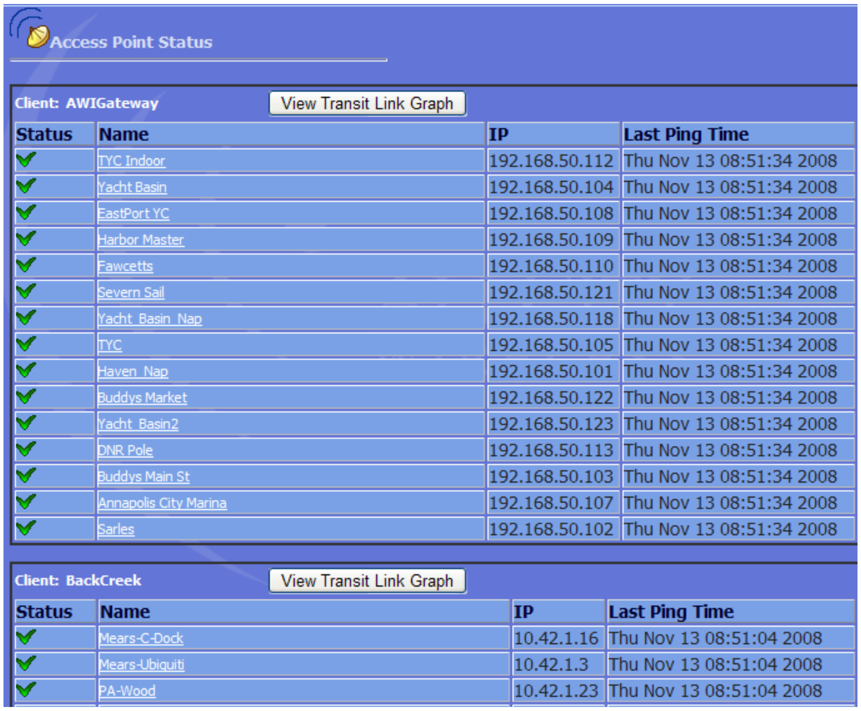
Id	Date	Severity	Description
929	2007-11-13 08:10:26	Info	Admin login for David
928	2007-11-13 05:19:01	Critical	(0030485951D1) "AP UP Hard Bean[192.168.50.111]"
927	2007-11-12 22:01:38	Critical	(0030485951D1) "AP DOWN Hard Bean[192.168.50.111] "
926	2007-11-12 14:52:45	Critical	(0030485951D1) "AP UP Severn Sail[192.168.50.121]"
925	2007-11-12 14:51:44	Critical	(0030485951D1) "AP UP EastPort YC[192.168.50.108]"
924	2007-11-12 14:46:13	Critical	(0030485951D1) "AP DOWN EastPort YC[192.168.50.108] Severn Sail[192.168.50.121] "
923	2007-11-12 14:37:40	Info	Admin login for boney
922	2007-11-12 12:28:47	Critical	(0030485951D1) "AP UP Harbor Master[192.168.50.109]"
921	2007-11-12 12:19:05	Critical	(0030485951D1) "AP DOWN Harbor Master[192.168.50.109] "
920	2007-11-12 12:04:42	Critical	(0030485951D1) "AP UP TYC[192.168.50.105]"
919	2007-11-12 12:04:42	Critical	(0030485951D1) "AP UP TYC Indoor[192.168.50.112]"
918	2007-11-12 12:01:31	Critical	(0030485951D1) "AP DOWN TYC Indoor[192.168.50.112] TYC[192.168.50.105] "
917	2007-11-12 10:46:14	Critical	(003018B0C092) "AP UP McNasbys[10.4.1.235]"
916	2007-11-12 10:45:14	Critical	(003018B0C092) "AP DOWN McNasbys[10.4.1.235] "
915	2007-11-12 08:42:56	Critical	(0030485951D1) "AP UP Hard Bean[192.168.50.111]"
914	2007-11-12 08:40:51	Critical	(0030485951D1) "AP DOWN Hard Bean[192.168.50.111] "

Figure 1-2: Event Viewer Page

1.2.4 AP Status

WiDirect administrators can use the AP Status page, which is under the ***System Status*** menu, to monitor the Access Points on their wireless networks. Access Points are added in the ***System Configuration->Access Points*** menu, which is covered later in this manual. This page only reports the status of configured and enabled access points.

Every Access Point that has been ***enabled*** will automatically be monitored by the WiDirect. This page provides a quick overview of an up/down status of the Access Points, as shown in Figure 1-3. Each AP lists ***Status*** (up/down), ***Name***, ***IP***, and ***Last Ping Time***. If the AP *Name* is clicked, the WiDirect opens the detail page for that AP, which lists all the information that has been gathered via network monitoring. **Last ping Date** is the last time the WiDirect successfully pinged the AP.



Access Point Status

Client: AWIGateway

Status	Name	IP	Last Ping Time
✓	TYC Indoor	192.168.50.112	Thu Nov 13 08:51:34 2008
✓	Yacht Basin	192.168.50.104	Thu Nov 13 08:51:34 2008
✓	EastPort YC	192.168.50.108	Thu Nov 13 08:51:34 2008
✓	Harbor Master	192.168.50.109	Thu Nov 13 08:51:34 2008
✓	Fawcetts	192.168.50.110	Thu Nov 13 08:51:34 2008
✓	Severn Sail	192.168.50.121	Thu Nov 13 08:51:34 2008
✓	Yacht_Basin_Nap	192.168.50.118	Thu Nov 13 08:51:34 2008
✓	TYC	192.168.50.105	Thu Nov 13 08:51:34 2008
✓	Haven_Nap	192.168.50.101	Thu Nov 13 08:51:34 2008
✓	Buddys Market	192.168.50.122	Thu Nov 13 08:51:34 2008
✓	Yacht_Basin2	192.168.50.123	Thu Nov 13 08:51:34 2008
✓	DNR Pole	192.168.50.113	Thu Nov 13 08:51:34 2008
✓	Buddys Main St	192.168.50.103	Thu Nov 13 08:51:34 2008
✓	Annapolis City Marina	192.168.50.107	Thu Nov 13 08:51:34 2008
✓	Sarles	192.168.50.102	Thu Nov 13 08:51:34 2008

Client: BackCreek

Status	Name	IP	Last Ping Time
✓	Mears-C-Dock	10.42.1.16	Thu Nov 13 08:51:04 2008
✓	Mears-Ubiquiti	10.42.1.3	Thu Nov 13 08:51:04 2008
✓	PA-Wood	10.42.1.23	Thu Nov 13 08:51:04 2008

Figure 1-3: AP Status Page

The ***View Transit Link Graph*** button provides a real time view of the wireless mesh TL links. This page not only shows which APs have neighbors, but also provides the TL signal strength and the current number of associated users on the AP. Figure 1-4 shows a sample TL graph link page. Although considered real time, this graph only updates every 5-10 minutes due to the amount of SNMP polling data to collect per Access Point on the network.

Note: The TL graph page also displays the serial number of the AP as well as the time the graph was generated.

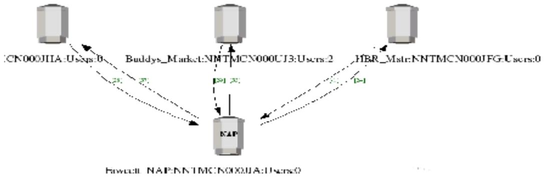

:CN000JHA:Users:0
Buddys_Market:NNTMCN000UJ3:Users:2
HBR_Mstr:NNTMCN000JFG:Users:0
NAP
Fawcett_NAP:NNTMCN000JJA:Users:0

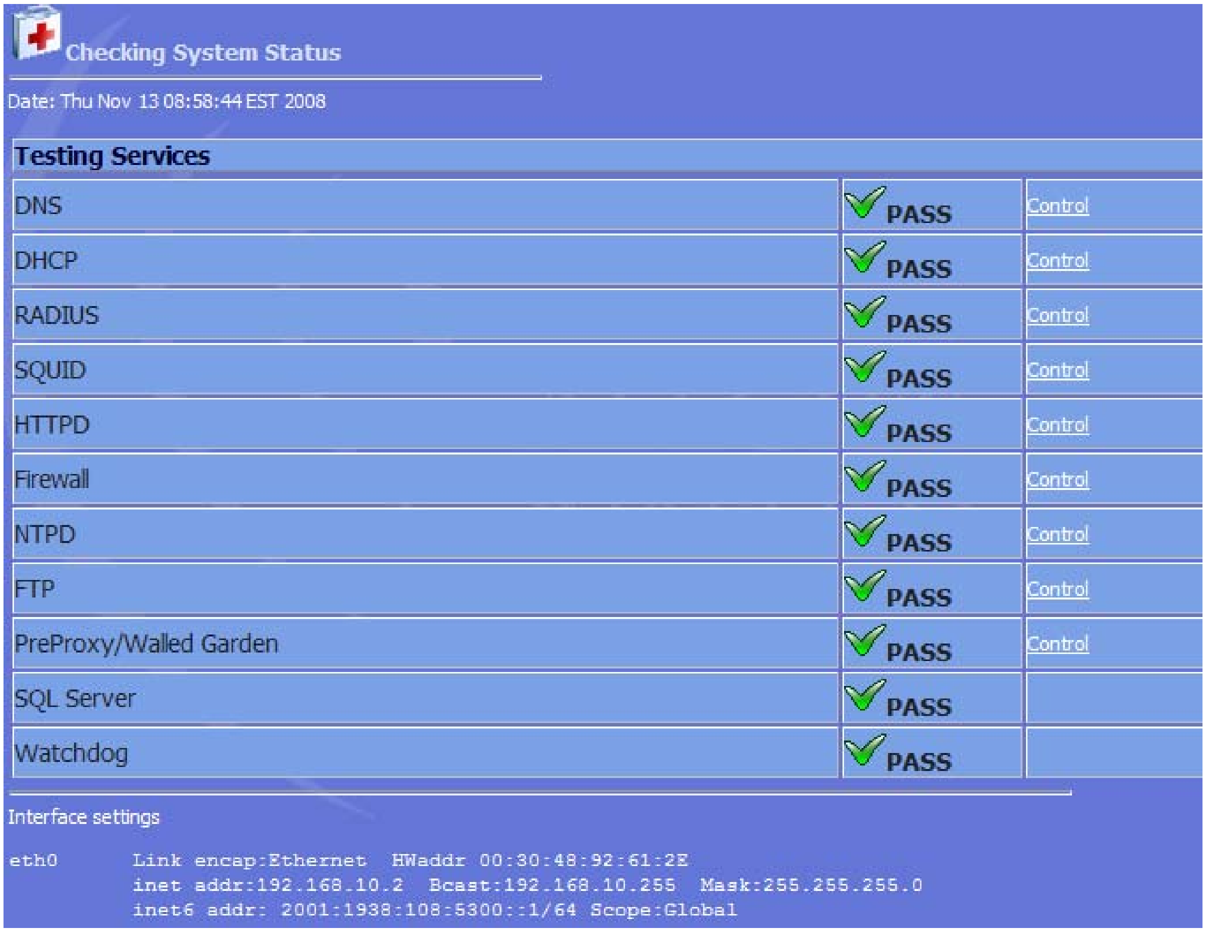
Figure 1-4: TL Graph Sample

1.2.5 System Check

The ***System Check*** page under the ***System Status*** menu displays a snapshot of the current health of the WiDirect system, as show in Figure 1-5. This page analyzes important system functions, such as **Radius, DNS, DHCP, Firewall, NTPD**, **PreProxy, Squid, and FTP** services by establishing if they are running or not. If for any reason a service has been disabled, clicking on the **Control** button next to each process in order to re-enable it.

Although the WiDirect has a built in watchdog program that automatically restarts any WiDirect process that has failed, it will not restart any process that the administrator has explicitly stopped. For example, if the administrator stops **Radius** via the control window, the watchdog program understands this action and will not attempt to restart Radius. However, if the Radius process dies, the watchdog will automatically restart the process without Administrator intervention.

Other information that can be found on this page is **Interface Settings, Routing table, NTP status**, and **Network statistics.** When contacting AWI technical support, the data on this page will be used to troubleshoot the health of the WiDirect.



Checking System Status

Date: Thu Nov 13 08:58:44 EST 2008

Testing Services		
DNS	✓ PASS	Control
DHCP	✓ PASS	Control
RADIUS	✓ PASS	Control
SQUID	✓ PASS	Control
HTTPD	✓ PASS	Control
Firewall	✓ PASS	Control
NTPD	✓ PASS	Control
FTP	✓ PASS	Control
PreProxy/Walled Garden	✓ PASS	Control
SQL Server	✓ PASS	
Watchdog	✓ PASS	

Interface settings

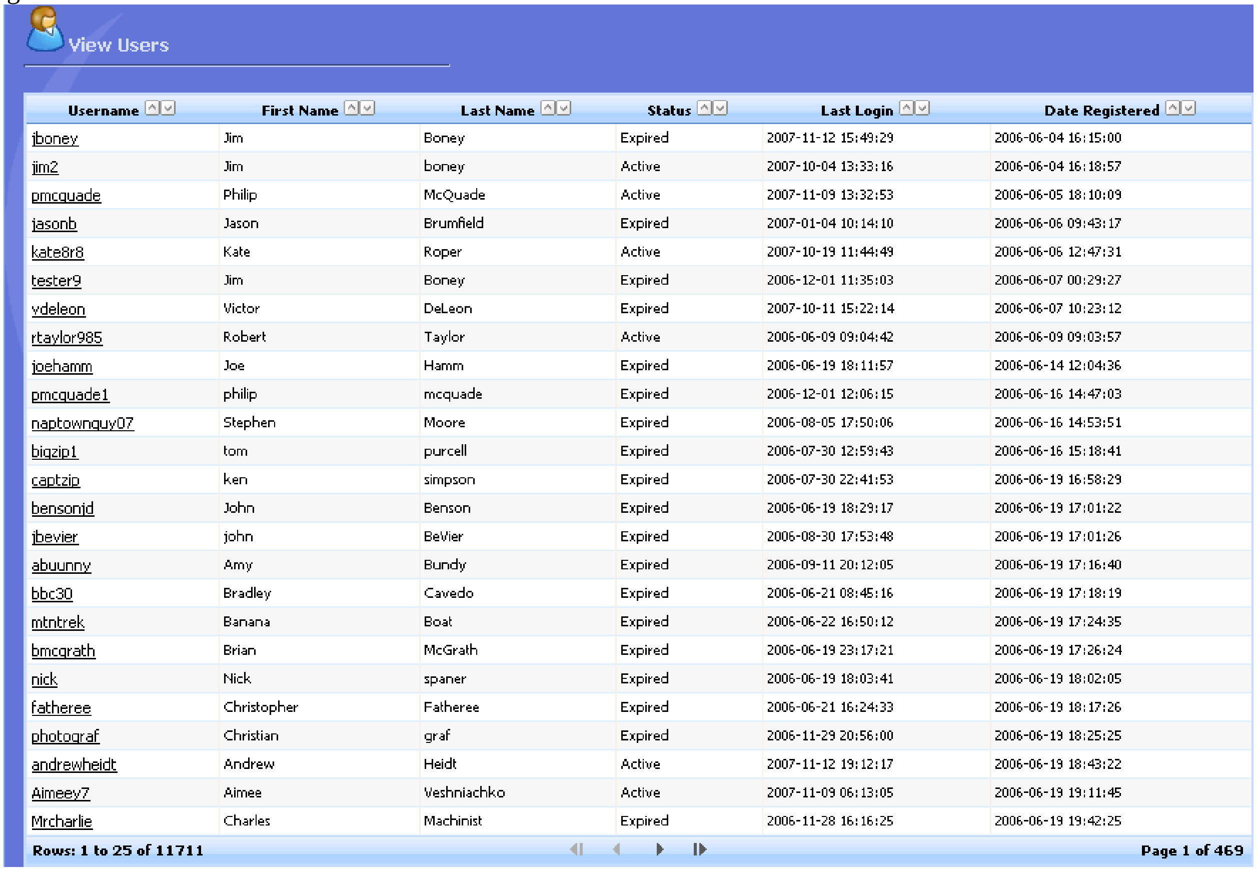
```
eth0      Link encap:Ethernet  HWaddr 00:30:48:92:61:2E
          inet addr:192.168.10.2  Bcast:192.168.10.255  Mask:255.255.255.0
          inet6 addr: 2001:1938:108:5300::1/64 Scope:Global
```

Figure 1-5: System Check

1.3 Users Menu

1.3.1 Viewing All Users (List All)

Clicking on the ***Users->List All*** menu provides an extensive list of all users currently in the WiDirect database. This page views 25 users at a time.



Username	First Name	Last Name	Status	Last Login	Date Registered
jboney	Jim	Boney	Expired	2007-11-12 15:49:29	2006-06-04 16:15:00
jim2	Jim	boney	Active	2007-10-04 13:33:16	2006-06-04 16:18:57
pmcquade	Philip	McQuade	Active	2007-11-09 13:32:53	2006-06-05 18:10:09
jasonb	Jason	Brumfield	Expired	2007-01-04 10:14:10	2006-06-06 09:43:17
kate8r8	Kate	Roper	Active	2007-10-19 11:44:49	2006-06-06 12:47:31
tester9	Jim	Boney	Expired	2006-12-01 11:35:03	2006-06-07 00:29:27
vdeleon	Victor	DeLeon	Expired	2007-10-11 15:22:14	2006-06-07 10:23:12
rtaylor985	Robert	Taylor	Active	2006-06-09 09:04:42	2006-06-09 09:03:57
joehamm	Joe	Hamm	Expired	2006-06-19 18:11:57	2006-06-14 12:04:36
pmcquade1	philip	mcquade	Expired	2006-12-01 12:06:15	2006-06-16 14:47:03
naptownguy07	Stephen	Moore	Expired	2006-08-05 17:50:06	2006-06-16 14:53:51
bigzip1	tom	purcell	Expired	2006-07-30 12:59:43	2006-06-16 15:18:41
captzip	ken	simpson	Expired	2006-07-30 22:41:53	2006-06-19 16:58:29
bensonjd	John	Benson	Expired	2006-06-19 18:29:17	2006-06-19 17:01:22
jbevier	john	BeVier	Expired	2006-08-30 17:53:48	2006-06-19 17:01:26
abuunny	Amy	Bundy	Expired	2006-09-11 20:12:05	2006-06-19 17:16:40
bbc30	Bradley	Cavedo	Expired	2006-06-21 08:45:16	2006-06-19 17:18:19
mtntrek	Banana	Boat	Expired	2006-06-22 16:50:12	2006-06-19 17:24:35
bmcgrath	Brian	McGrath	Expired	2006-06-19 23:17:21	2006-06-19 17:26:24
nick	Nick	spaner	Expired	2006-06-19 18:03:41	2006-06-19 18:02:05
fatheree	Christopher	Fatheree	Expired	2006-06-21 16:24:33	2006-06-19 18:17:26
photograf	Christian	graf	Expired	2006-11-29 20:56:00	2006-06-19 18:25:25
andrewheidt	Andrew	Heidt	Active	2007-11-12 19:12:17	2006-06-19 18:43:22
Aimeey7	Aimee	Veshniachko	Active	2007-11-09 06:13:05	2006-06-19 19:11:45
Mrcharlie	Charles	Machinist	Expired	2006-11-28 16:16:25	2006-06-19 19:42:25

Rows: 1 to 25 of 11711

Page 1 of 469

Figure 1-6: List All Users

This screen shows a snapshot of all users stored in the database, displaying their username, first and last names, status (active, expired, etc.), the date of their last login and the date they registered. Clicking on a username brings up the user edit profile page, which provides all of the user's account information.

1.3.2 Find User

If a customer forgets their username or password or wants to change their contact information, this page allows administrators to quickly search for the user.

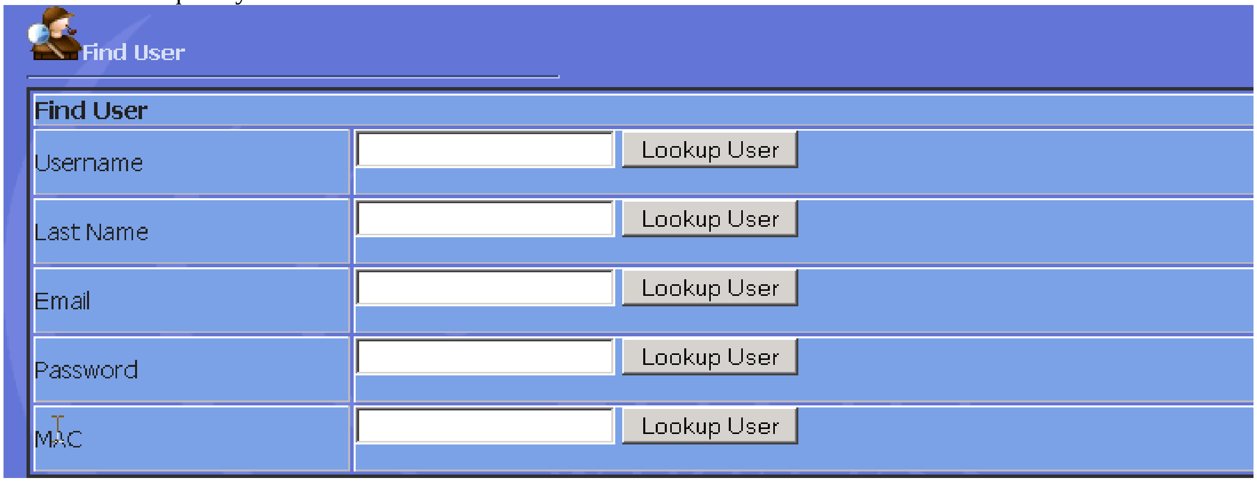


Figure 1-7: Find User

To find a user, enter at least one piece of information about the user, such as username, last name, first name, email address, password, or MAC address and click the *Lookup User* button. The WiDirect will search the database for the information provided and display any matches that it finds.

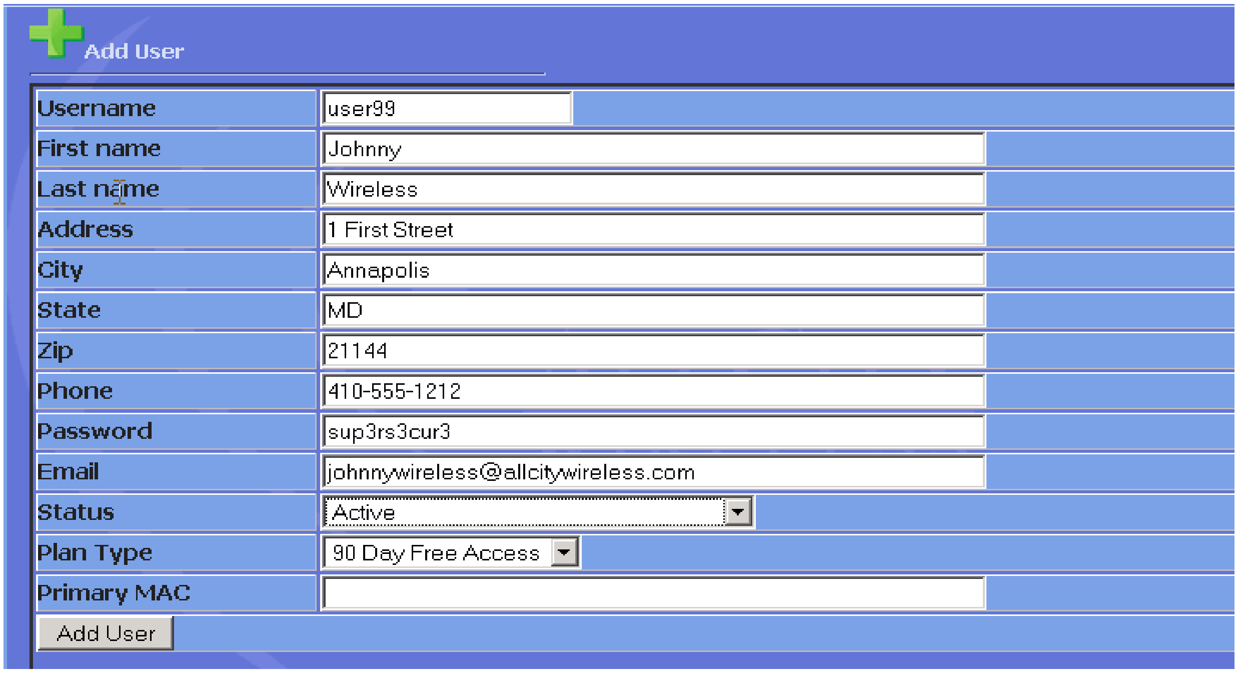
1.3.2.1 Find User Wildcards

Wildcard searches are supported with the character %. For example:

- Find a username that begins with b and ends with y, use "b%y"
- Find a username that contains the word smith, use "%smith%"
- Find all email address that end with hotmail.com, use "%hotmail.com"

If multiple matches are found on the provided search criteria, the WiDirect provides the administrator with a list of all matches.

1.3.3 Add User



Username	user99
First name	Johnny
Last name	Wireless
Address	1 First Street
City	Annapolis
State	MD
Zip	21144
Phone	410-555-1212
Password	sup3rs3cur3
Email	johnnywireless@allcitywireless.com
Status	Active
Plan Type	90 Day Free Access
Primary MAC	

Figure 1-9: Add User

An administrator can use the ***Add User*** page to add a user to the WiDirect's local user database. Most fields are self explanatory with the exception of **Status**, **Plan Type**, and **Primary Mac**.

Status can be Active, Disabled. Expired, or Purchasing. Table 1-2 describes all the possible user status codes.

Active	The user is fully activated and ready to use the system without further configuration.
Disabled	The user has been effectively banned from the network and can never relogin back in without Administrator help.
Expired	The user's plan has expired and the user will be asked to select/purchase a new plan upon their next network login.
Purchasing	The user has been registered but has not purchased a plan, which is useful for creating an account and still having the user to be challenged for a plan selection on their next login.

Table 1-2 User Status Types

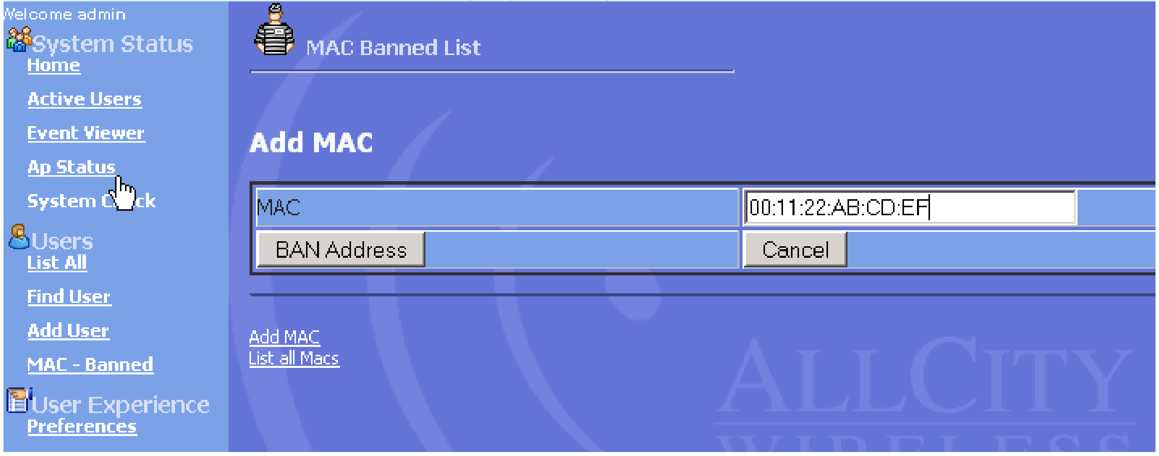
Plan Type is the plan the user is currently using. If a user is added and set to active, a valid plan must be selected. The WiDirect shows all active plans in the pull down menu for this item.

Primary MAC is the MAC address of the user. This entry is only important if MAC based authentication has been enabled and can normally be left blank by the Administrator when adding a new user. The WiDirect will automatically populate this field upon the user's next valid login to the network.

1.3.4 Banning MAC Addresses

In the event that a computer is found to be engaged in malicious or unfavorable behavior, an Administrator can ban the MAC address from the network via the *MAC- Banned* page under the ***Users*** menu. On this page, simply click **Add MAC** which asks for the MAC address to ban.

Administrators can also remove bans from this page by clicking the **delete** button next to the MAC address.



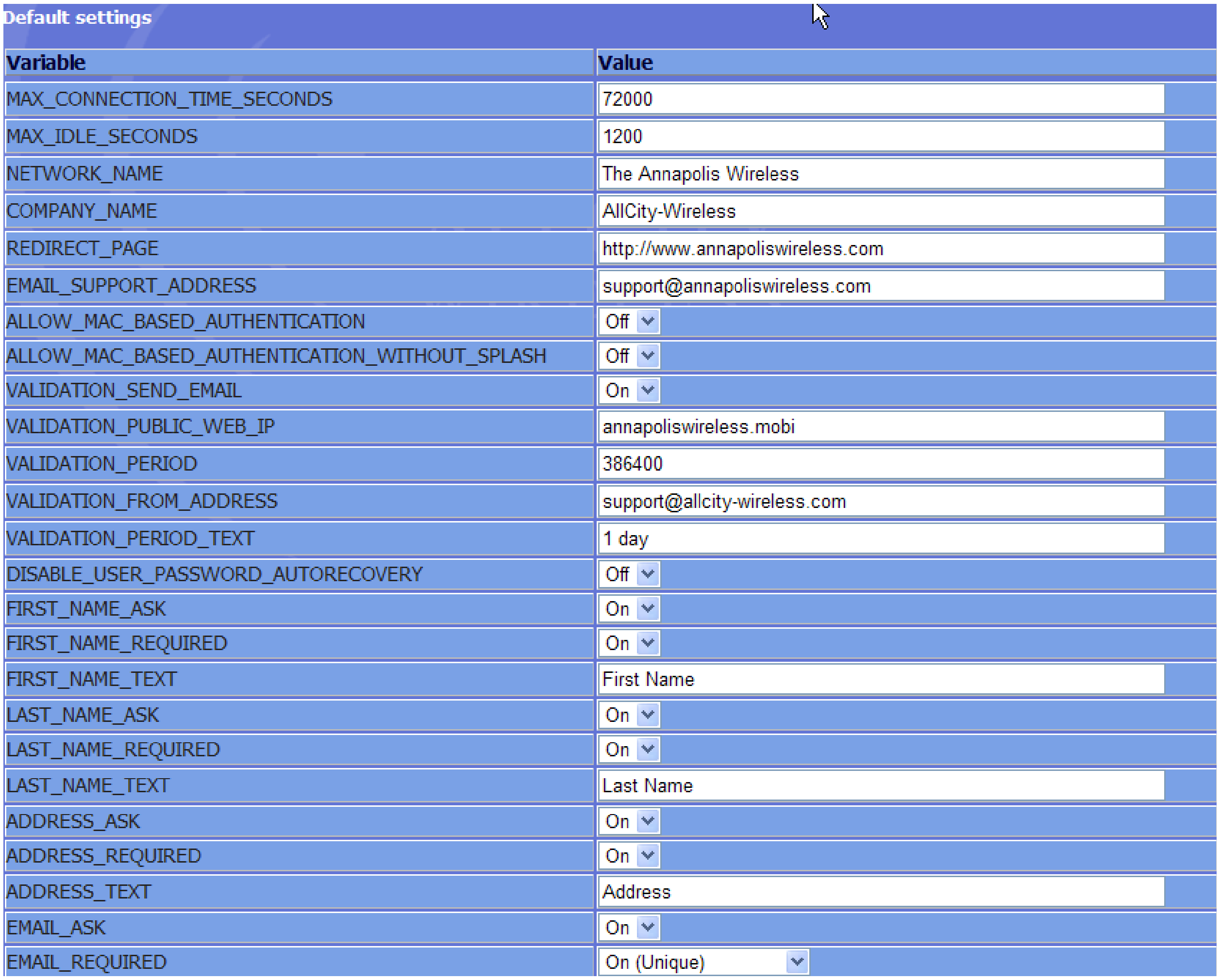
MAC 00:11:22:AB:CD:EF

Figure 1-10: Banning a MAC from the network

1.4 User Experience Menu

1.4.1 Preferences

The **Preferences** page, shown in Figure 1-11, allows an Administrator to define the look and feel for users of the network. For example, the redirect page field forces each user to see a specific web page upon logging onto the network. This might work for attendees at a conference to see the day events, a townhouse community to see the home owner's associations rules and regulations, or even expose end users to a splash page of advertisers.



Default settings

Variable	Value
MAX_CONNECTION_TIME_SECONDS	72000
MAX_IDLE_SECONDS	1200
NETWORK_NAME	The Annapolis Wireless
COMPANY_NAME	AllCity-Wireless
REDIRECT_PAGE	http://www.annapoliswireless.com
EMAIL_SUPPORT_ADDRESS	support@annapoliswireless.com
ALLOW_MAC_BASED_AUTHENTICATION	Off
ALLOW_MAC_BASED_AUTHENTICATION_WITHOUT_SPLASH	Off
VALIDATION_SEND_EMAIL	On
VALIDATION_PUBLIC_WEB_IP	annapoliswireless.mobi
VALIDATION_PERIOD	386400
VALIDATION_FROM_ADDRESS	support@allcity-wireless.com
VALIDATION_PERIOD_TEXT	1 day
DISABLE_USER_PASSWORD_AUTORECOVERY	Off
FIRST_NAME_ASK	On
FIRST_NAME_REQUIRED	On
FIRST_NAME_TEXT	First Name
LAST_NAME_ASK	On
LAST_NAME_REQUIRED	On
LAST_NAME_TEXT	Last Name
ADDRESS_ASK	On
ADDRESS_REQUIRED	On
ADDRESS_TEXT	Address
EMAIL_ASK	On
EMAIL_REQUIRED	On (Unique)

Figure 1-11: Preferences

The default entries for each field, which is described in the table below, provide the default behavior of each setting. Administrators can override each setting at the SSID level. If an entry is configured in the SSID settings submenu, the SSID level setting will be used if the user connects to the SSID.

If no setting is configured in the SSID settings submenu, the default setting will be used.

Field Dependencies - (Default vs. Per SSID) User experience preferences can be either a global default setting or an SSID specific parameters.

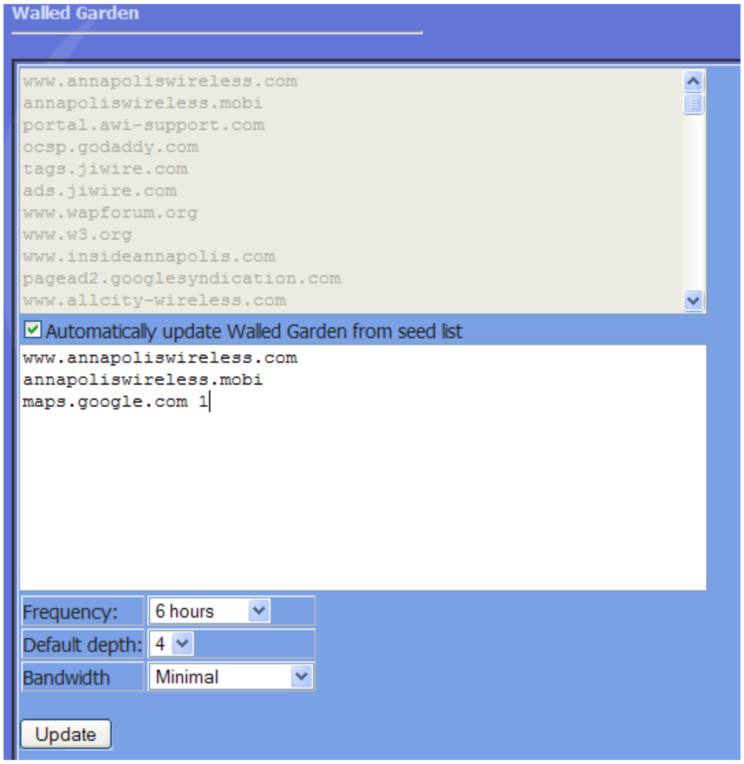
MAX_CONNECTION_TIME_SECONDS	The maximum connection time before a user is disconnected and they need to login again. This setting is useful for Advertising based networks, where users should view the login ads at intervals.
MAX_IDLE_SECONDS	Maximum time in seconds that an idle user is allowed to be connected. If no traffic is passed on their connection, they are considered idle and once idle for this many seconds, they are disconnected from the WiDirect.
NETWORK_NAME	Name of the network, displayed in the login page and terms and conditions and where ever the %NETWORK_NAME% variable is used in the branding section.
COMPANY_NAME	Name of ISP, used in the branding wherever %COMPANY_NAME% variable is used.
REDIRECT_PAGE	The page the user is redirected to upon logging into the network. Leave this field blank to redirect user to their originally requested URL.
EMAIL_SUPPORT_ADDRESS	Email address displayed to the user in branding.
ALLOW_MAC_BASED_AUTHENTICATION	Firewall section must be properly configured in order for a user's MAC address can be established by using the user's MAC address as the validation instead of usernames and passwords. This setting allows the user to bypass the login page. However, they must still start their browser to be 'logged' into the system.
ALLOW_MAC_BASED_AUTHENTICATION_WITHOUT_SPLASH	This setting allows users to be authenticated via radius messages. As soon as a user is connected to the mesh, they will be authenticated into the system without starting a browser. In order for this to work properly, **ALLOW_MAC_BASED_AUTHENTICATION** must also be enabled AND the **getapfromradius** must be set in the firewall configuration. See firewall section for more information
VALIDATION_SEND_EMAIL	This setting tells the WiDirect to send the “verification” email to the user. In this email, the user is requested to “Verify” their email address by clicking on a link.
VALIDATION_PUBLIC_WEB_IP	The public IP or domain of the web server, which is used in the Verification emails sent to newly registered users. In this email, the user must click on a URL to validate their account. This must also be properly filled in to accept payment through Authorize.net or PayPal. This field sets the domain of that URL
VALIDATION_PERIOD	This setting is currently unused by the system and is for future releases of the software. In the future, it will define the number of seconds (usually 1 day or more) that the user has to click on the validation

	email URL before their account is disabled. In other words, if they do not validate their email address by clicking on the URL in the validation email, their account will be suspended until they do.
VALIDATION_FROM_ADDRESS	The email address that a user sees verification emails originating from.
VALIDATION_PERIOD_TEXT	The amount of time in text format that is displayed to the user in the validation email. Instead of saying the amount of seconds that's defined in the VALIDATION_FROM_EMAIL, this allows the administrator to define a more human readable form of the amount to time. For example, '1 day' might be a desirable value instead of saying 38640 seconds.
DISABLE_USER_PASSWORD_AUTORECOVERY	If enabled, the “Forgot Password?” link will be removed from the login page. This is a security parameter that can be used at the administrator’s discretion. Set 1 to enable, 0 to disable.
FIRST_NAME_ASK **FIRST_NAME REQUIRED** **FIRST_NAME_TEXT** **LAST_NAME_ASK** **LAST_NAME_REQUIRED** **LAST_NAME_TEXT** **ORG_ASK** **ORG_REQUIRED** **ORG_TEXT** **CITY_ASK** **CITY_REQUIRED** **CITY_TEXT** **STATE_ASK** **STATE_REQUIRED** **STATE_TEXT** **ZIP_ASK** **ZIP_REQUIRED** **ZIP_TEXT** **TERMS_AND_CONDITIONS_ASK** **CAPTCHA_ASK**	These options allow for customization of the registration process for new users of the network. Each of the standard fields can be changed to ask for something different, or disabled completely. The captcha, a security code used to prevent automated registrations, can also be enabled to prevent automated account registrations. The text of the terms and conditions can be edited in the SSID branding section.
COLLECT_USERNAME_AND_PASSWORD	The collection of usernames and passwords can be disabled if authenticating users based on their MAC address.

Table 1-3: Preferences Options

1.4.2 Walled Garden

The WiDirect's ***Walled Garden*** allows administrators to host local content (e.g., community website) that can be integrated into the captive portal-landing page. For example, administrators might want their users to go to google.com without network authentication. In order to allow this, only ".google.com" needs to be added to the Walled Garden list. The WiDirect can also be configured to automatically search for web pages to add to the walled garden. This allows for the user to browse a web site and all the sites linked to from that web site. If some sites do not need to be crawled as deeply as others, the depth to be crawled of each site can be specified on the same line as the site. As the Walled Garden Crawler may not be able find all sites that are needed to display a web page properly, it is a good idea to test that the pages are displaying correctly and add additional sites as needed.



```
www.annapoliswireless.com
annapoliswireless.mobi
portal.awi-support.com
ocsp.godaddy.com
tags.jiwire.com
ads.jiwire.com
www.wapforum.org
www.w3.org
www.insideannapolis.com
pagead2.googlesyndication.com
www.allcity-wireless.com
```

☑ Automatically update Walled Garden from seed list

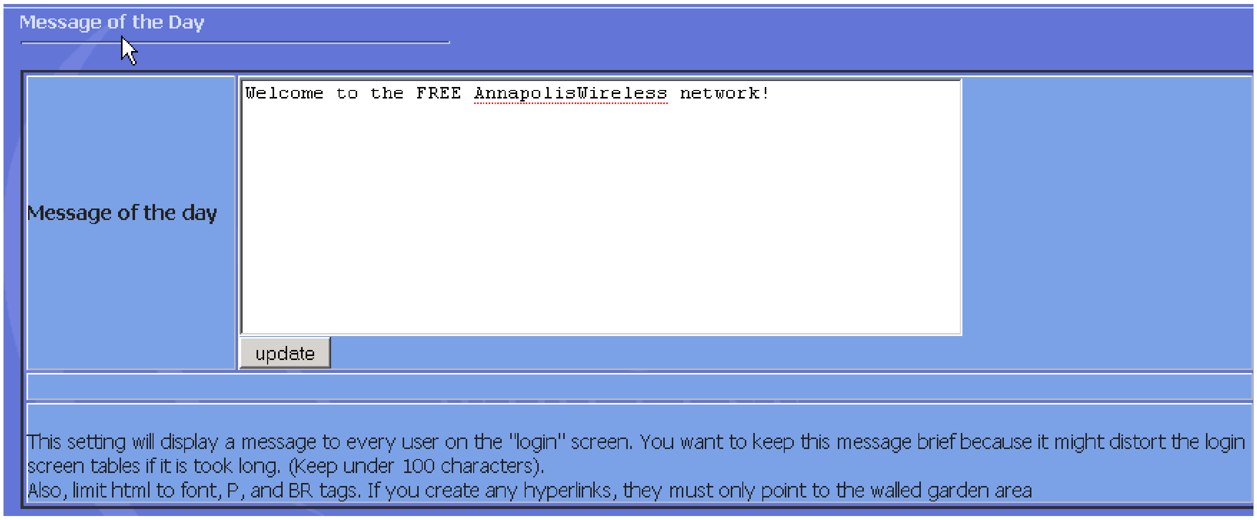
```
www.annapoliswireless.com
annapoliswireless.mobi
maps.google.com 1
```

Frequency:	6 hours
Default depth:	4
Bandwidth	Minimal

Figure 1-12: Walled Garden

1.4.3 Message of the Day

The ***Message of the Day*** *(MOTD)* feature allows administrators to create messages that appear on the login screen. When the user is prompted for the username and password, the message of the day will also be displayed depending on how the branding is configured. See the branding section for more information on how the MOTD is displayed on the login screen.



```
Welcome to the FREE AnnapolisWireless network!
```

This setting will display a message to every user on the "login" screen. You want to keep this message brief because it might distort the login screen tables if it is took long. (Keep under 100 characters).
Also, limit html to font, P, and BR tags. If you create any hyperlinks, they must only point to the walled garden area

Figure 1-13: Message of the Day

The entire MOTD field can accept HTML code. However, only hyperlinks, <font>, <p>, and <br> tags should be used to keep any distortion to a minimum. Any external links added to the MOTD need to be in the walled garden or in the firewall configuration.

1.4.4 SSID Branding

All WiDirect units come with a default set of fully implemented authentication portal pages. This is a completely functional Captive Portal and can be used to perform all needed authentication related functions. New users may sign up through this portal by entering their desired login/password, name, contact information, and billing information. The included portal may be modified to include customized graphics and textual information such as usage agreements and contact information.

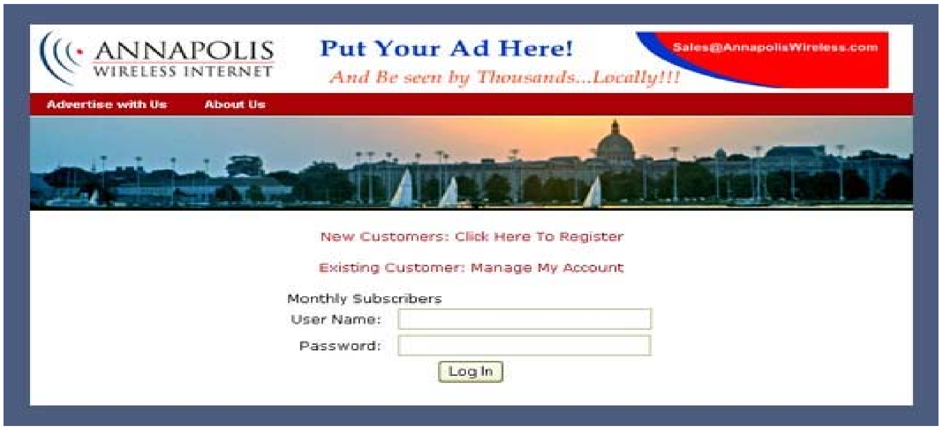
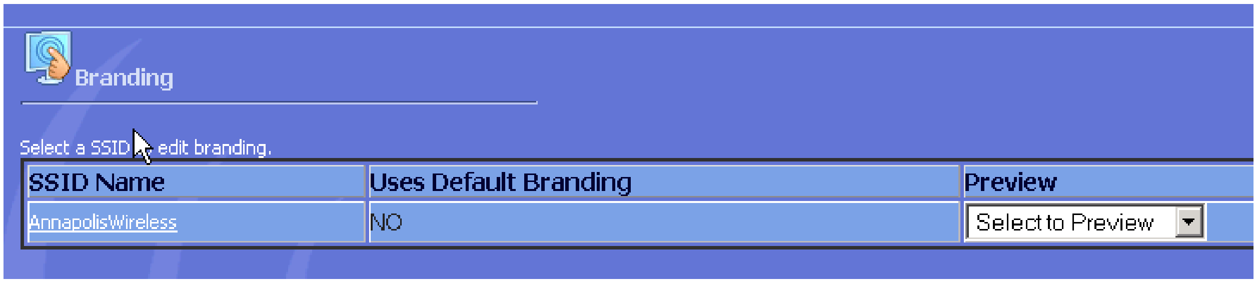

ANNAPOLIS
WIRELESS INTERNET
Put Your Ad Here!
And Be seen by Thousands...Locally!!!
Sales@AnnapolisWireless.com
Advertise with Us
About Us
New Customers: Click Here To Register
Existing Customer: Manage My Account
Monthly Subscribers
User Name:
Password:
Log In

Figure 1-14: Sample Login Page

To customize these Authentication pages, click on *SSID Branding* link under the *User Experience* menu. From here, select which SSID to change the branding on the branding edit page.

Select the **Preview** button to view what the login, Forgot Password, Change Password, and Register pages will look like to users with this branding.

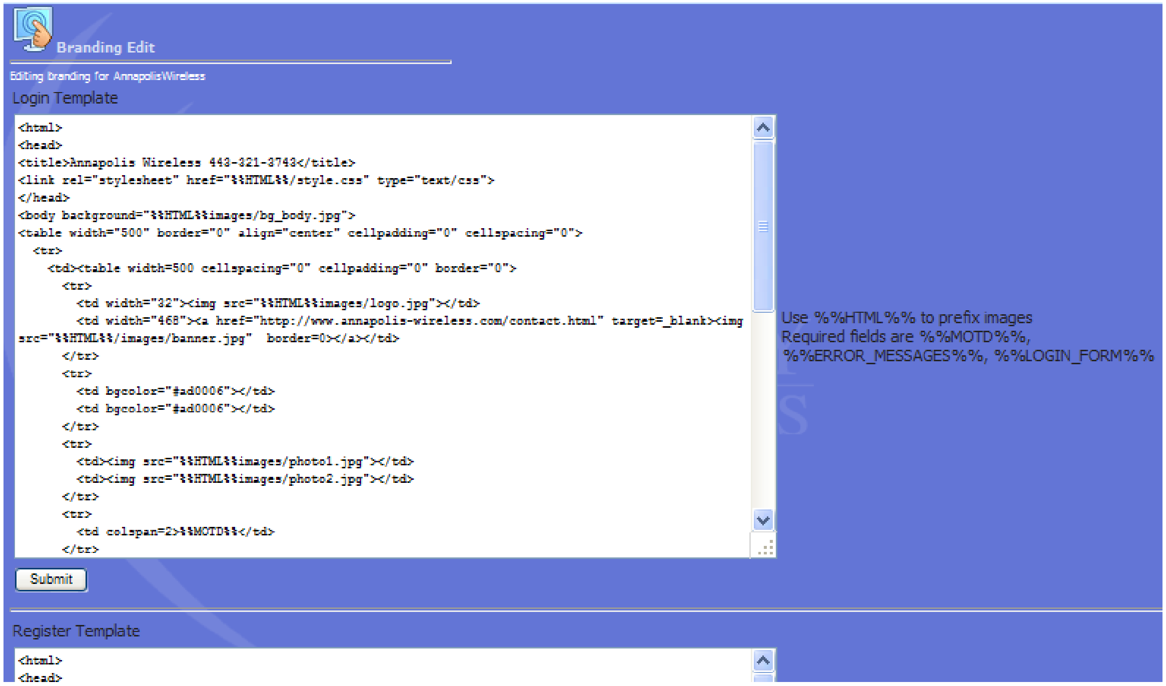


Select a SSID edit branding.

SSID Name	Uses Default Branding	Preview
AnnapolisWireless	NO	Select to Preview

Figure 1-15: SSID Branding Selection

When an SSID is selected from the Branding Selection page, a new page is shown that lists each possible brandable page, as shown in Figure 1-16.



Editing branding for AnnapolisWireless

Login Template

```
<html>
<head>
<title>Annapolis Wireless 443-321-3743</title>
<link rel="stylesheet" href="%%HTML%%/style.css" type="text/css">
</head>
<body background="%%HTML%%images/bg_body.jpg">
<table width="500" border="0" align="center" cellpadding="0" cellspacing="0">
  <tr>
    <td><table width=500 cellspacing="0" cellpadding="0" border="0">
      <tr>
        <td width="32"><img src="%%HTML%%images/logo.jpg"></td>
        <td width="468"><a href="http://www.annapolis-wireless.com/contact.html" target=_blank><img
src="%%HTML%%/images/banner.jpg"  border=0></a></td>
      </tr>
      <tr>
        <td bgcolor="#ad0006"></td>
        <td bgcolor="#ad0006"></td>
      </tr>
      <tr>
        <td><img src="%%HTML%%images/photo1.jpg"></td>
        <td><img src="%%HTML%%images/photo2.jpg"></td>
      </tr>
      <tr>
        <td colspan=2>%%MOTD%%</td>
      </tr>
```

Use %%HTML%% to prefix images
Required fields are %%MOTD%%, %%ERROR_MESSAGES%%, %%LOGIN_FORM%%

Register Template

```
<html>
<head>
```

Figure 1-16: SSID Branding

On this page, there are Login, Register, Purchase, Terms & Conditions, Forgot Password, Change Password, Expired Page, Stylesheet, and Verification email templates. Each page has certain keywords that it supports. Each page has a list to the right that describes which variables are valid for that page.

For example, the Login page allows the following variables.

%%HTML%%	Available on all branding pages. Used when referencing images and other files that exist on the WiDirect. See the Using Images in Branding section below for more information. NOTE: This must also be used when referencing the CSS stylesheet. See the example branding file below as an example.

%%MOTD%%	The WiDirect replaces this with the text from the MOTD.
%%ERROR_MESSAGES%%	If there was an error message, such as “Incorrect Password”, this variable tells the WiDirect where to place that information.
%%LOGIN_FORM%%	Where the login form will be displayed. This variable IS REQUIRED for the login branding page.

Table 1-4: Login Form Branding variables

The following is a sample login branding page. All the variables have been bolded to make it easier to read.

```
<html>
<head>
<link rel="stylesheet" href="%%HTML%%/style.css" type="text/css">
</head>
<body background="%%HTML%%/images/bg_body.jpg">
<table width="500" border="0" align="center" cellpadding="0" cellspacing="0">
  <tr>
    <td><table width=500 cellspacing="0" cellpadding="0" border="0">
      <tr>
        <td width="32"><img src="%%HTML%%/images/logo.jpg"></td>
        <td width="468"><a href="http://www.annapolis-wireless.com/contact.html" target=_blank><img
src="%%HTML%%/images/banner.jpg"  border=0></a></td>
      </tr>
      <tr>
        <td bgcolor="#ad0006"></td>
        <td bgcolor="#ad0006"></td>
      </tr>
      <tr>
        <td><img src="%%HTML%%/images/photo1.jpg"></td>
        <td><img src="%%HTML%%/images/photo2.jpg"></td>
      </tr>
      <tr>
        <td colspan=2><h3>%%MOTD%%</h3></td>
      </tr>
    </table>
      <table width="500" border="0" cellspacing="0" cellpadding="0">
        <tr>
          <td width="200"><br>
            %%ERROR_MESSAGES%% <br>
            <br>
            %%LOGIN_FORM%%</td>
          <td width="300"><iframe scrolling="no" frameborder="0" width="300" height="250"
src="http://adserver.allcitywireless.com"></iframe></td>
        </tr>
      </table>
    <p> </p></td>
  </tr>
</table>
</body>
</html>
```

1.4.4.1 Using Images in Branding

On the B**randing Edit** page, there is also an area at the bottom of the screen that allows images to be uploaded for the branding. After uploading, the images can be referenced in any of the branding pages (except stylesheet) by using the following convention:

```
<img src=”%%HTML%%/images/imagename.gif”>
```

The i*magename.gif* is the name of the image to be displayed. The WiDirect will automatically replace %%HTML%% with the correct URL information. If the %%HTML%% keyword is not listed, the image will not be displayed correctly.

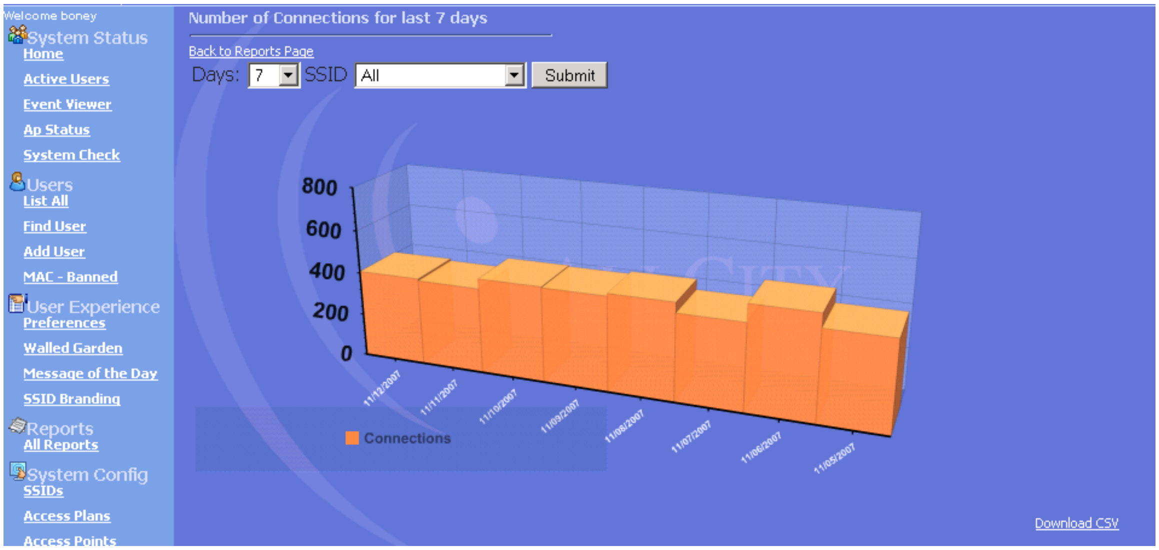
WARNING: Be careful about HTML construction. If unsure, Administrators can use the preview button to view what the branded pages look like.

Just about anything can be changed, including the login form by editing the Stylesheet portion of the branding. With the exception of the variables described in the previous section, any HTML code is valid in the branding pages. Unfortunately, listing all the possible HTML tags is outside the scope of this document. To learn more about HTML tags and page construction, see the guide at http://www.w3schools.com/html/

1.5 Reports

1.5.1 Functionality Overview

The WiDirect is able provide many reports that are useful in both budgeting and planning on future growth. It is also important to understand users as well as be able to reach out to them for marketing purposes. Reporting is an important part of understanding how much the network is used and where it is used the most. Reporting can also help find potential problems as well as monitoring anomalous behavior for either equipment or end users.



Number of Connections for last 7 days

Days: 7 SSID All

Figure 1-17: Sample Report Output

1.5.2 Connections

The connections report shows connections to a particular SSID in increments of 1 to 30 days, monthly, or annually. This is a representation of how many individuals presented user credentials and were permitted out onto the internet. An additional connections report is available that shows the manufacturer of the network cards of the users.

1.5.3 Registrations

Registration report is available in increments of 5 to 30 days, monthly, or annually. This report illustrates how many people signed up for an access plan in the given period.

1.5.4 Overall Usage

The **Overall Usage** tab indicates how much the network has been utilized by each user, which is sorted in descending order. It will give outputs based on both amount of bandwidth used and time spent on the system for any given date range.

1.5.5 Billing (Purchases)

The end user report that details which user signed up for service by username, the date and time they signed up, and the amount of money associated with the transaction. There is also a confirmation string given that is a unique identifier of the event. For payment gateways such as Authorize.Net, this string is the result code from the actual payment transaction. Otherwise, this string is a unique identifier for each purchase, including free plan purchases.

1.5.6 Access Point Usage

The **Access Point Usage Report** details the amount of usage an Access Point received over a time period. It reports both bandwidth and the amount of unique end users. This is important to understand if an AP is in a good location or perhaps it should be a candidate for deployment to a better used area.

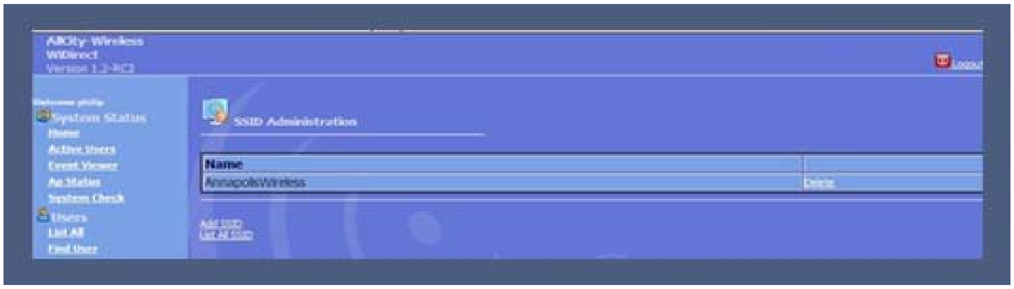
1.5.7 Downloads

Some reports are downloadable to CSV files. These reports include user account information, user e-mail accounts, and event reporting on several severity levels.

1.6 System Configuration

1.6.1 SSIDs

To control multiple SSIDs, they must be defined in the **System Configuration** area of the WiDirect user management console. Once the SSID is defined it, can use the standard preconfigured look and feel which it receives from the default settings or it can be customized for different networks or events.



Name	
AnnapolisWireless	Delete

Figure 1-18: Adding SSID

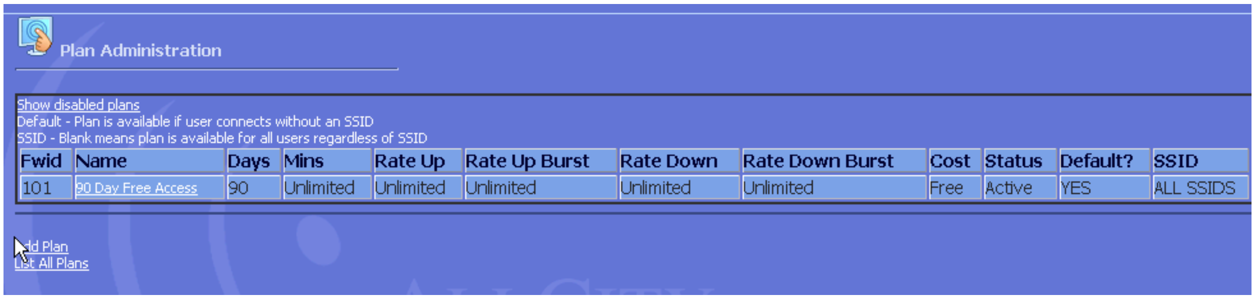
To edit the look and feel of an SSID, see the **Branding** discussion earlier in this document.

1.6.2 Access Plans

This page works in conjunction with the local user database and the **Captive Portal.** It allows end users to pick a plan for which they will be billed when they sign up and when they need to recharge their account. A plan is defined by the Administrator and restricts the amount of usage time a user can have.

1.6.2.1 Access Plans Page

The ***Access Plans*** page under the **System Configuration** menu lists the available access plans to end users. Figure 1-19 shows this page, which lists all the currently available plans. To create a new plan, click on the **Add Plan** link.



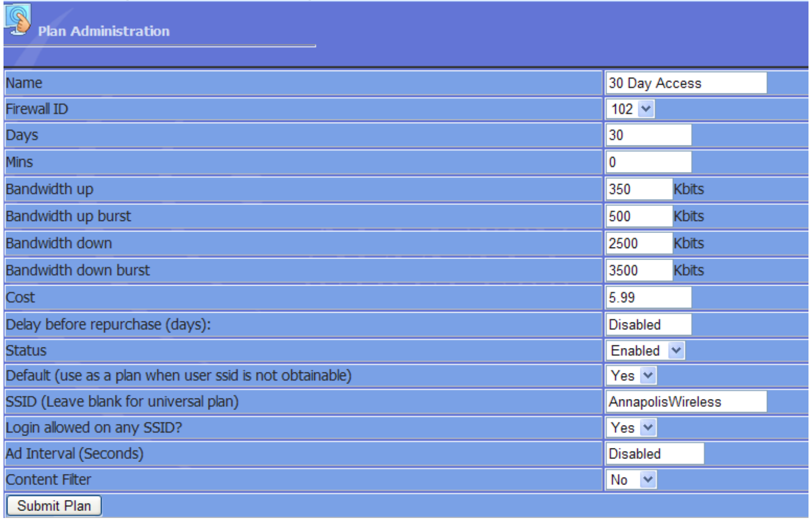
Default - Plan is available if user connects without an SSID
SSID - Blank means plan is available for all users regardless of SSID

Fwid	Name	Days	Mins	Rate Up	Rate Up Burst	Rate Down	Rate Down Burst	Cost	Status	Default?	SSID
101	90 Day Free Access	90	Unlimited	Unlimited	Unlimited	Unlimited	Unlimited	Free	Active	YES	ALL SSIDS

Figure 1-19: Access Plans

1.6.2.2 Adding a Plan

From the ***Access Plans*** page under the *System Configuration* menu, just click on the **Add Plan** link which is located under the list of current Access Plans. This brings up the ***Adding Access Plans*** page, which allows for detailed configuration of a plan. This page is shown in Figure 1-20.



Name	30 Day Access
Firewall ID	102
Days	30
Mins	0
Bandwidth up	350 Kbits
Bandwidth up burst	500 Kbits
Bandwidth down	2500 Kbits
Bandwidth down burst	3500 Kbits
Cost	5.99
Delay before repurchase (days):	Disabled
Status	Enabled
Default (use as a plan when user ssid is not obtainable)	Yes
SSID (Leave blank for universal plan)	AnnapolisWireless
Login allowed on any SSID?	Yes
Ad Interval (Seconds)	Disabled
Content Filter	No

Figure 1-20: Plan Creation

If there is only one free plan defined in the system for a given SSID, users will not be given a choice of plan selection. They will be automatically assigned to the single plan.

Table 1-5 describes all the fields for plan creation.

Keyword	**Description**
Name	A descriptive name for the plan. This name is displayed to users on the plan selection page. (alphanumeric field, 1 – 100 characters)
Firewall ID	A unique ID for each plan from 101 to 200 (numeric field, 3 characters). If unsure, use the default number given.
Days	Number of days duration a plan is valid for (numeric field, possible values 0 – 999, 0= unlimited)
Minutes	Number of minutes duration a plan is valid for. **Note**: Do not use minutes if the days setting is being used. This is only used for plans that can be expressed in terms of minutes, such as 1 hour account access plans. (Numeric field, possible values 0 – 999, 0= unlimited)
Bandwidth Up	Bandwidth limitation in kbps a user is allowed to upload from their machine. (numeric field, unit of measure: kbps, 0= unlimited)
Bandwidth Up Burst	Bandwidth in kbps a user is allowed to use if extra bandwidth is available. (No one else is using the system) For example, you might have a 200 up limit but a 400 burst limit, which gives users extra bandwidth if available. In most cases, set this value to the same as the bandwidth up setting. **WARNING**: Do not set Bandwidth Up Burst to a value lower than Bandwidth Up setting. (numeric field, unit of measure: kbps, 0= unlimited)
Bandwidth	Same as bandwidth limitation as Bandwidth Up, but for defining download speeds.

Down	Measured in kbps 1024 would equal 1 megabits (numeric field, unit of measure: kbps, 0= unlimited)
Bandwidth Down Burst	Same as bandwidth limitation as Bandwidth Up Burst, but for defining download speeds. Measured in kbps 1024 would equal 1 megabits (numeric field, unit of measure: kbps, 0= unlimited)
Cost	The amount the user must pay in order to receive the plan. If set to zero, the plan will be "Free". (currency field, unit of measure: USD, 0= free) **Note**: To collect payment via the WiDirect, the payment gateways must also be configured.
Default	If the plan is set to default and if no user SSID is available or the user's SSID doesn't match any plans that are configured specifically for a SSID, this plan will be available to the user.
SSID	Applies this plan to a specific SSID, or leave blank if the plan applies to all SSIDS
Ad Interval	The number of seconds in between the display of the advertisement page. Postproxy must be enabled in the firewall configuration file for this feature to work. See section 1.7.4.1 for more details.
Content Filter	Whether or not content filtering is disabled. Postproxy must be enabled in the firewall configuration file for this feature to work. See section 1.7.4.1 for more details.
Login Allowed on any SSID	If this option is set to Yes, an account created with this access plan can be used on any SSID in the network. If both this option and the Default option are set to No, then accounts created on this access plan will only be able to login on the SSID specified in the SSID field.
Delay Before Repurchase	This option is to limit the frequency that a user may reselect an access plan. Setting this value to 30 would only allow the access plan to be selected once per month.

Table 1-5: Plan creation fields.

1.6.3 Access Points

From the ***System Configuration->Access Points*** menu, this page allows administrators to list all the Access Points for their network. By entering an Access Point, the WiDirect is able to monitor and configure the access point. This page lists all the currently configured Access Points, as shown in Figure 1-21.

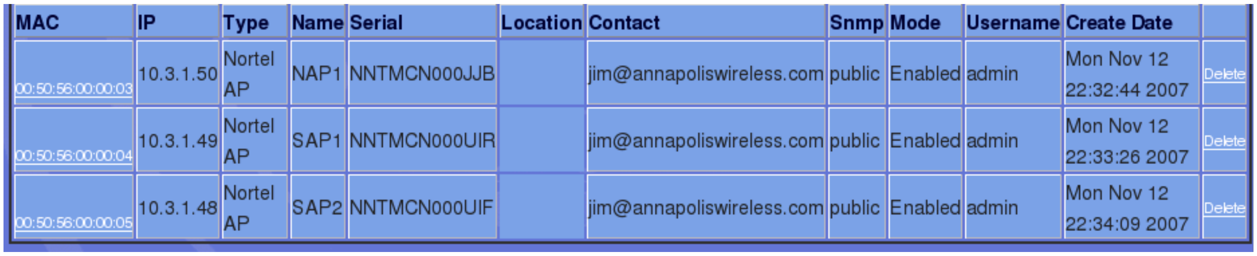
Adding access points to the system enhances future troubleshooting and configuration. For example, on Nortel networks, it is very important to properly configure the Radius configuration files. By taking the time and entering all the AP information requested on this page, the WiDirect can use this information to assist during the Radius configuration step. For example, in the WiDirect helps the administrator build Radius files based off the serial number of the Access Point.

On the main access point page, administrators can edit or add new Access Points. By clicking on an Access Point or clicking **Add New Access Point**, an **Access Point Edit** page will be displayed as shown in Figure 1-22. Table 1-6 describes all the possible values for this page.

Keyword	**Description**
MAC	The MAC address of the AP. This must be unique across all access points. The MAC can frequently be obtained from a sticker on the AP. **REQUIRED**
IP	The IP that the system will use to ping the AP, such as 10.3.1.50. This field MUST be filled in with a valid IP address for monitoring and data collection. **REQUIRED**
Alternate IP	This optional field is used to specify a secondary IP address for the access point. When

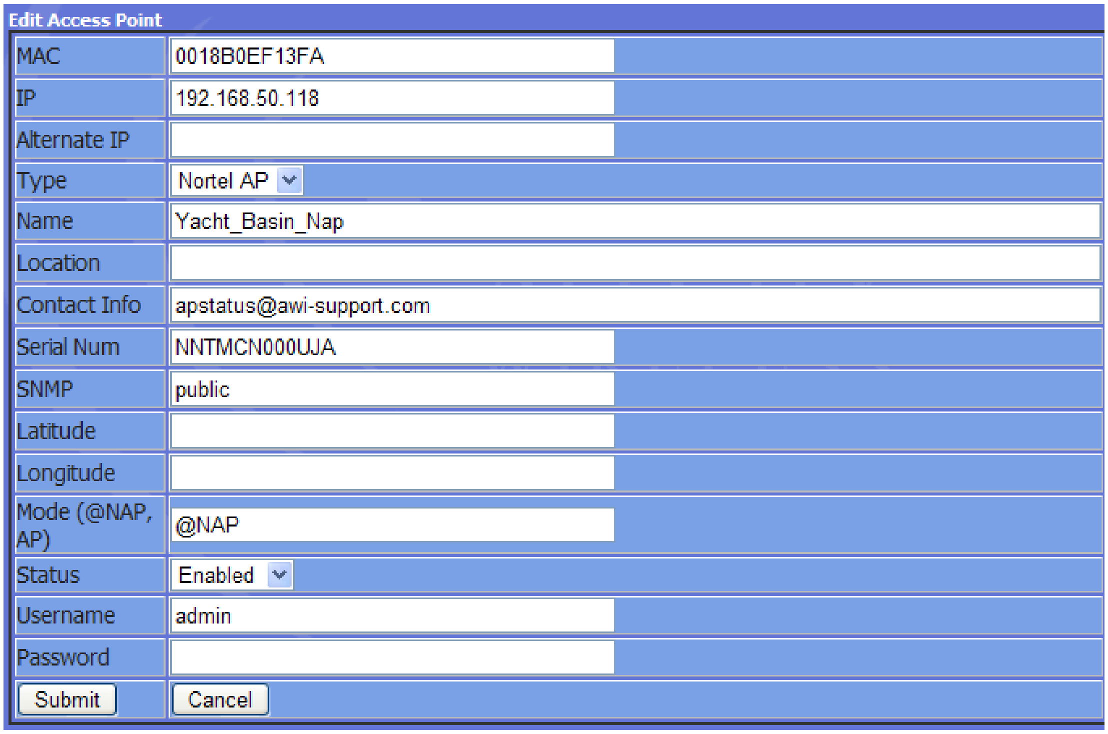
	using Tropos access points, this field is required on any access points that are connected directly to the WiDirect.
Type	Set's the AP type. Choices: Nortel, Proxim, Tropos, BelAir, EnGenius, Other. Some access points have an automatic configuration option as well. If that option is chosen the WiDirect will automatically configure the access point.
Name	A descriptive name of the AP. This field should be kept relatively short (10-20 characters), because it is used in the TL graphing pages and visual management components. **REQUIRED**
Location	A description of the AP, used only on the configuration page.
Contact Info	Email address of the user who should get emailed on an up/down event. If no email address is defined, no email will be sent on up/down events.
Serial Num	The access point's serial number, NNTMNO000UD (example) For Nortel access points, this is required to generate the keys in the radius file. **REQUIRED**
SNMP	The SNMP public community string. If unsure, use the default of "public".
Latitude	Location of the AP, used only on the configuration page.
Longitude	Location of the AP, used only on the configuration page.
Mode	This Field identifies the access point as being connected to network backhaul (@NAP) or as a standard meshing access point (SAP) **REQUIRED**
Status	Dropdown field for defining the operational status of an access point (enabled / disabled) If an AP is 'disabled', it will not be monitored by the WiDirect. **REQUIRED**
Username	This field tells the WiDirect the telnet/web username for the Access Point. The default Nortel username is 'admin'
Password	This field tells the WiDirect the telnet/web password for the Access Point. The default Nortel password is 'admin'. When editing an access point this field can be left blank for the password to remain the same.

Table 1-6: Keywords and Descriptions for Access Points



MAC	IP	Type	Name	Serial	Location	Contact	Snmp	Mode	Username	Create Date	
00:50:56:00:00:03	10.3.1.50	Nortel AP	NAP1	NNTMCN000JJB		jim@annapoliswireless.com	public	Enabled	admin	Mon Nov 12 22:32:44 2007	Delete
00:50:56:00:00:04	10.3.1.49	Nortel AP	SAP1	NNTMCN000UIR		jim@annapoliswireless.com	public	Enabled	admin	Mon Nov 12 22:33:26 2007	Delete
00:50:56:00:00:05	10.3.1.48	Nortel AP	SAP2	NNTMCN000UIF		jim@annapoliswireless.com	public	Enabled	admin	Mon Nov 12 22:34:09 2007	Delete

Figure 1-21: Access Points



Edit Access Point

MAC	0018B0EF13FA
IP	192.168.50.118
Alternate IP	
Type	Nortel AP
Name	Yacht_Basin_Nap
Location	
Contact Info	apstatus@awi-support.com
Serial Num	NNTMCN000UJA
SNMP	public
Latitude	
Longitude	
Mode (@NAP, AP)	@NAP
Status	Enabled
Username	admin
Password	

Figure 1-22: Adding a New Access Point

1.6.4 WiDirect Clients and WCMS

Each WiDirect client controls discontinuous or geographically separated networks over the Internet using WCMS. All user management is handled by the central WiDirect Auth server, but after a user is authenticated all their traffic goes straight from the WiDirect Client to the Internet. If one client goes down, only the people connected to that client are affected.

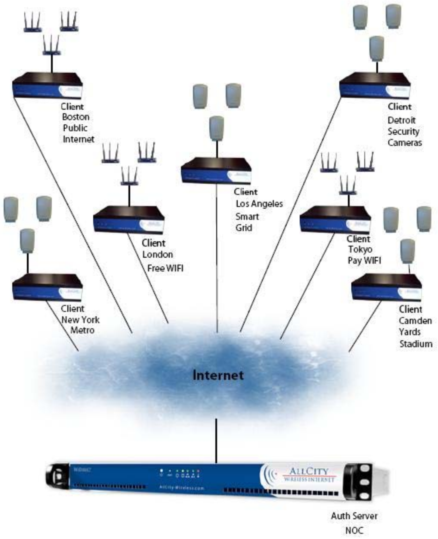
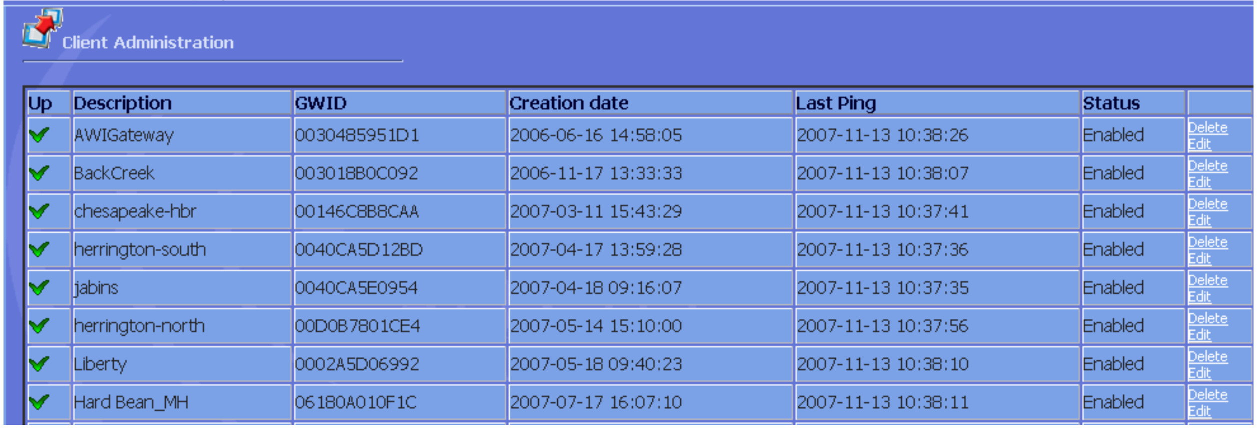


Figure 1-23 Example WiDirect Network

Figure 1-23 shows an example of a network with a WiDirect and WiDirect client at remote locations. Even though each of these clients lies on a separate network, they can all be setup to connect to the central WiDirect authentication server, which allows a common user base to be defined across all the WiDirect Wireless networks. To the user, all the WiDirect networks appear to be under a single entity.

To configure the list of WiDirect clients, click WiDirect Clients under the System Configuration menu. To add a new client, click the **Add a Client** link at the bottom of the WCMS ***Client Administration*** page. Table 1-7 lists all the fields for this page.



Up	Description	GWID	Creation date	Last Ping	Status	
✓	AWIGateway	0030485951D1	2006-06-16 14:58:05	2007-11-13 10:38:26	Enabled	Delete Edit
✓	BackCreek	003018B0C092	2006-11-17 13:33:33	2007-11-13 10:38:07	Enabled	Delete Edit
✓	chesapeake-hbr	00146C8B8CAA	2007-03-11 15:43:29	2007-11-13 10:37:41	Enabled	Delete Edit
✓	herrington-south	0040CA5D12BD	2007-04-17 13:59:28	2007-11-13 10:37:36	Enabled	Delete Edit
✓	jabins	0040CA5E0954	2007-04-18 09:16:07	2007-11-13 10:37:35	Enabled	Delete Edit
✓	herrington-north	00D0B7801CE4	2007-05-14 15:10:00	2007-11-13 10:37:56	Enabled	Delete Edit
✓	Liberty	0002A5D06992	2007-05-18 09:40:23	2007-11-13 10:38:10	Enabled	Delete Edit
✓	Hard Bean_MH	06180A010F1C	2007-07-17 16:07:10	2007-11-13 10:38:11	Enabled	Delete Edit

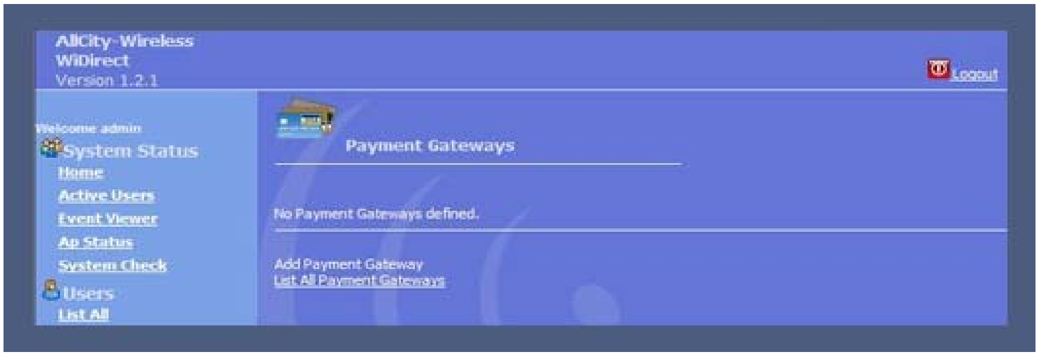
Figure 1-24: WiDirect Clients Page

Keyword	**Description**
Description	The name of the WiDirect server. The built in “local” client is always named Local WiDirect.
Location	Text that describes the physical location of the WiDirect client.
Contact Info	Email address of the administrator that should be emailed when up/down events occurs for the client.
GWID	This is a unique identifier for each WiDirect. This field MUST be entered in correctly for WiDirect communication to occur. The GWID value is the MAC address of ETH1 interface without the colons. For example, if the MAC address of ETH1 was 00:00:0A:BC:DE:1F, the GWID value would be 00000ABCDE1F.
Status	Provides the enabled/disabled of the WiDirect.

Table 1-7: WiDirect Client Fields

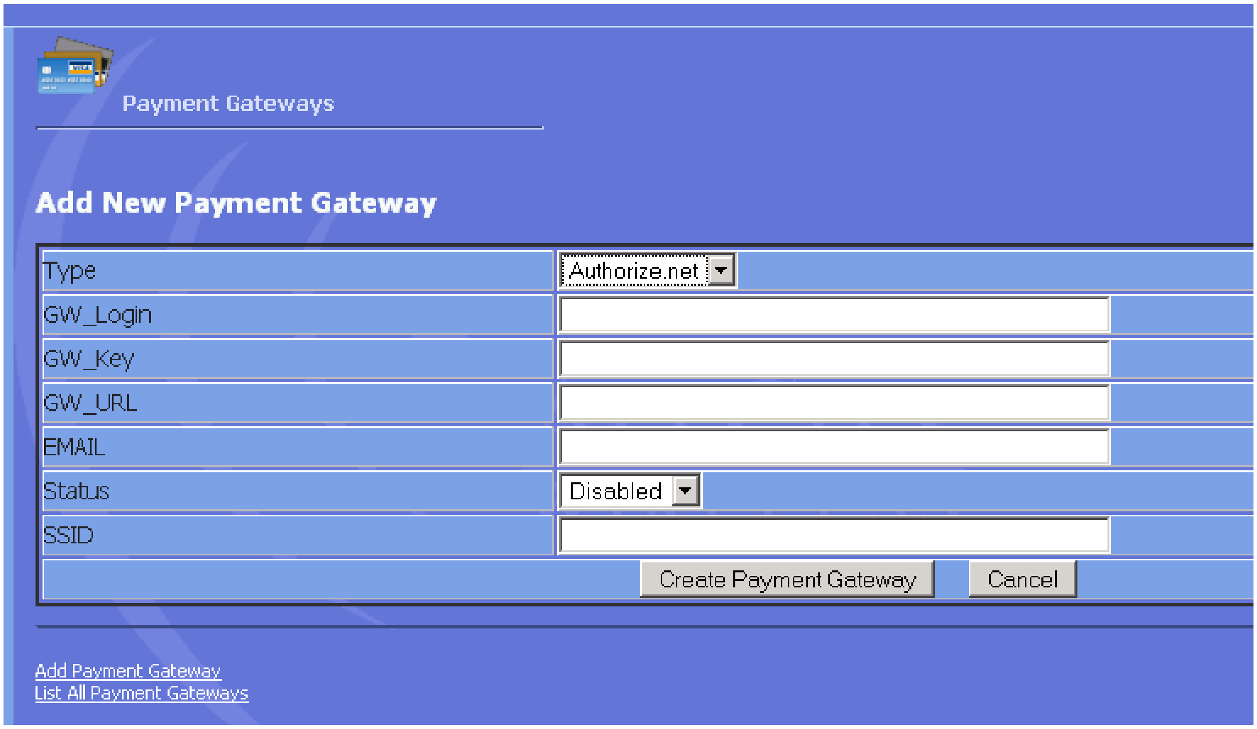
1.6.5 Payment Gateways

The ***Payment Gateways*** page under the ***System Configuration*** menu allows for defining and managing payment gateways, such as PayPal or Authorize.net. Once at the **Payment Gateways** page, click **Add Payment Gateway** to add a new Payment Gateway.



No Payment Gateways defined.

Figure 1-25: Payment Gateways



Type	Authorize.net
GW_Login	
GW_Key	
GW_URL	
EMAIL	
Status	Disabled
SSID	

Figure 1-26: Adding Payment Gateway

From this page, just select the type of payment desired, which is a drop down list next to the **Type** slot. Fill in the rest of the information remembering to click the **Create Payment Gateway** button at the bottom when finished.

Administrators can also choose to look at the available Payment Gateways by the clicking on the **List All Payment Gateways** link at the bottom of the ***Payment Gateways*** page.

Keyword	**Description**
Type	Paypal/Authorize.Net. Defines which payment gateway to use.
GW_Login	"Login" key provided by Authorize.Net For PayPal, this will be the email address of the account.
GW_Key	"Key" Value provided by Authorize.Net Not used for PayPal
GW_URL	The URL to authenticate the transaction. For example, for Authorize.NET, this URL will

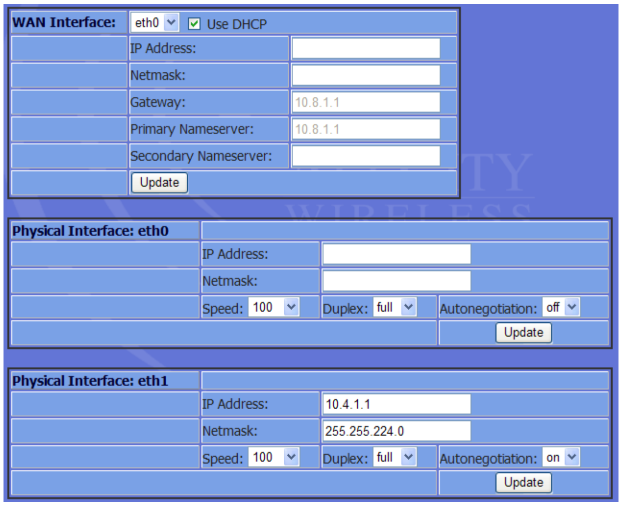
	typically be https://secure.authorize.net/gateway/transact.dll. For PayPal, this will be https://www.paypal.com/cgi-bin/webscr.
Email	The email address of the account that is registered with the payment gateway.
Status	Enabled or Disabled. When a gateway is disabled, it will not be presented to the user as a payment option.
SSID	The SSID that the payment plan is used. If this field is blank, the payment gateway will be available for all SSIDs.

Table 1-8: Fields for adding payment gateways.

Once the forms are all filled out, click **Create Payment Gateway** to activate this payment gateway.

PayPal Note:
In order for PayPal to work properly, the VALIDATION_PUBLIC_WEB_IP in the preferences section must be set to the public IP address of the WiDirect. This is because the PayPal server makes a separate return call for each transaction called the IPN.

1.6.6 Network Configuration



WAN Interface: eth0 ☑ Use DHCP

IP Address:

Netmask:

Gateway: 10.8.1.1

Primary Nameserver: 10.8.1.1

Secondary Nameserver:

Physical Interface: eth0

IP Address:

Netmask:

Speed: 100 Duplex: full Autonegotiation: off

Physical Interface: eth1

IP Address: 10.4.1.1

Netmask: 255.255.224.0

Speed: 100 Duplex: full Autonegotiation: on

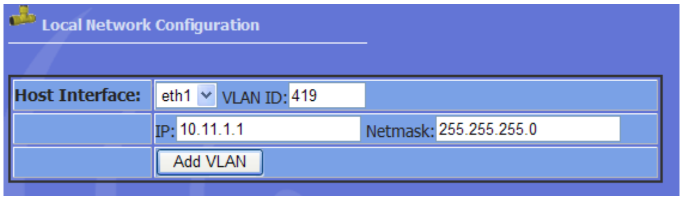
Figure 1-27: Network Configuration

Accurate network configuration IP addressing is critical to the proper operation of the WiDirect. All network configuration and routing configuration is controlled via the ***Network Configuration*** page under the *System Configuration* menu. Figure 1-27 shows the **Network Configuration** window.

This page allows configuration of the WiDirect interfaces, the default route and the DNS servers. The first section allows the administrator to set which interface is to be used as the WAN interface. By default the WAN interface is ETH0. If DHCP is enabled the Default Route and DNS server fields will be disabled, because that information will be retrieved via DHCP.

By default the ETH0 interface is configured for DHCP, while the ETH1 interface uses the standard 10.4.1.1 addressing scheme. IP addresses are not set for ETH2 or ETH3.

The bottom of the Network Configuration page has buttons to add a VLAN interface or a subinterface. A VLAN can be used on any interface to help separate users on the network. A subinterface is a secondary IP on the interface that will be on the same local network as the main interface IP address. The pages to add a VLAN or Subinterface are shown in Figures 1-28 and 1-29. To add a VLAN or subinterface you must enter an IP address, netmask, and an ID number from 1 to 4095.

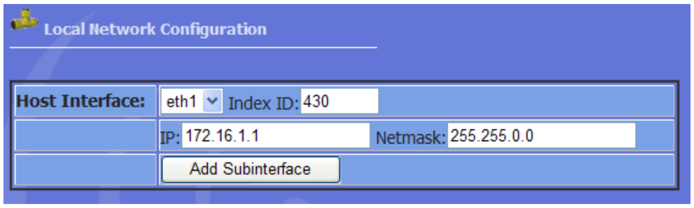


Local Network Configuration

Host Interface: eth1 VLAN ID: 419

IP: 10.11.1.1 Netmask: 255.255.255.0

Figure 1-28: Create VLAN Interface



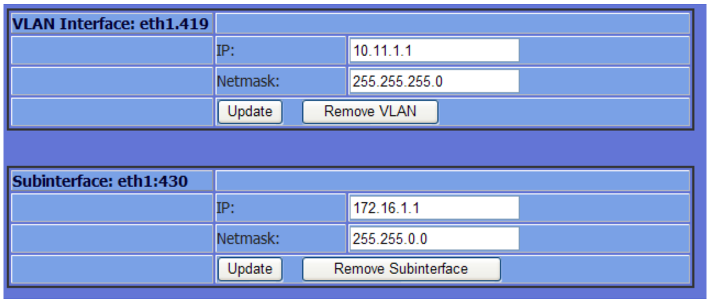
Local Network Configuration

Host Interface: eth1 Index ID: 430

IP: 172.16.1.1 Netmask: 255.255.0.0

Fiaure 1-29: Create Subinterface

After the interfaces have been added they will show up on the ***Network Configuration*** page. From there the interfaces can either be updated or deleted.



VLAN Interface: eth1.419

IP: 10.11.1.1

Netmask: 255.255.255.0

Subinterface: eth1:430

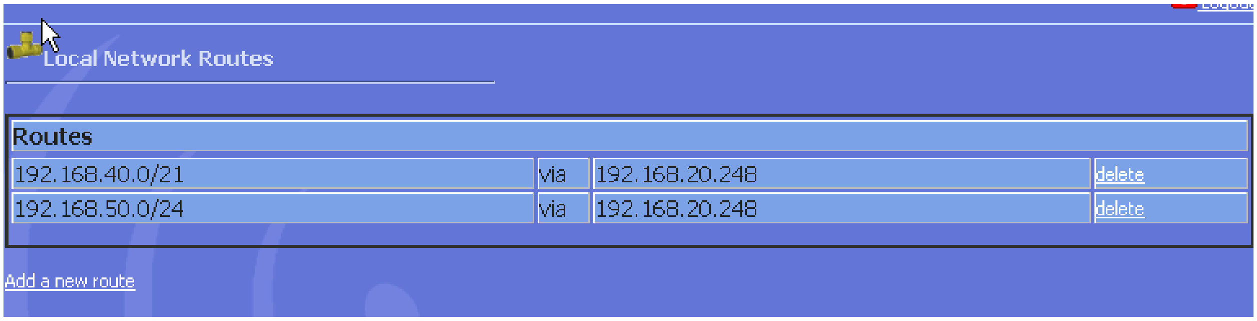
IP: 172.16.1.1

Netmask: 255.255.0.0

Figure 1-30: Network Configuration Page

1.6.7 Network Routing

Static routing can be configured via the administrative GUI interface in the ***Network Routing*** page under the ***System Configuration*** menu.



Local Network Routes

Routes			
192.168.40.0/21	via	192.168.20.248	delete
192.168.50.0/24	via	192.168.20.248	delete

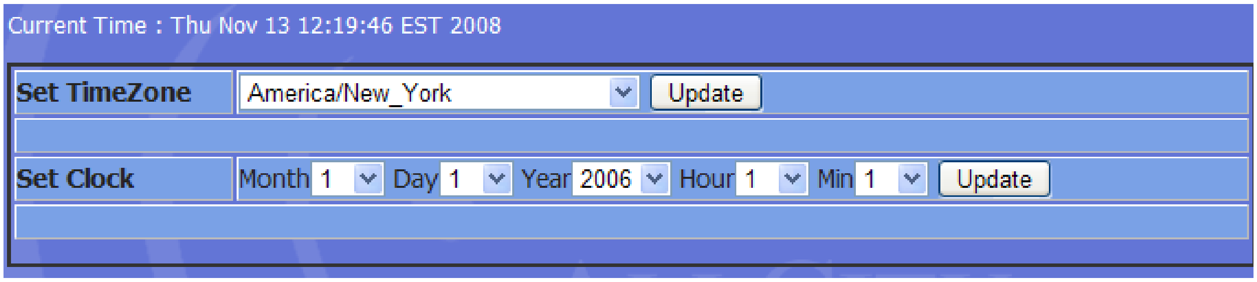
Add a new route

Figure 1-31: Network Routing Page

To add a route, simply click on **Add a Route** at the bottom of the screen. Fill in the information required and click the **Submit** button.

1.6.8 Date and Time

Select *Date and Time* under the System Configuration menu. From the drop down menus, set the time zone, date and time. Don't forget to click the **Update** button next to the appropriate commands to implement your selections.



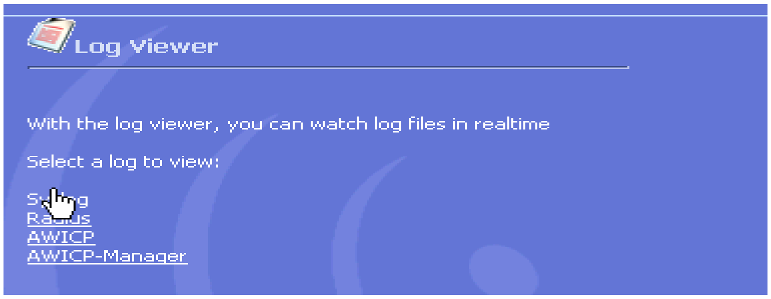
Current Time : Thu Nov 13 12:19:46 EST 2008

Set TimeZone	America/New_York Update
Set Clock	Month 1 Day 1 Year 2006 Hour 1 Min 1 Update

Figure 1-32: Date and Time

1.6.9 Log Viewer

With the ***Log Viewer*** page, located under the System Configuration menu, log file scan be viewed in real-time. Choose the appropriate log file by clicking on the link and a separate screen opens to view the log. This page will update as new entries are being added to the log file.



Log Viewer

With the log viewer, you can watch log files in realtime

Select a log to view:

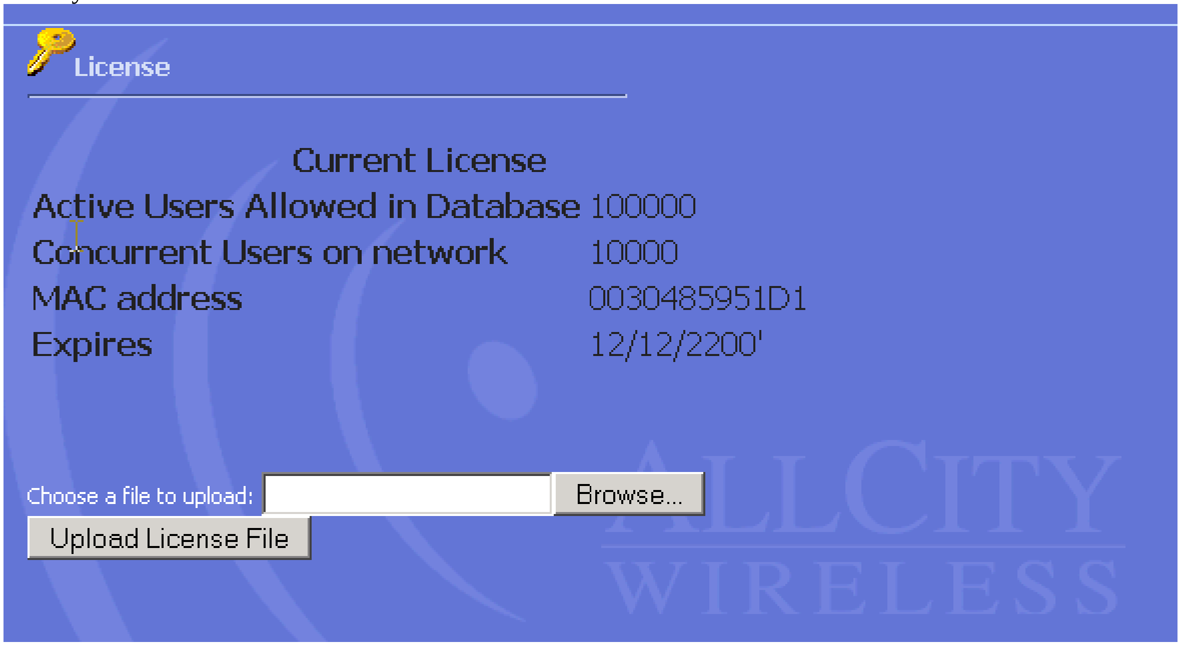
Syslog
Radius
AWICP
AWICP-Manager

Figure 1-33: Log Viewer

1.6.10 License Key

The WiDirect comes preconfigured with a certain number of user licenses depending on the WiDirect model. There are two types of user classifications for licenses; **Active Users** and **Concurrent Users**. An Active User is a user that has been registered and is eligible to use the network. Users that have been disabled or expired do count towards the **Active User** count. **Concurrent Users** are the total number of users that can be using the system simultaneously at a given time. Once the maximum number of concurrent users has been reached, new users must wait for a currently connected user to disconnect before using the network.

If needed, new license keys can be added to the WiDirect. To add new licenses, select ***License Key*** under the ***System Configuration*** menu. Browse to the directory where the license file is located on the local machine and then click **Upload**. The WiDirect will add the new license files to the database and the end user counts will be reflected in the license key tab.



License

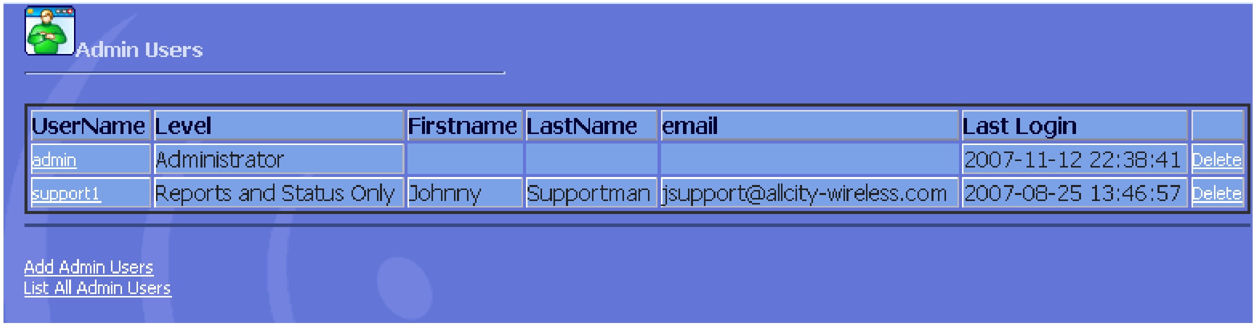
Current License

Active Users Allowed in Database	100000
Concurrent Users on network	10000
MAC address	0030485951D1
Expires	12/12/2200'

Figure 1-34: License Key

Depending on usage of the system and the license that was originally purchased, a new license may need to be purchased to support more users. Contact support at AllCity Wireless if a new license is required.

1.6.11 Admin Users



Admin Users

UserName	Level	Firstname	LastName	email	Last Login	
admin	Administrator				2007-11-12 22:38:41	Delete
support1	Reports and Status Only	Johnny	Supportman	jsupport@allcity-wireless.com	2007-08-25 13:46:57	Delete

Add Admin Users
List All Admin Users

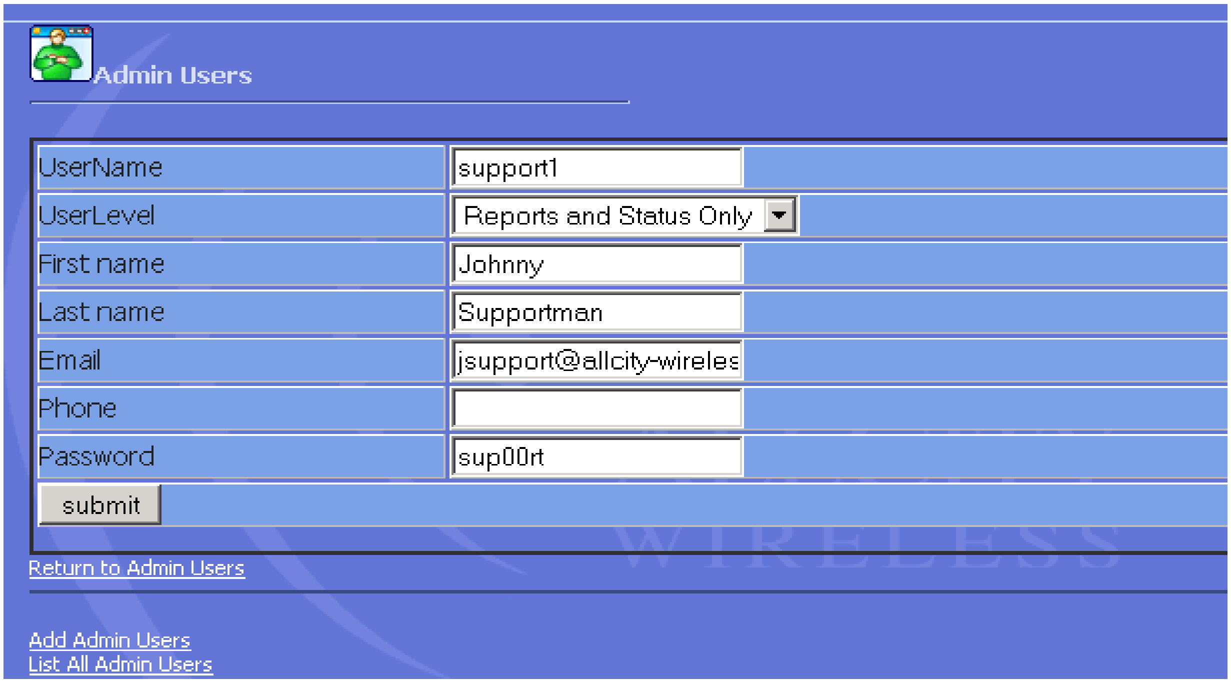
Figure 1-35: Admin Users

The ***Admin Users*** page allows the administrator to add and remove administrative accounts, change access levels, contact information, or even reset passwords.

Opening ***Admin Users*** under the ***System Configuration*** menu shows the list of administrators for the WiDirect device. Each administrator is assigned a user level that defines his/her access restrictions. Each administrator can have full (Administrator) or restricted (Report and Status Only) access to the administrative areas within the WiDirect.

1.6.11.1 Add New Administrator

In the ***User Admin*** screen of the WiDirect (pictured above), click on **Add Admin User**.



Admin Users

UserName	support1
UserLevel	Reports and Status Only
First name	Johnny
Last name	Supportman
Email	jsupport@allcity-wireles
Phone	
Password	sup00rt

Return to Admin Users

Add Admin Users
List All Admin Users

Figure 1-36: Add New Administrator

Fill in all the fields and click the **Add User** button. All fields should be self explanatory with the exception of User Level, which is described in the next section.

1.6.11.2 Change User Level

The customer can change any Administrator's role by selecting the desired new role from the drop down menu after clicking on the user's name and going into their profile. There are two user levels; ***Administrator*** and ***Reports & Status Only***. An ***Administrator*** level user has complete and total access to the WiDirect GUI system. A ***Reports & Status*** user can only view/edit WiDirect users, run status checks, and reports. The ***Reports & Status*** level user is a good setting for phone support staff.

1.6.11.3 Change Password

Each Administrator has a password that allows him or her access to the management console. To change the Administrator's password, enter the new password in the text box then click on the **Submit** button. A full access Administrator can change other administrator's passwords.

1.6.11.4 Delete

Select this button if you want to delete an administrator.

WARNING: **Never delete the admin user.** Instead changed the password to something unique and keep it in a safe location. All administrators should have their own unique usernames and passwords.

1.6.12 Shutdown

The ***Shutdown*** page, listed under the ***System Configuration*** menu, allows the Administrator to remotely shutdown or reboot the WiDirect unit. The appliance should never be powered off by disconnecting the power supply.

The shutdown procedure should be run to make sure that the file systems are correctly unmounted. If the WiDirect is not properly shutdown, it will cause a longer startup sequence the next time the WiDirect is powered up.

WARNING: Use this function with caution. Once the WiDirect unit is remotely shutdown, it can not be restarted unless someone has physical access to it.

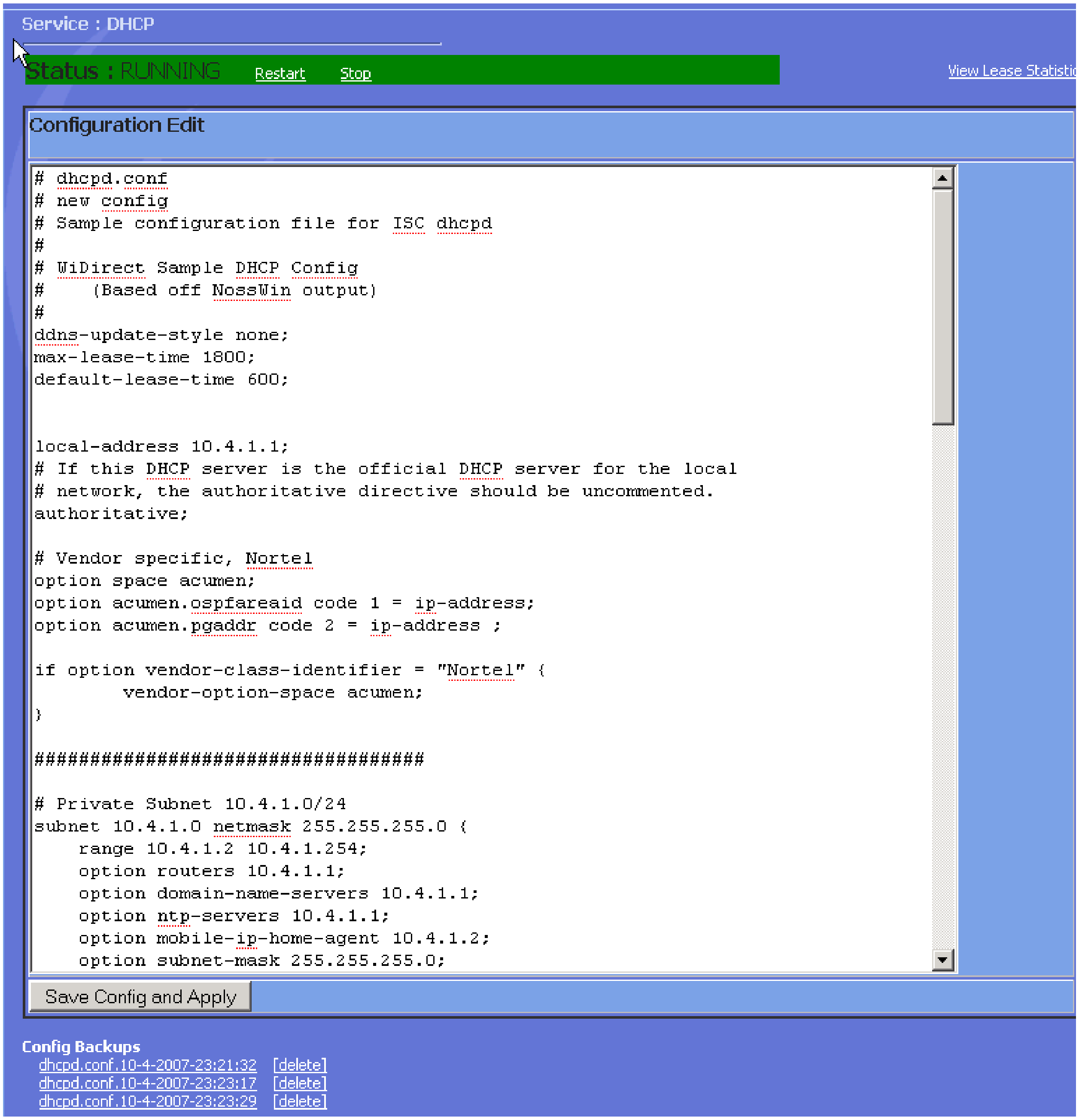
1.6.13 Support

The ***Support*** page under the ***System Configuration*** menu displays the contact information you can use to contact a WiDirect professional in case you have additional questions. (Contact information is also listed at the end of this Manual.)

1.7 Services Menu

1.7.1 DHCP

The WiDirect provides DHCP services to all available LAN interfaces. Multiple subnets may be defined for each LAN interface and each subnet has a definable DHCP lease address range associated with it. DHCP can be disabled on some subnets and enabled on others. Providing DHCP services on multiple subnets makes network administration easier because static addressing is not required on either subnet. DHCP can be configured to assign a given hardware Ethernet address (MAC) the same IP every time.



```
# dhcpd.conf
# new config
# Sample configuration file for ISC dhcpd
#
# WiDirect Sample DHCP Config
#     (Based off NossWin output)
#
ddns-update-style none;
max-lease-time 1800;
default-lease-time 600;


local-address 10.4.1.1;
# If this DHCP server is the official DHCP server for the local
# network, the authoritative directive should be uncommented.
authoritative;

# Vendor specific, Nortel
option space acumen;
option acumen.ospfareaid code 1 = ip-address;
option acumen.pgaddr code 2 = ip-address ;

if option vendor-class-identifier = "Nortel" {
        vendor-option-space acumen;
}

###################################

# Private Subnet 10.4.1.0/24
subnet 10.4.1.0 netmask 255.255.255.0 {
    range 10.4.1.2 10.4.1.254;
    option routers 10.4.1.1;
    option domain-name-servers 10.4.1.1;
    option ntp-servers 10.4.1.1;
    option mobile-ip-home-agent 10.4.1.2;
    option subnet-mask 255.255.255.0;
```

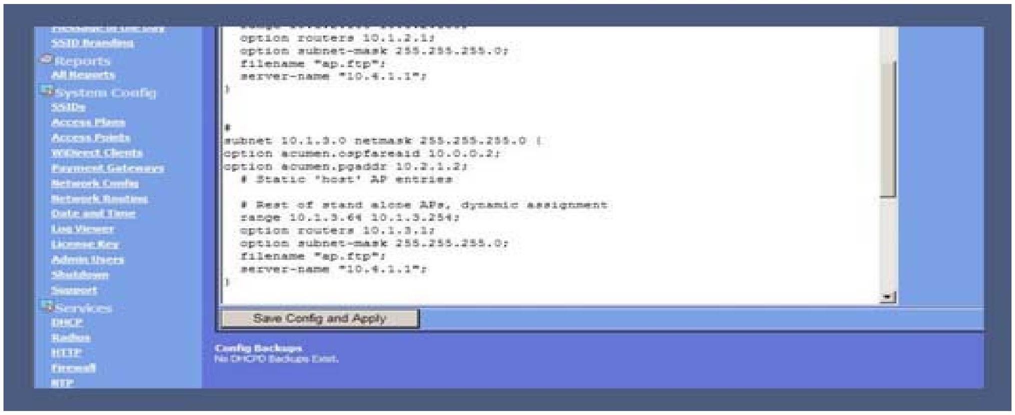
Config Backups
dhcpd.conf.10-4-2007-23:21:32 [delete]
dhcpd.conf.10-4-2007-23:23:17 [delete]
dhcpd.conf.10-4-2007-23:23:29 [delete]

Figure 1-37: DHCP Service

To Edit the DHCP table click on ***DHCP*** under the ***Services*** menu. The entire DHCP configuration file will be presented in an editable text field, as shown in Figure 1-37.

Once the configuration has changed, use the **Save Config and Apply** to save the changes. This button is shown in Figure 1-38. The WiDirect automatically stores a retrievable backup of the file.

The WiDirect uses a standard version of DHCP that can be modified to suit any network environment. To learn about all the configuration items for this file, consult the ISC DHCP documentation at:
http://www.isc.org/products/DHCPD



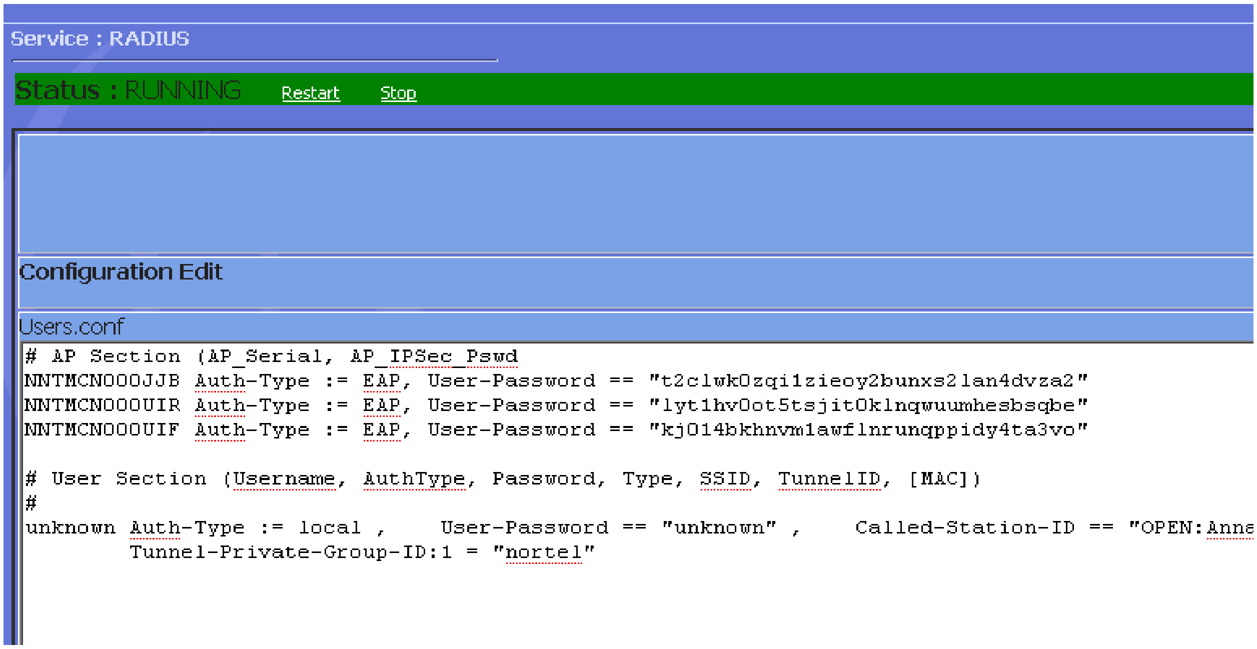
```
  option routers 10.1.2.1;
  option subnet-mask 255.255.255.0;
  filename "ap.ftp";
  server-name "10.4.1.1";
}


#
subnet 10.1.3.0 netmask 255.255.255.0 {
option acumen.ospfareaid 10.0.0.2;
option acumen.pgaddr 10.2.1.2;
  # Static 'host' AP entries

  # Rest of stand alone APs, dynamic assignment
  range 10.1.3.64 10.1.3.254;
  option routers 10.1.3.1;
  option subnet-mask 255.255.255.0;
  filename "ap.ftp";
  server-name "10.4.1.1";
}
```

Config Backups
No DHCPD Backups Exist.

Figure 1-38: DHCP 'Save Config & Apply' Button

1.7.2 Radius

To generate Radius files for Nortel Access Points, go to the ***Services*** menu and click on ***Radius***, which open a Radius edit window as shown in Figure 1-39.



```
# AP Section (AP_Serial, AP_IPSec_Pswd
NNTMCN000JJB Auth-Type := EAP, User-Password == "t2clwk0zqi1zieoy2bunxs2lan4dvza2"
NNTMCN000UIR Auth-Type := EAP, User-Password == "lyt1hv0ot5tsjit0klnqwuumhesbsqbe"
NNTMCN000UIF Auth-Type := EAP, User-Password == "kj014bkhnvm1awflnrunqppidy4ta3vo"

# User Section (Username, AuthType, Password, Type, SSID, TunnelID, [MAC])
#
unknown Auth-Type := local ,    User-Password == "unknown" ,    Called-Station-ID == "OPEN:Anne
        Tunnel-Private-Group-ID:1 = "nortel"
```

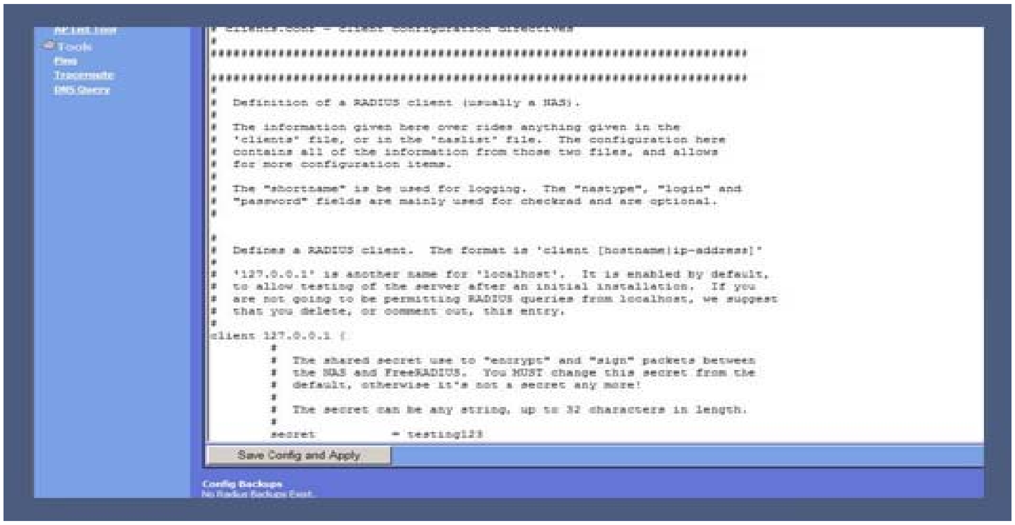
Figure 1-39: Configuring Radius

The only two Radius files that are editable through the GUI are users.conf and clients.conf. For most deployments, the only file that needs to be edited is the users.conf file, which provides the Nortel Authorization information as well as the VPN tunnel information. The only thing covered in this documentation is the Authorization portion. All the rest of the Radius configuration is beyond the scope of this documentation. If more information is required on the Radius configuration, please consult All City Wireless support site.

As with all the other service pages, a backup copy of the configuration that was modified will be saved automatically once the **Save Config and Apply** button at the bottom of the screen is clicked.

Another feature of this page is the **Generate New Nortel Data** helper button. When this button is clicked, another page is generated that shows all the correct User-Passwords for Nortel Access Points. If the Access Points have been added to the WiDirect, they will be displayed at this time. This helper window allows administrators to cut-and-paste the output into the users.conf section of the radius file. Without this tool, configuring Radius for Nortel can be a very difficult process.

Once the new Access Points are added to the users.conf file, click on the **Save Config And Apply** button, which automatically saves a backup of the configurations and immediately applies the new configuration to the Radius service.



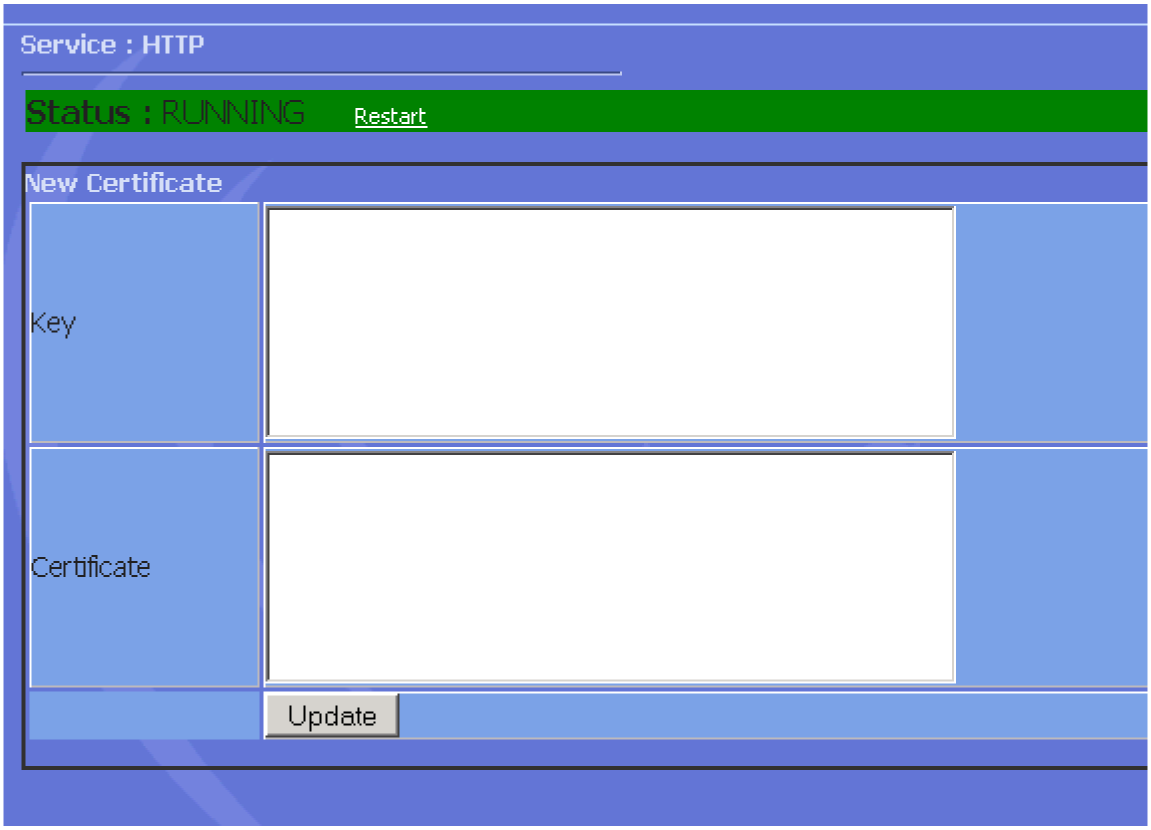
```
# clients.conf - client configuration directives
#
############################################################################

############################################################################
#
#  Definition of a RADIUS client (usually a NAS).
#
#  The information given here over rides anything given in the
#  'clients' file, or in the 'naslist' file.  The configuration here
#  contains all of the information from those two files, and allows
#  for more configuration items.
#
#  The "shortname" is be used for logging.  The "nastype", "login" and
#  "password" fields are mainly used for checkrad and are optional.
#


#
#  Defines a RADIUS client.  The format is 'client [hostname|ip-address]'
#
#  '127.0.0.1' is another name for 'localhost'.  It is enabled by default,
#  to allow testing of the server after an initial installation.  If you
#  are not going to be permitting RADIUS queries from localhost, we suggest
#  that you delete, or comment out, this entry.
#
client 127.0.0.1 {
        #
        #  The shared secret use to "encrypt" and "sign" packets between
        #  the NAS and FreeRADIUS.  You MUST change this secret from the
        #  default, otherwise it's not a secret any more!
        #
        #  The secret can be any string, up to 32 characters in length.
        #
        secret          = testing123
```

No Radius Backups Exist.

Figure 1-40: Radius Save Config and Apply

1.7.3 HTTP

To add a HTTP key or Certificate, go to the ***Services*** menu and click ***HTTP***.   This page allows an administrator to enable SSL for the WiDirect.


Service : HTTP

Status : RUNNING

Figure 1-41: HTTP Management

While this page also has a **Restart** button at the top, which allows the HTTP service to be restarted, there are no **Stop** or **Start** buttons on this page. If the HTTP process was ever stopped, access to the Admin and user login pages would be impossible without a reboot of the WiDirect.

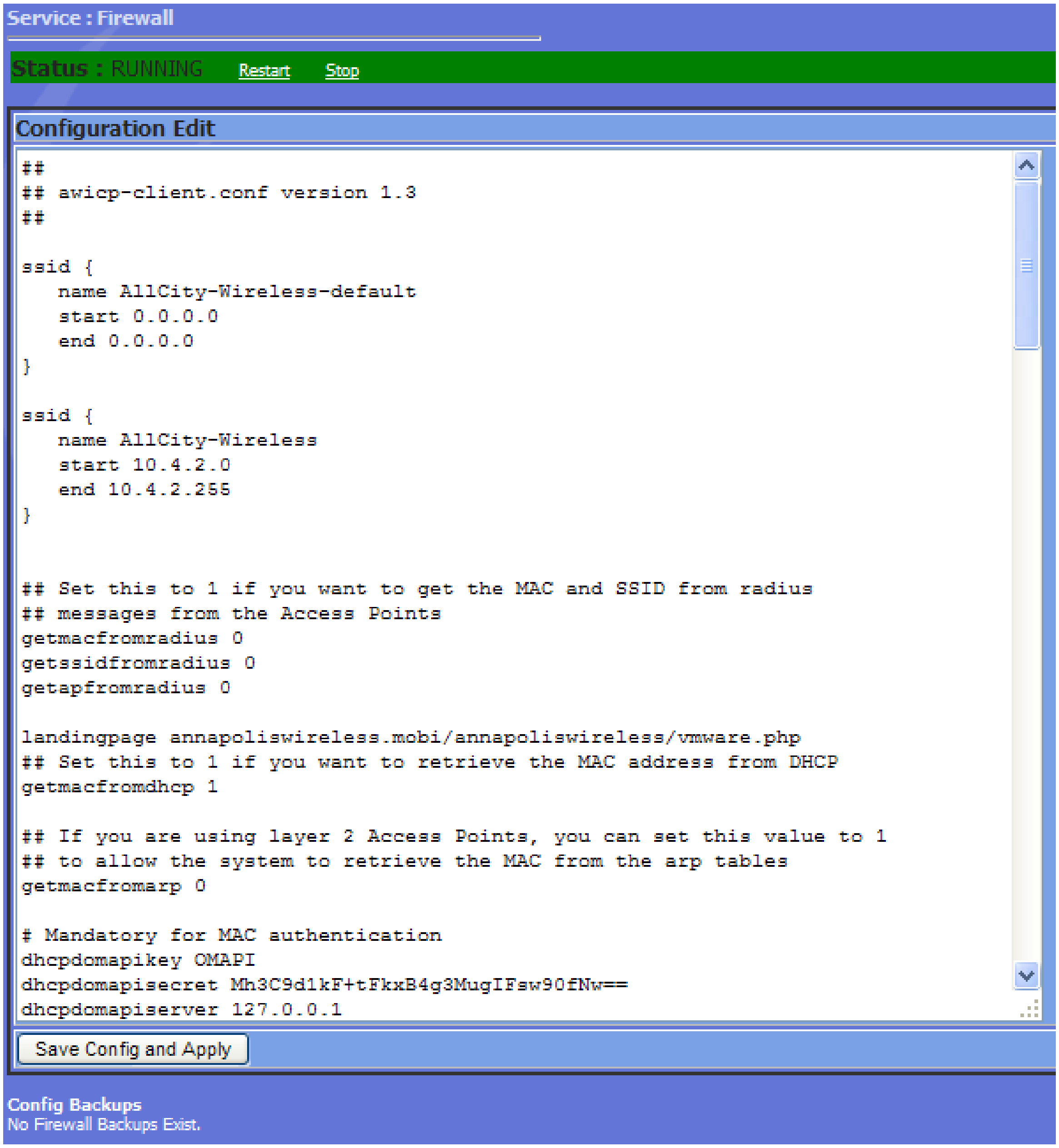
To update the certificates, simply cut and paste them into the **Key** and **Certificate** form fields and click **Update**. If there is an error with the new key and certificate, the old key and certificate will be automatically used instead. The new key and certificate installation should be verified in a web browser after updating.

1.7.4 Firewall

The firewall filters traffic that is passing between the LAN and WAN sides of the WiDirect. Firewalls can be programmed to block traffic based on a wide variety of criteria. Traditionally, firewalls enforce policies to maintain network security by using a set of rules that determine whether or not traffic is allowed to pass between the LAN and the WAN on a per-packet basis.

The Firewall configuration file also handles how certain user information is obtained from various services such as the user's MAC address, IP address, and Access Point. All of these settings are discussed in Tables 1-9 and 1-10.

The following section describes all the possible items for the Firewall configuration file. The first section describes all the Non-filtering firewall configuration items and the second section describes the traffic filtering configuration times. Firewall filtering rules dictate which traffic is allowed inbound and outbound of the WiDirect.



```
##
## awicp-client.conf version 1.3
##

ssid {
   name AllCity-Wireless-default
   start 0.0.0.0
   end 0.0.0.0
}

ssid {
   name AllCity-Wireless
   start 10.4.2.0
   end 10.4.2.255
}


## Set this to 1 if you want to get the MAC and SSID from radius
## messages from the Access Points
getmacfromradius 0
getssidfromradius 0
getapfromradius 0

landingpage annapoliswireless.mobi/annapoliswireless/vmware.php
## Set this to 1 if you want to retrieve the MAC address from DHCP
getmacfromdhcp 1

## If you are using layer 2 Access Points, you can set this value to 1
## to allow the system to retrieve the MAC from the arp tables
getmacfromarp 0

# Mandatory for MAC authentication
dhcpdomapikey OMAPI
dhcpdomapisecret Mh3C9d1kF+tFkxB4g3MugIFsw90fNw==
dhcpdomapiserver 127.0.0.1
```

Figure 1-42: Firewall Configuration Page

Hint: In the configuration file itself, there are commented lines which provide in-line configuration help. These lines begin with the pound (#) sign. Comments can be added to if needed by the Administrator.

1.7.4.1 Firewall Configuration Options

Table 1-9 lists many of the firewall configuration items, such as how to obtain the SSID, AP, IP, and MAC addresses of users, as well as turning on/off web caching, and adding trusted users. The traffic filtering features are covered in the next section.

Keyword	**Description**

ssid	Defines an SSID, along with the IP address range assigned to that SSID. This command saves processing time by eliminating the need to obtain the SSID from Radius accounting messages, and is also available when the access point model does not support Radius messages. The default ssid is set by setting the start and end ip range to 0.0.0.0. Example:
	ssid {
	    name AnnapolisWireless
	    start 0.0.0.0
	    end 0.0.0.0
	}

getapfromradius	Tells the WiDirect to obtain the user's Access Point information from the Radius Accounting messages.
getmacfromradius	Tells the WiDirect to obtain the user's MAC address from the Radius Accounting messages. This command should only be used if the standard DHCPD configuration is unavailable (See dhcpdommapi keywords below).
getssidfromradius	Tells the WiDirect to obtain the SSID from the Radius Accounting messages. Should only be used if multiple SSIDs are configured on the network.
getmacfromdhcp	Tells the WiDirect to obtain the user's MAC address directly from the DHCP server. In almost all configurations, this command is the preferred over **getmacfromradius** because of increased speed and reliability.
dhcpdomapikey **dhcpdomapisecret** **dhcpdommapiserver**	These keywords are for DHCP communication when using the getmacfromdhcpd command. If the standard configuration is used on the WiDirect for DHCP service, these commands should not change. However, if another DHCPD server is required, these commands will need to change to point to the other DHCPD server and the new server will need to be configured for OMAPI. See the dhcpd.conf file for more information.
TrustedIPList	This command allows the WiDirect to allow a set of *trusted* IP addresses from the internal side of the network to the Internet without Captive Portal challenge. The IP addresses should all appear on a single line, separated by commas. No blank space is allowed between entries. Example: **TrustedIPList 192.168.20.11,10.4.1.20,10.4.1.30**
preproxy	Preproxy must be enabled to use the walled garden or landing page feature. Set preproxy to 0 to disable these features.
landingpage	The landing page is the page the user is redirected to when they start using the network. If the landing page is not specified, then the user will be redirected to the login page. The landing page needs to contain a link to the login page for the user to be able to login. When updating the landing page, the PreProxy service also needs to be restarted from the PreProxy service page.
postproxy	Postproxy is used to handle web caching, acceleration, monitoring, and

	content filtering. It is recommended that postproxy be disabled if these features are not needed.
HostName **SSLAvailable**	If the WiDirect has a valid certificate installed, then the HostName should be set appropriately, and SSLAvailable should be set to yes. This enables the login page to be accessed securely. In a **WiDirect Client** the HostName option should be set to the hostname of the main WiDirect server.
GatewayInterface	The gateway interface is the interface that users are forced to authenticate on. By default only eth1 is listed as a gateway interface. To authenticate users on additional interfaces you can have multiple GatewayInterface lines.

Table 1-9: Firewall Configuration Items

WARNING: For all commands that are Radius accounting dependent, the access points need to be configured to use the WiDirect as their accounting and authentication server. The access points MUST have Radius Accounting enabled and pointing to the WiDirect as the primary and secondary Radius Server.

For example, if using Nortel Access Points and the WiDirect IP address is set to 10.4.1.1 (default), the ap.ftp file must contain the following lines:

```
[RADIUS]
PrimaryAuthenticationServer=10.4.1.1:1812
PrimaryAccountingServer=10.4.1.1:1813
```

1.7.4.2 Traffic Filtering Firewall Configuration Items

The firewall rules are broken into two **RuleSets**; **Global** & K**nown-users**. While there are other defined RuleSets in the firewall configuration file, editing is NOT supported at this time. AllCity Wireless only supports the Global and Known-users Rulesets at this time.

Firewall Syntax

Essentially, there is allow and block rules. These rules are processed in FIFO order, which means the first match wins. Here is an example of firewall rules.

```
firewall allow tcp port 80 to 10.10.1.1
firewall allow udp to 172.32.1.0/24
firewall block to 172.16.0.0/12
```

Syntax of the Firewall command is as follows:

FirewallRule *action* [tcp | udp] [port XYZ] [to IP][/subnet]

Table 1-10 describes each portion of this command in detail.

FirewallRule	Tells the WiDirect that the rule is a firewall rule, mandatory
action	Describes the behavior of the line, can be either *allow* or *block*.
tcp | udp	Optional. Describes what type of traffic to filter
port XYZ	Optional. Describes a specific port to block or allow. Ports value XYZ can be a number from 1 to 65536.

to IP	Optional. Defines a specific IP or IP range to apply the rule
/subnet	Optional. Can only be used with the IP command, which defines a subnet rather than a specific IP to apply the list to.

Table 1-10 : FirewallRule Options

Global

The Global firewall section defines all the rules that apply to every single state of the user's connection. A user's state could be '**unknown**', '**known**', and '**disabled**'. Any global firewall rules that are defined will apply to all these states. In other words, if a rule is defined in the Global section that allows the users to a certain IP address, all users are allowed to access that IP address even if they have not logged into the WiDirect's captive portal.

A good example is allowing users to access advertisement driven sites without logging into the system, which provides a different sort of walled garden definition. In some cases, some Ad insertion sites only need access to certain IP address instead of an entire domain. If requirements state that certain Ads are displayed on the user's login page, this section might be the only way to provide access to the image and links on the login page.

Another instance when users need to be allowed to certain IP addresses if for PayPal support. Users must be able to login to their PayPal account to pay for their access plan, so port 443 to the IP addresses of the PayPal web site must be allowed in the firewall. Due to the nature of the secure http protocol, walled garden sites can only use regular non-secure http.

Known-users

The Known-users firewall section defines firewall rules for users that have successfully authenticated to the WiDirect. Although it might seem counter intuitive, this section allows an Administrator to DENY traffic to specific destinations. By default, the WiDirect allows authenticated users to have complete unrestricted access to the Internet with the following RuleSet:

```
FirewallRuleSet known-users {
   FirewallRule allow to 0.0.0.0/0
}
```

For example, if requirements state that users are not allowed to access SMTP to any mail server except the local SMTP relay with an IP address of 10.1.1.10, the configuration might look like this:

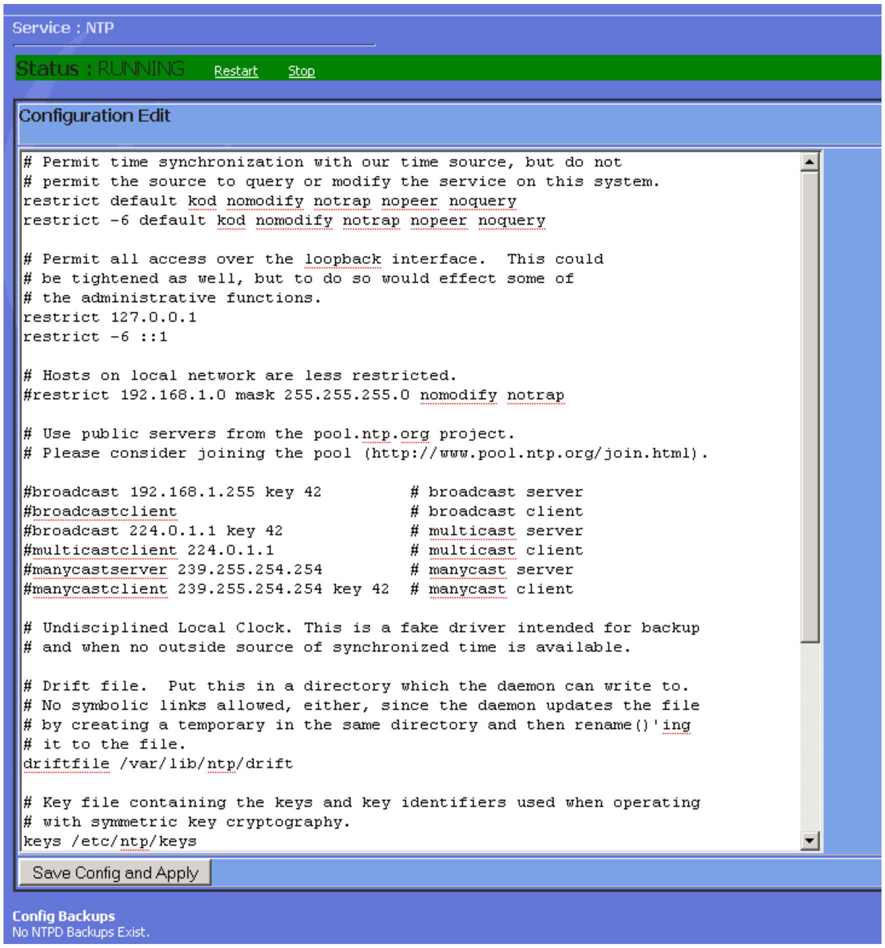
```
FirewallRuleSet known-users {
        # Allow SMTP to our SMTP relay
        FirewallRule allow tcp port 25 to 10.1.1.100
        # Deny all other SMTP traffic
        FirewallRule block tcp port 25
        #
        # Now just let every out everywhere (required rule)
        FirewallRule allow to 0.0.0.0/0
  }
```

1.7.5 NTP

The WiDirect appliance internal clock must remain accurate for a number of the critical systems to function. In order to make this work properly, an NTP server is polled to synchronize the internal clock with a known NTP clock. NTP also provides time services to local devices.

To edit the NTP configuration, go to the ***NTP*** page under the ***Services*** menu. This is the standard NTP configuration and it will allow you to change NTPD servers as needed. If more information is required for configuring NTP, please see the NTP web site: http:://www.ntp.org.

NOTE: This is NOT where you change the local date and time, this is only for Network Time Protocol (NTP). To configure the Date & Time on the WiDirect, see the **Date and Time Configuration** section in this document.



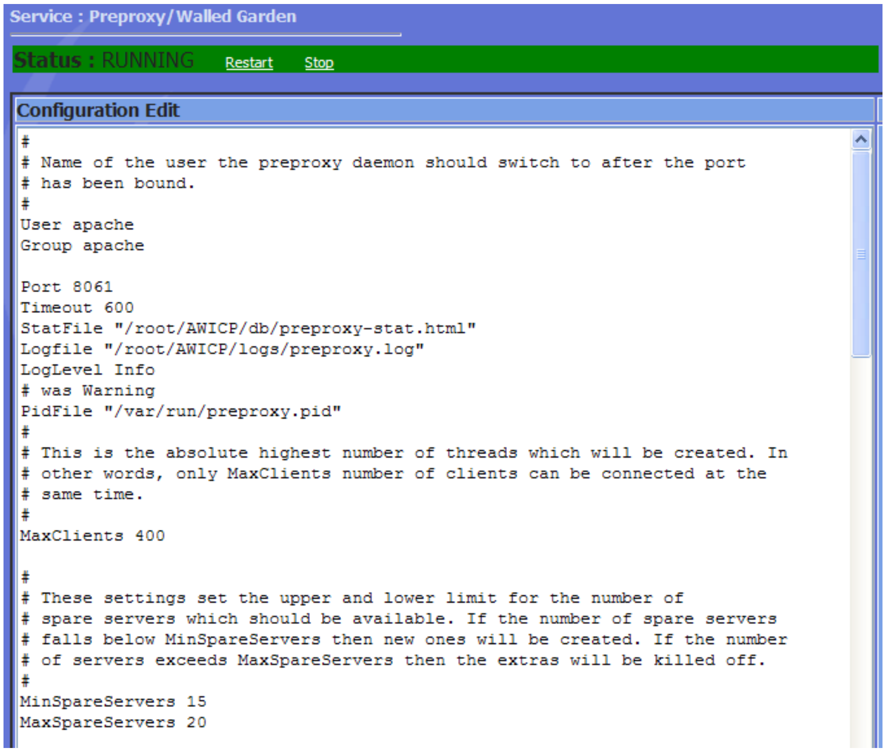
```
# Permit time synchronization with our time source, but do not
# permit the source to query or modify the service on this system.
restrict default kod nomodify notrap nopeer noquery
restrict -6 default kod nomodify notrap nopeer noquery

# Permit all access over the loopback interface.  This could
# be tightened as well, but to do so would effect some of
# the administrative functions.
restrict 127.0.0.1
restrict -6 ::1

# Hosts on local network are less restricted.
#restrict 192.168.1.0 mask 255.255.255.0 nomodify notrap

# Use public servers from the pool.ntp.org project.
# Please consider joining the pool (http://www.pool.ntp.org/join.html).

#broadcast 192.168.1.255 key 42          # broadcast server
#broadcastclient                         # broadcast client
#broadcast 224.0.1.1 key 42              # multicast server
#multicastclient 224.0.1.1               # multicast client
#manycastserver 239.255.254.254          # manycast server
#manycastclient 239.255.254.254 key 42   # manycast client

# Undisciplined Local Clock. This is a fake driver intended for backup
# and when no outside source of synchronized time is available.

# Drift file.  Put this in a directory which the daemon can write to.
# No symbolic links allowed, either, since the daemon updates the file
# by creating a temporary in the same directory and then rename()'ing
# it to the file.
driftfile /var/lib/ntp/drift

# Key file containing the keys and key identifiers used when operating
# with symmetric key cryptography.
keys /etc/ntp/keys
```

No NTPD Backups Exist.

Figure 1-43: NTPD Configuration

1.7.6 Preproxy

When enabled in the firewall configuration file, the Preproxy service is responsible for redirecting users to either the login page or the landing page. It also allows users to visit sites on the walled garden without logging in. The configuration file may be edited to change the number of processes that are running at any given time. Typically the default settings are fine, but in a large network, or if a lot of content is being displayed to users that are not signed on, then it is a good idea to increase the number of Preproxy processes.



```
#
# Name of the user the preproxy daemon should switch to after the port
# has been bound.
#
User apache
Group apache

Port 8061
Timeout 600
StatFile "/root/AWICP/db/preproxy-stat.html"
Logfile "/root/AWICP/logs/preproxy.log"
LogLevel Info
# was Warning
PidFile "/var/run/preproxy.pid"
#
# This is the absolute highest number of threads which will be created. In
# other words, only MaxClients number of clients can be connected at the
# same time.
#
MaxClients 400

#
# These settings set the upper and lower limit for the number of
# spare servers which should be available. If the number of spare servers
# falls below MinSpareServers then new ones will be created. If the number
# of servers exceeds MaxSpareServers then the extras will be killed off.
#
MinSpareServers 15
MaxSpareServers 20
```

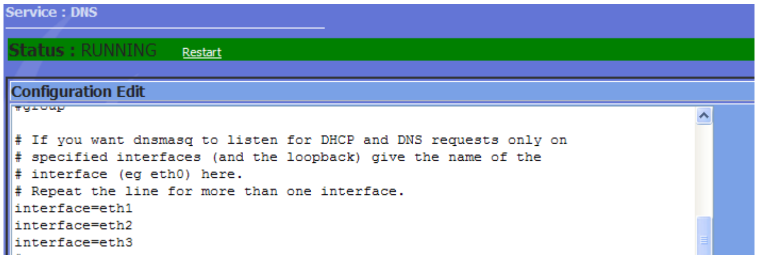
Figure 1-44: Preproxy Configuration

1.7.7 Web Cache

When enabled in the firewall configuration file, the web caching service is responsible for accelerating user’s web sites, tracking sites visited, content filtering, and advertisement delivery.

1.7.8 DNS

The DNS configuration page allows you to configure the DNS server. The default DNS configuration only listens for DNS requests on eth1, eth2, and eth3. If VLANs have been added then the file needs to be updated to respond to DNS requests on those interfaces.



```
#group

# If you want dnsmasq to listen for DHCP and DNS requests only on
# specified interfaces (and the loopback) give the name of the
# interface (eg eth0) here.
# Repeat the line for more than one interface.
interface=eth1
interface=eth2
interface=eth3
```

Figure 1-45: DNS Configuration

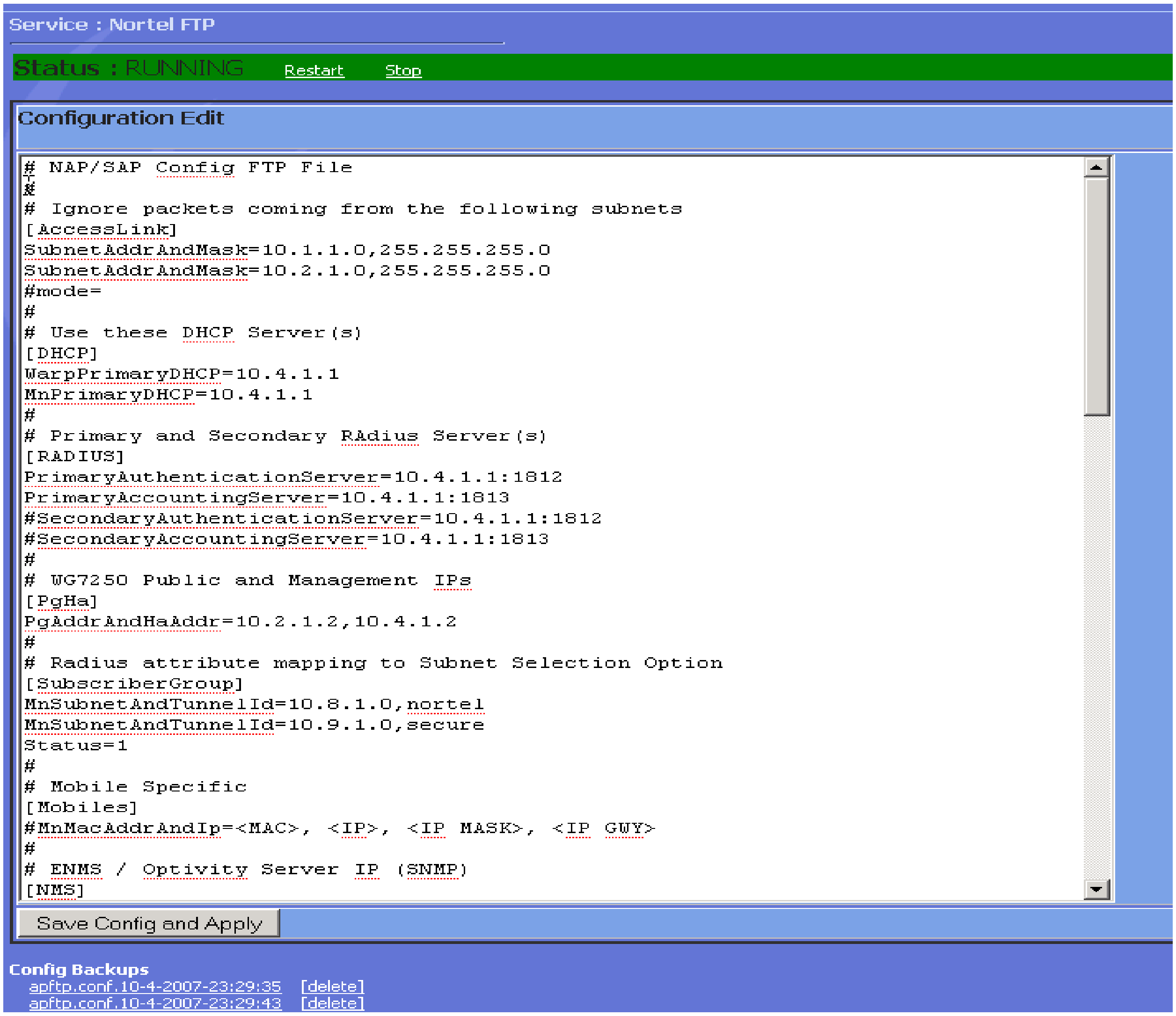
Figure 1-45 shows the part of the DNS file that needs to be edited to add additional interfaces. Each interface is listed on its own line. VLAN interfaces would be a combination of the VLAN tag number and the interface name. VLAN 600 on eth1 would be listed as eth1.600.

1.8 Access Point Support

1.8.1 *Nortel*

1.8.1.1 FTP

The FTP files can be edited under ***Services*** menu after clicking on ***NORTEL Support*** then choosing ***FTP***. The file defines attributes of access points and is pulled from the server every time an access point attempts to join the mesh.



```
# NAP/SAP Config FTP File
#
# Ignore packets coming from the following subnets
[AccessLink]
SubnetAddrAndMask=10.1.1.0,255.255.255.0
SubnetAddrAndMask=10.2.1.0,255.255.255.0
#mode=
#
# Use these DHCP Server(s)
[DHCP]
WarpPrimaryDHCP=10.4.1.1
MnPrimaryDHCP=10.4.1.1
#
# Primary and Secondary RAdius Server(s)
[RADIUS]
PrimaryAuthenticationServer=10.4.1.1:1812
PrimaryAccountingServer=10.4.1.1:1813
#SecondaryAuthenticationServer=10.4.1.1:1812
#SecondaryAccountingServer=10.4.1.1:1813
#
# WG7250 Public and Management IPs
[PgHa]
PgAddrAndHaAddr=10.2.1.2,10.4.1.2
#
# Radius attribute mapping to Subnet Selection Option
[SubscriberGroup]
MnSubnetAndTunnelId=10.8.1.0,nortel
MnSubnetAndTunnelId=10.9.1.0,secure
Status=1
#
# Mobile Specific
[Mobiles]
#MnMacAddrAndIp=<MAC>, <IP>, <IP MASK>, <IP GWY>
#
# ENMS / Optivity Server IP (SNMP)
[NMS]
```

Save Config and Apply
Config Backups
apftp.conf.10-4-2007-23:29:35 [delete]
apftp.conf.10-4-2007-23:29:43 [delete]

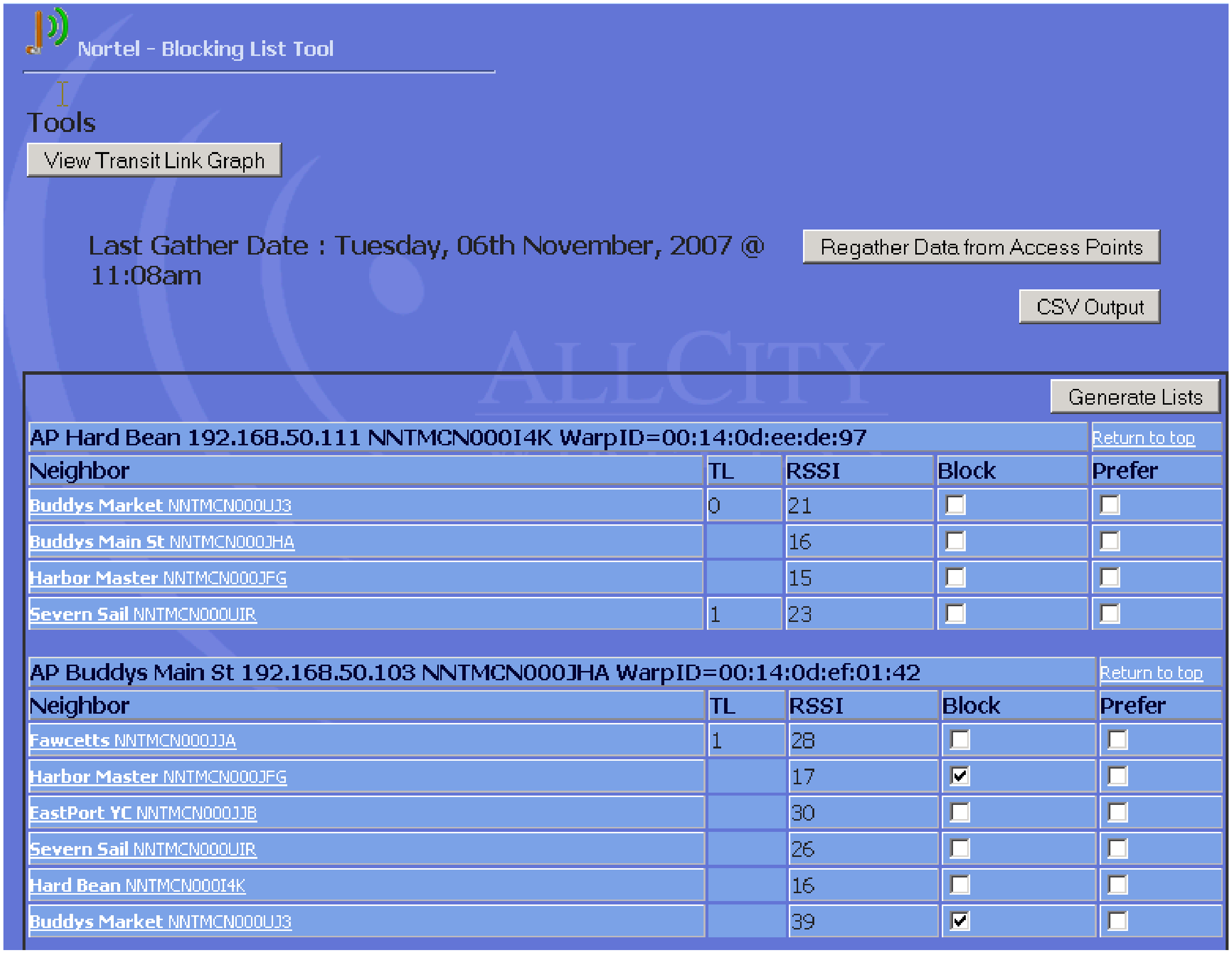
Figure 1-46: FTP Configuration

This file is strictly for Nortel Equipment The file is called ap.ftp and is stored in the NortelWarp user's home directory on the WiDirect. For more information on the syntax of this file, consult the Nortel Access Point documentation at http://www.nortel.com.

1.8.1.2 AP List Tool

The AP list tool is a special piece of software that helps control and modify how a Nortel mesh configures itself with blocking lists and preferred lists. This tool takes the complicated task of blocking list creation and makes it more manageable by allowing the Administrator to just click check boxes to generate the proper lists. The WiDirect queries each and every AP to find the existing neighbor lists and shows them in table format.

Clicking on the **View Transit Link Graph** button a graphic is displayed of the current network and its TL connections. Clicking the **View Blocked Graph** button shows a graphic representation of the possible TL paths and which ones are administratively blocked.



Nortel - Blocking List Tool

Tools

Last Gather Date : Tuesday, 06th November, 2007 @ 11:08am

AP Hard Bean 192.168.50.111 NNTMCN000I4K WarpID=00:14:0d:ee:de:97 — Return to top

Neighbor	TL	RSSI	Block	Prefer
Buddys Market NNTMCN000UJ3	0	21	□	□
Buddys Main St NNTMCN000JHA		16	□	□
Harbor Master NNTMCN000JFG		15	□	□
Severn Sail NNTMCN000UIR	1	23	□	□

AP Buddys Main St 192.168.50.103 NNTMCN000JHA WarpID=00:14:0d:ef:01:42 — Return to top

Neighbor	TL	RSSI	Block	Prefer
Fawcetts NNTMCN000JJA	1	28	□	□
Harbor Master NNTMCN000JFG		17	☑	□
EastPort YC NNTMCN000JJB		30	□	□
Severn Sail NNTMCN000UIR		26	□	□
Hard Bean NNTMCN000I4K		16	□	□
Buddys Market NNTMCN000UJ3		39	☑	□

Figure 1-47: AP List Tool

Before making changes to the network TL properties, click the **Regather Data from Access Points** button, which tells the WiDirect to recollect all the latest TL data from all the Access Points in the network. This is a network intensive task so only run this command when ready to make TL changes on the network. This step also allows the WiDirect to gather the latest signal strengths for all the neighbor connections.

Once the gather completes, the WiDirect provides a current list of Access Points and their neighbors, which allows the Administrator to choose which neighbors to block and prefer by clicking on the checkboxes on the page.

Once all the selections are made, generate an output file by clicking the **Generate Lists** button. The output of that list can now be cut and pasted into the AP.FTP file in the FTP tab above the **AP List Tool** Tab. By adding it to the ap.ftp file, the access points will learn about the new blocking and preferred lists the next time they are restarted.

WARNING: Adding blocking lists requires a bit of thought and planning. If the blocking lists are too intensive, the risk is higher of orphaning an access point on the mesh. For more information about blocking lists and how they affect the Nortel mesh, consult the Nortel documentation at http://www.nortel.com

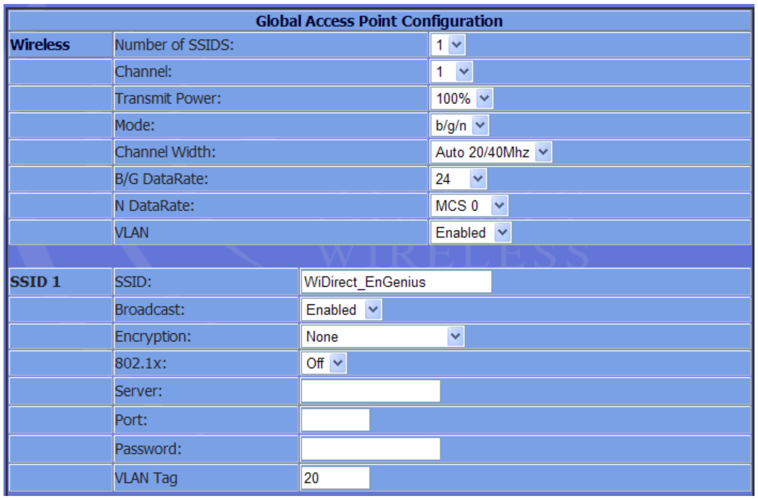
There is also a “CSV Output” button, which generates a Comma Separated Values (CSV) of the blocking lists. This can be useful for administrators to pull the current blocking lists into an Excel spreadsheet for a more detailed analysis.

1.8.2 EnGenius

1.8.2.1 Access Point Configuration

The access point configuration page allows you to configure various settings on the ECB3500 and ECB9500 access points. For the WiDirect to control these access points they need to be added to the access point database with the correct MAC address and serial numbers. The type should be set to “EnGenius ECB3500 (Auto Configure)” or “EnGenius ECB9500 (Auto Configure).”

The EnGenius Configuration page is used to configure the access points. Various settings can be set, such as channel, transmit power, data rate, SSID, WEP, WPA, and VLAN tagging. The access points will be polled at regular intervals, and if any settings need to be updated then they will be changed. If a new access point is plugged in with a default configuration, then both its IP and other settings will be updated. When an access point is reconfigured a message will be in the Event Viewer.



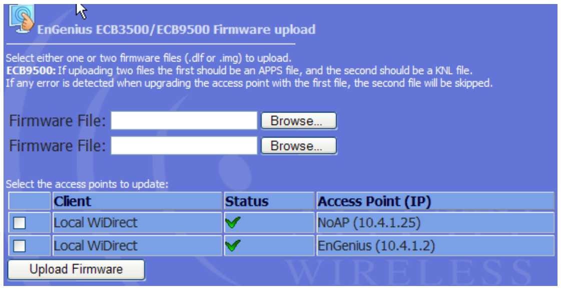
Global Access Point Configuration		
Wireless	Number of SSIDS:	1
	Channel:	1
	Transmit Power:	100%
	Mode:	b/g/n
	Channel Width:	Auto 20/40Mhz
	B/G DataRate:	24
	N DataRate:	MCS 0
	VLAN	Enabled
SSID 1	SSID:	WiDirect_EnGenius
	Broadcast:	Enabled
	Encryption:	None
	802.1x:	Off
	Server:	
	Port:	
	Password:	
	VLAN Tag	20

Figure 1-48: EnGenius Configuration

The EnGenius configuration page is pictured above in Figure 1-45. Most settings are global and will be set the same for each access point. At the bottom of the configuration page some settings can be set for individual access points.

1.8.2.2 Firmware Upgrades

The firmware upgrade page allows you to upgrade the firmware on the access points. Simply choose the firmware files to upload and the access points to update. When the firmware is updated a message will be displayed on the Event Viewer.



EnGenius ECB3500/ECB9500 Firmware upload

Select either one or two firmware files (.dlf or .img) to upload.
ECB9500: If uploading two files the first should be an APPS file, and the second should be a KNL file.
If any error is detected when upgrading the access point with the first file, the second file will be skipped.

Firmware File:
Firmware File:

Select the access points to update:

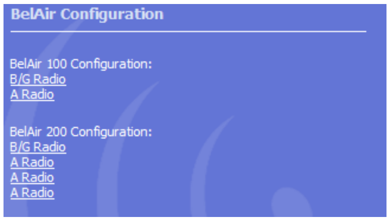
	Client	Status	Access Point (IP)
□	Local WiDirect	✓	NoAP (10.4.1.25)
□	Local WiDirect	✓	EnGenius (10.4.1.2)

Figure 1-49: EnGenius Firmware Upload

1.8.3 BelAir

1.8.3.1 Access Point Configuration

The access point configuration page allows you to configure various settings on the BA100 and BA200 access points. For the WiDirect to control these access points they need to be added to the access point database with the correct Ethernet MAC address and serial numbers. The type should be set to “BelAir 100 Auto Configure” or “BelAir 200 Auto Configure.” The BelAir Configuration link will bring you to a page where you can decide which radios to configure. There are different configuration pages for the BA100 and BA200 access points, as well as different configuration pages for each of the individual radios.



BelAir Configuration

BelAir 100 Configuration:
B/G Radio
A Radio

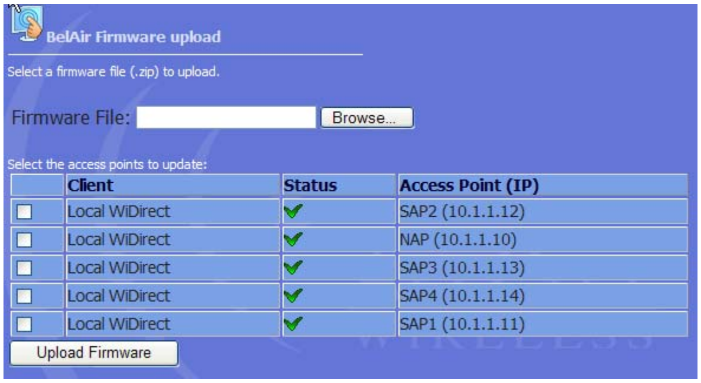
BelAir 200 Configuration:
B/G Radio
A Radio
A Radio
A Radio

Figure 1-50 AP and Radio

After selecting the access point model and radio to configure, an additional page will be displayed allowing you to set configuration items for that radio. Both access and backhaul configuration changes can be made. After the changes are made a confirmation message, along with any error messages, will be placed in the Event Viewer.

1.8.3.2 Firmware Upgrades

The **BelAir Firmware** page can be used to perform firmware upgrades on BA100 and BA200 model access points. Simply choose a zip file that includes the firmware image, and select the access points to update. A notification will be placed in the Event Viewer when the update is complete.



BelAir Firmware upload

Select a firmware file (.zip) to upload.

Firmware File: Browse...

Select the access points to update:

	Client	Status	Access Point (IP)
□	Local WiDirect	✓	SAP2 (10.1.1.12)
□	Local WiDirect	✓	NAP (10.1.1.10)
□	Local WiDirect	✓	SAP3 (10.1.1.13)
□	Local WiDirect	✓	SAP4 (10.1.1.14)
□	Local WiDirect	✓	SAP1 (10.1.1.11)

Upload Firmware

Figure 1-51: BelAir Firmware Upgrade

1.9 Tools

The **Tools** section provides the WiDirect administrator with the basic network troubleshooting tools of ping, trace route, and dns query.

1.9.1 Ping

Ping allows an administrator to test network connectivity by sending a ping request to another machine on the network. Enter in the target IP address of the remote machine to test and click the **Ping** button. The results of the ping will be displayed.

This example is a successful ping of IP 192.168.20.248:

```
PING 192.168.20.248 (192.168.20.248) 56(84) bytes of data.
64 bytes from 192.168.20.248: icmp_seq=1 ttl=64 time=0.310 ms
64 bytes from 192.168.20.248: icmp_seq=2 ttl=64 time=0.264 ms
64 bytes from 192.168.20.248: icmp_seq=3 ttl=64 time=0.214 ms
--- 192.168.20.248 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2000ms
rtt min/avg/max/mdev = 0.214/0.262/0.310/0.043 ms
```

1.9.2 Traceroute

Like the **Ping** command, the **Traceroute** command tests network connectivity by attempting to find the network path between the WiDirect and another network device. Type in the target address and click the **Traceroute** button. The results of the **Traceroute** will be displayed after the WiDirect executes the command.

Example output:

```
traceroute to 10.3.1.50 (10.3.1.50), 30 hops max, 40 byte packets
 1  balance (192.168.200.1)  1.875 ms  2.286 ms  2.747 ms
 2  73.135.120.1 (73.135.120.1)  81.174 ms  93.181 ms  93.600 ms
 3  ge-1-20-ur01.annapolis.md.bad.comcast.net (68.87.136.205)  94.065 ms  94.535 ms  94.514 ms
 4  te-9-3-ur02.gambrills.md.bad.comcast.net (68.87.128.150)  94.983 ms  94.957 ms  96.891 ms
 5  te-9-1-ur01.gambrills.md.bad.comcast.net (68.87.129.17)  94.858 ms  97.319 ms  97.295 ms
 6  te-7-1-ar01.capitolhghts.md.bad.comcast.net (68.87.129.22)  97.265 ms  79.813 ms  80.194 ms
 7  12.86.111.5 (12.86.111.5)  81.152 ms  117.899 ms  141.375 ms
 8  tbr2.wswdc.ip.att.net (12.122.113.78)  162.803 ms  163.262 ms  163.726 ms
 9  cr1.wswdc.ip.att.net (12.122.16.89)  164.194 ms  164.173 ms  164.619 ms
10  cr2.phlpa.ip.att.net (12.122.4.53)  165.089 ms  165.062 ms  165.504 ms
11  tbr2.phlpa.ip.att.net (12.122.20.86)  167.469 ms  167.444 ms  167.894 ms
12  tbr2.cgcil.ip.att.net (12.122.10.93)  166.859 ms  171.816 ms  172.279 ms
13  12.122.99.93 (12.122.99.93)  113.359 ms  105.891 ms  183.838 ms
14  12-215-4-17.client.mchsi.com (12.215.4.17)  321.209 ms  321.622 ms  321.111 ms
15  12-215-8-163.client.mchsi.com (12.215.8.163)  328.543 ms * *
16  10.3.1.50 (10.3.1.50)  338.253 ms  267.762 ms *
```

1.9.3 DNS Query

The ***DNS Query*** command allows an administrator to test DNS connectivity. DNS is very important because the captive portal uses it to detect a user's initial Internet request. DNS is also used in some services such as FTP.

For Domain resolution check, go to the ***Tools*** menu and then ***DNS Query***. Type in a domain to query, such as www.google.com and click the ***Lookup*** button. The results will be displayed once the lookup completes.

```
DNS look up of www.google.com
Server:         192.168.200.1
Address:        192.168.200.1#53
```

```
Non-authoritative answer:
www.google.com  canonical name = www.l.google.com.
Name:   www.l.google.com
Address: 64.233.161.99
Name:   www.l.google.com
Address: 64.233.161.104
Name:   www.l.google.com
Address: 64.233.161.103
Name:   www.l.google.com
Address: 64.233.161.147
```

2 Command Line Interface

2.1 Secure Shell access

An SSH client is required in order to access the command line interface of the WiDirect. AllCity Wireless recommends using *putty*, which is a free download at this website:

http://www.chiark.greenend.org.uk/~sgtatham/putty/

By opening putty or another SSH client, connect to the IP address of the WiDirect machine. By default, this IP address is 10.4.1.1 on the ETH1 interface. However, if the IP address of any of the WiDirect's interfaces has changed, the new IP address should be the one that used in the SSH connection. If you are accessing from the Internet, you'll want to use the public IP address of the WiDirect.

Once connected, the system will ask for a login and password. For security reasons, the root username can not be used. Administrators must use the **portal** login to gain access. If this is a new system, the password will be **widirect**.

Once connected, Administrators are free to use any of the standard Unix commands to navigate the system. However, to use any 'root' level access, we strongly suggest using the **sudo** command instead of switching to the root user. See the **sudo** section below for more information.

To exit the command line interface, use the **logout** command or **CONTROL-D**.

NOTE: If editing files, consult the VI quick reference guide located in this document.

2.2 Using “sudo” commands

For security reasons, the WiDirect to allows the **portal** user to run the **sudo** process without switching to the root user, which allows root level access to various parts of the system. Only top-level Administrators should have the root password.

To use sudo, append the word **sudo** in front of any command. For example, to edit the iptables file, which is owned by root, use the following command.

```
sudo vi /etc/sysconfig/iptables
```

Sudo prompts for the **portal** password, not root password. This is done to verify that it's still the person that originally' connected to the SSH process.

Sudo works for any commands that require root access.

2.3 Changing the password

It is a good idea to change the password of the portal user. When logged in as the portal user, use the passwd command and select a new secure password.

There is also an account that is used by the support staff to perform maintenance and monitor for problems. This password should be set by the support staff to something secure. To change the password on this account, execute the following command:

```
sudo passwd awisupport
```

2.4 Helpful command line commands

When changing the IP address of ETH1 a full system restart can be avoided by simply restarting the WiDirect processes by using the following commands:

```
sudo /root/AWICP/bin/widirect_stop_all.sh
sudo /root/AWICP/bin/widirect_start_all.sh
```

The process of stopping and starting will take about 45 seconds.

Restarting the access point monitoring processes can be done to get up to date data on the access points:

```
sudo /sbin/service awicp_ap_ping_monitor restart
sudo /sbin/service awicp_ap_snmp_monitor restart
```

If the WiDirect gets its IP address using DHCP, the following command may be used to get a new IP address:

```
sudo /sbin/service network restart
```

3 Installation

3.1 Support Services

Support Contact Details
Dedicated Phone Support: +1-443-951-1392
Dedicated e-mail support: support@allcitywireless.com
Self-support: www.allcitywireless.com/support

3.2 Example Network Diagram

The following section describes a possible network deployment scenario Figure 3-1 shows the network layout with a WiDirect server and a client. Each of the clients will have several access points, and will have multiple subnets for users. This example will assume one subnet is for public WiFi users and the other subnet for business customers. The network for business customers will be on a VLAN and have different speed restrictions. There will be an additional subnet used for administering the access points.
The following IP addressing scheme will be used on both WiDirects:

Internet IP	192.168.200.2/24
DNS	192.168.200.1
Default Route	192.168.200.1

Table 3-1: Internet Connection Information

Public WiFi Users	10.4.1.0/24
Business Users	10.5.1.0/24

Table 3-2 Subnets Used

WiDirect ETH1	10.4.1.1
WiDirect ETH1, VLAN 200	10.5.1.1
WiDirect ETH1, subinterface	10.1.1.254
NAP	10.1.1.10
SAP1	10.1.1.11
SAP2	10.1.1.12
SAP3	10.1.1.13
SAP4	10.1.1.14

Table 3-3 Specific IP addresses

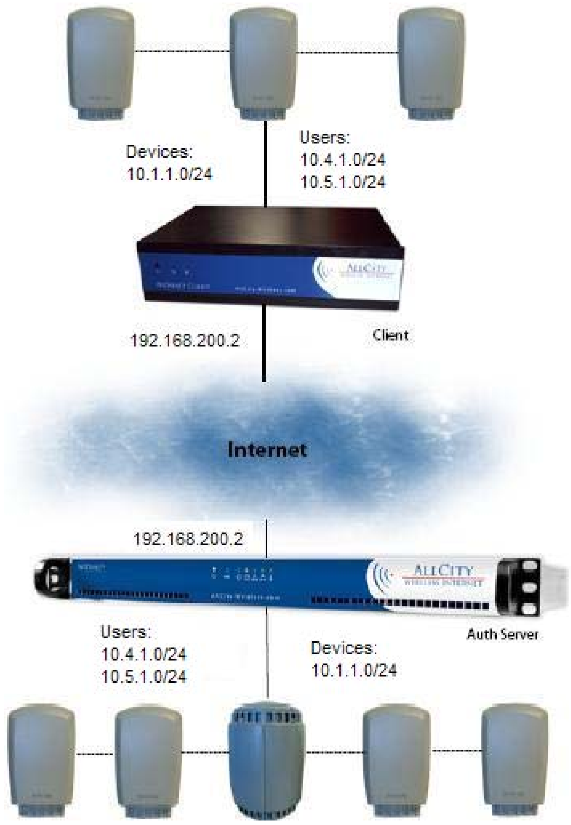


Figure 3-1: Sample Network Diagram

3.2.1 Basic Setup and Configuration

For the most part, the network diagram that is pictured in Figure 3-1 shows a basic WiDirect setup with a client and access points. This addressing scheme is only a suggestion and any IP addressing scheme is valid with the WiDirect.

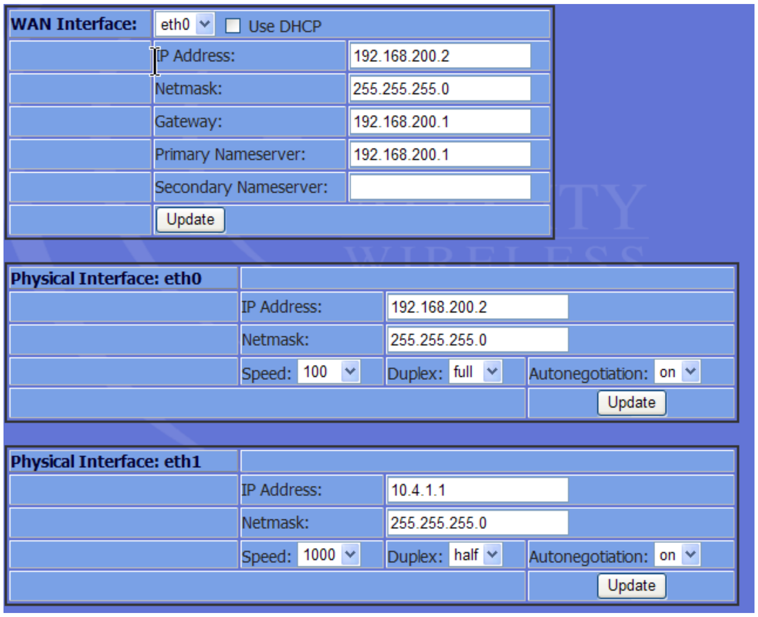
Before configuring, the first step is to login to the admin page of the WiDirect. See Section 1 on how to access the administration logging page. (By default it is http://10.4.1.1/portal/admin, but can change if the IP addresses have been modified.)

3.2.1.1 WiDirect Network Configurations

The first step in configuring the same network is to configure the Internet information on the WiDirect. It is recommended that the IP address of ETH0 be changed from using DHCP to a static IP address.

NOTE: If you change the IP address of the interface that you are connected to, the connection will drop. You'll need to reconfigure the local IP address of the connecting machine in order to reconnect to the WiDirect. When changing the IP address of the ETH1 interface, the WiDirect should be restarted.

In this example, the ETH1 interface is going to remain the same as the default, which is 10.4.1.1/24. However, the ETH0 is going to change to a static IP address with a default gateway as shown in Table 3-1. Figure 3-2 shows the new settings:



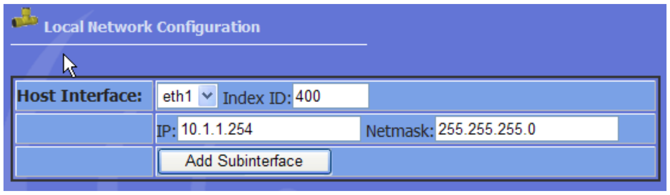
WAN Interface: eth0 □ Use DHCP
IP Address: 192.168.200.2
Netmask: 255.255.255.0
Gateway: 192.168.200.1
Primary Nameserver: 192.168.200.1
Secondary Nameserver:
Update

Physical Interface: eth0
IP Address: 192.168.200.2
Netmask: 255.255.255.0
Speed: 100 Duplex: full Autonegotiation: on
Update

Physical Interface: eth1
IP Address: 10.4.1.1
Netmask: 255.255.255.0
Speed: 1000 Duplex: half Autonegotiation: on
Update

Figure 3-2: Setting up the Network

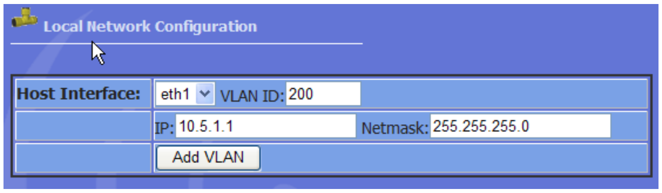
This example uses a subinterface to communicate with the access points on the 10.1.1.0/24 subnet. Click the Add Subinterface button to add the additional IP address on ETH1. The Index ID of 400 is used in the example, but other numbers, such as 1 or 2, would be valid as well.



Local Network Configuration
Host Interface: eth1 Index ID: 400
IP: 10.1.1.254 Netmask: 255.255.255.0
Add Subinterface

Figure 3-3: Adding Subinterface

This example network will also be using a VLAN. Click the Add VLAN button and set the appropriate IP address and subnet mask for VLAN 200.

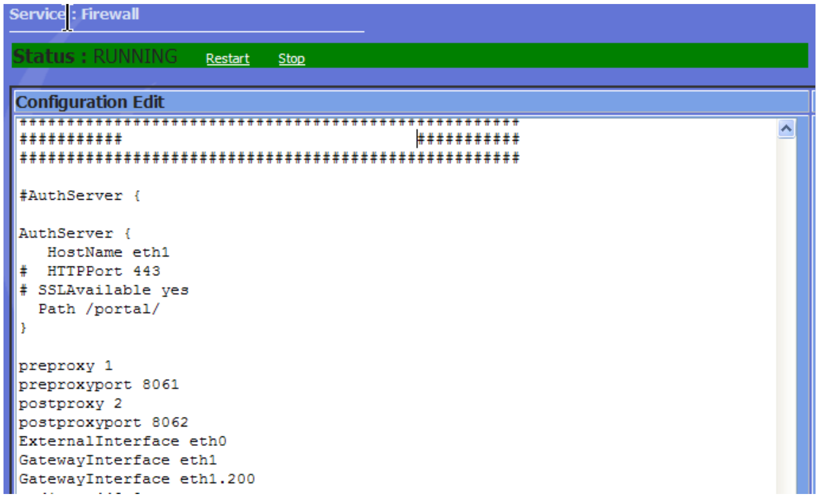


Local Network Configuration
Host Interface: eth1 VLAN ID: 200
IP: 10.5.1.1 Netmask: 255.255.255.0
Add VLAN

Figure 3-4: Configuring VLAN Interface

3.2.1.2 Configure Firewall

The firewall will have to be modified to listen on the VLAN interface. If the firewall is not configured to listen on the VLAN interface, then that traffic will be allowed to the internet without authentication. Open the **Firewall** page to add the VLAN interface as a gateway interface by adding the line “GatewayInterface eth1.200” in the location described in Figure 3-5.

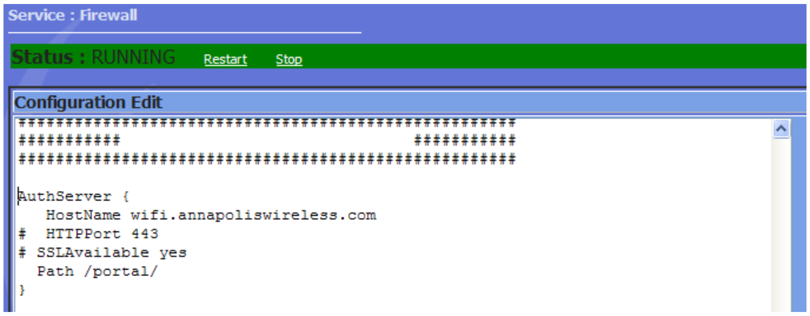


```
#######################################################
###########                                  ###########
#######################################################

#AuthServer {

AuthServer {
   HostName eth1
#  HTTPPort 443
# SSLAvailable yes
  Path /portal/
}

preproxy 1
preproxyport 8061
postproxy 2
postproxyport 8062
ExternalInterface eth0
GatewayInterface eth1
GatewayInterface eth1.200
```

Figure 3-5: Add Gateway Interface

3.2.1.3 Configuring WiDirect Client

The WiDirect Client must be configured with the location of the WiDirect Authorization Server. This setting can be left alone on the WiDirect Authorization Server. This setting can be accessed on the **Firewall** page. Find the part of the file where the hostname of the main WiDirect server is defined. By default it will be “eth1” and it should be changed to the hostname of IP address of the main WiDirect server.

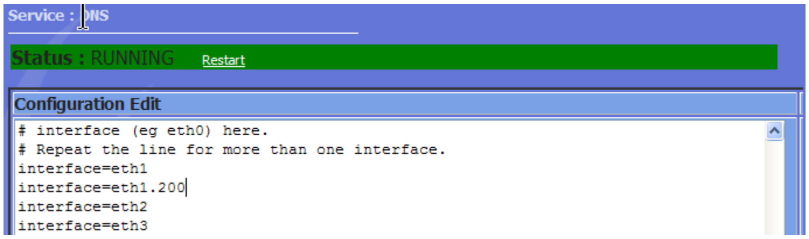


```
#######################################################
###########                                  ###########
#######################################################

AuthServer {
   HostName wifi.annapoliswireless.com
#  HTTPPort 443
# SSLAvailable yes
  Path /portal/
}
```

Figure 3-6: Configure Client with Auth Server Information

3.2.1.4 Configure DNS

Since this example uses a VLAN interface, the WiDirect must be configured to listen to DNS requests on this interface. The DNS server configuration file can be accessed on the **Services->DNS** page. Find the section of the file shown below, and add the line “interface=eth1.200” for the WiDirect to process DNS requests on the VLAN interface.

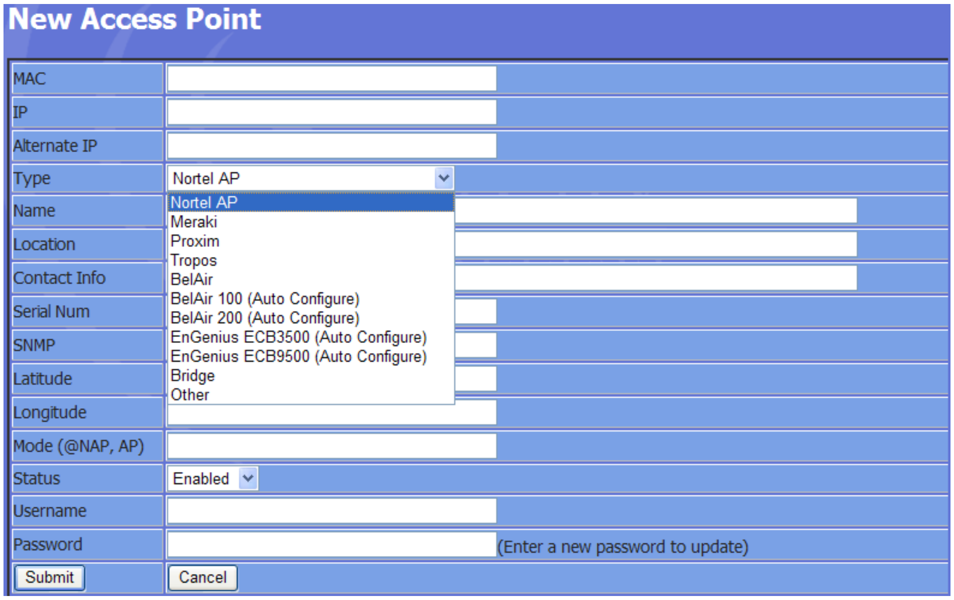


```
# interface (eg eth0) here.
# Repeat the line for more than one interface.
interface=eth1
interface=eth1.200
interface=eth2
interface=eth3
```

Figure 3-7: Configure DNS Server

3.2.1.5 Adding Access Points

In this example, there are eight access points total. Figure 3-8 shows the page for adding access points. The access points connected to the WiDirect Client should be added on that server. The five access points connected to the main WiDirect should be added on that server.



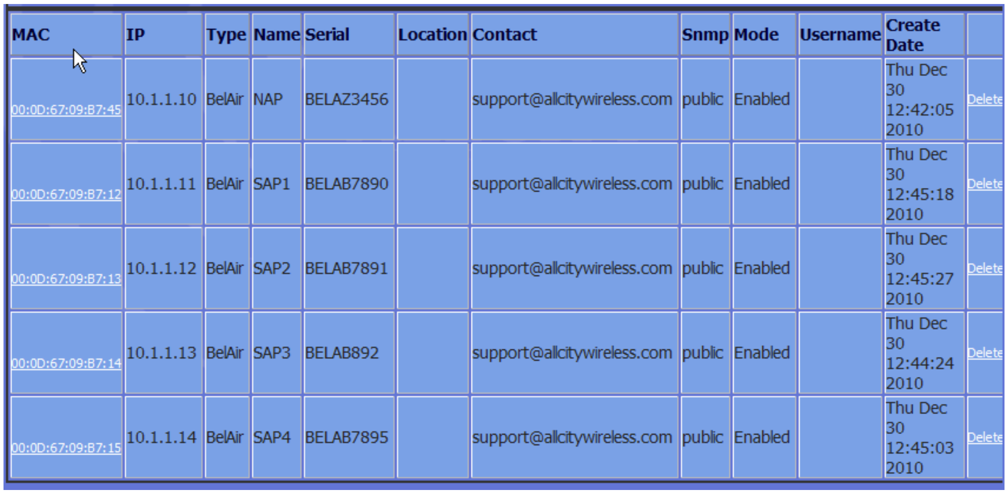
New Access Point

MAC	
IP	
Alternate IP	
Type	Nortel AP
Name	
Location	
Contact Info	
Serial Num	
SNMP	
Latitude	
Longitude	
Mode (@NAP, AP)	
Status	Enabled
Username	
Password	(Enter a new password to update)
Submit	Cancel

Nortel AP
Meraki
Proxim
Tropos
BelAir
BelAir 100 (Auto Configure)
BelAir 200 (Auto Configure)
EnGenius ECB3500 (Auto Configure)
EnGenius ECB9500 (Auto Configure)
Bridge
Other

Figure 3-8: Adding Access Point

Figure 3-9 shows the way the access point page should look after all the access points have been added:



MAC	IP	Type	Name	Serial	Location	Contact	Snmp	Mode	Username	Create Date	
00:0D:67:09:B7:45	10.1.1.10	BelAir	NAP	BELAZ3456		support@allcitywireless.com	public	Enabled		Thu Dec 30 12:42:05 2010	Delete
00:0D:67:09:B7:12	10.1.1.11	BelAir	SAP1	BELAB7890		support@allcitywireless.com	public	Enabled		Thu Dec 30 12:45:18 2010	Delete
00:0D:67:09:B7:13	10.1.1.12	BelAir	SAP2	BELAB7891		support@allcitywireless.com	public	Enabled		Thu Dec 30 12:45:27 2010	Delete
00:0D:67:09:B7:14	10.1.1.13	BelAir	SAP3	BELAB892		support@allcitywireless.com	public	Enabled		Thu Dec 30 12:44:24 2010	Delete
00:0D:67:09:B7:15	10.1.1.14	BelAir	SAP4	BELAB7895		support@allcitywireless.com	public	Enabled		Thu Dec 30 12:45:03 2010	Delete

Figure 3-9: All Access Points Added

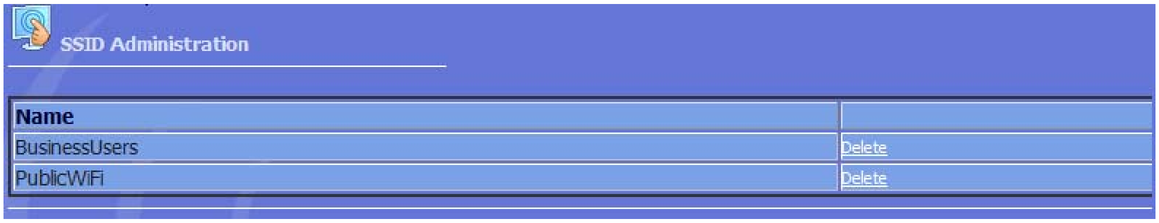
3.2.1.6 Verifying DHCPD configuration

Only minor changes need to be made to the DHCP configuration file for this example. The configuration file can be found on the **Services->DHCP** page. The subnet section in the DHCP server configuration file needs to be modified to include the 10.5.1.0/24 subnet. The subnet section of the file should look like this:

```
# Private Subnet 10.4.1.0/24
subnet 10.4.1.0 netmask 255.255.255.0 {
   range 10.4.1.20 10.4.1.254;
   option routers 10.4.1.1;
   option domain-name-servers 10.4.1.1;
   option ntp-servers 10.4.1.1;
   option subnet-mask 255.255.255.0;
}

subnet 10.5.1.0 netmask 255.255.255.0 {
   range 10.5.1.20 10.5.1.254;
   option routers 10.5.1.1;
   option domain-name-servers 10.5.1.1;
   option ntp-servers 10.5.1.1;
   option subnet-mask 255.255.255.0;
}
```

3.2.1.7 Add SSID

The WiDirect still needs to know about the SSID for branding and reporting purposes. Since this network will use the default branding, the SSID only needs to be created. By clicking on ***System Configuration->SSIDs***, the SSID can be added as in Figure 3-10. For this example there are going to be two SSIDs.

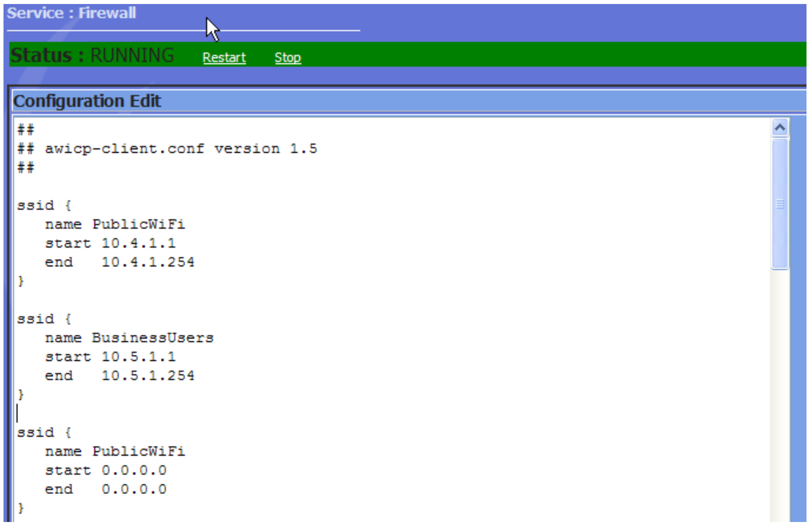


SSID Administration

Name	
BusinessUsers	Delete
PublicWiFi	Delete

Figure 3-10: SSID Creation

Rules also have to be created in the firewall to determine which users belong in which SSID. Clicking on the **Services**->**Firewall** link will allow you to modify the firewall rules. The 10.4.1.0/24 subnet will be on the PublicWiFi SSID, and the 10.5.1.0/24 subnet will be on the BusinessUsers SSID. A default SSID will also be created as an example. Figure 3-11 shows the configuration file with the SSID settings applied.

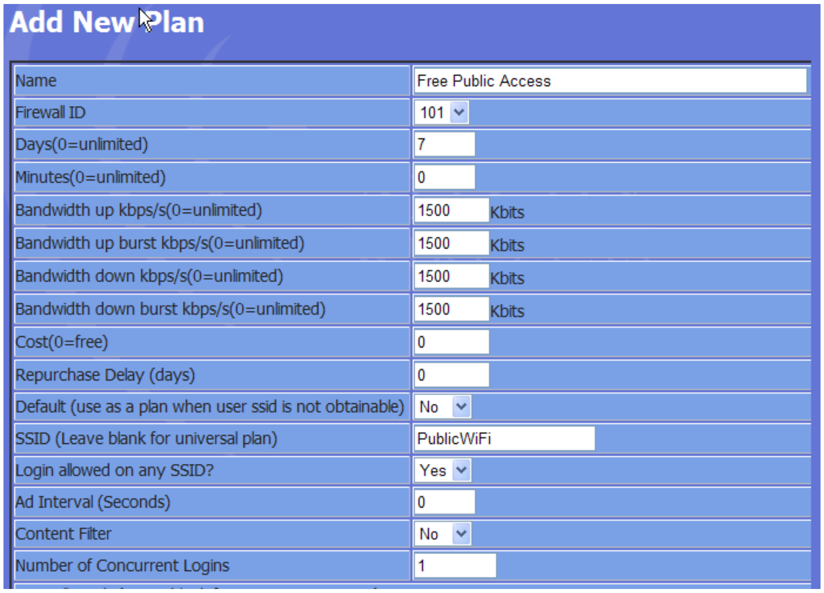


```
##
## awicp-client.conf version 1.5
##

ssid {
   name PublicWiFi
   start 10.4.1.1
   end   10.4.1.254
}

ssid {
   name BusinessUsers
   start 10.5.1.1
   end   10.5.1.254
}

ssid {
   name PublicWiFi
   start 0.0.0.0
   end   0.0.0.0
}
```

Figure 3-11: Create SSIDs in Firewall

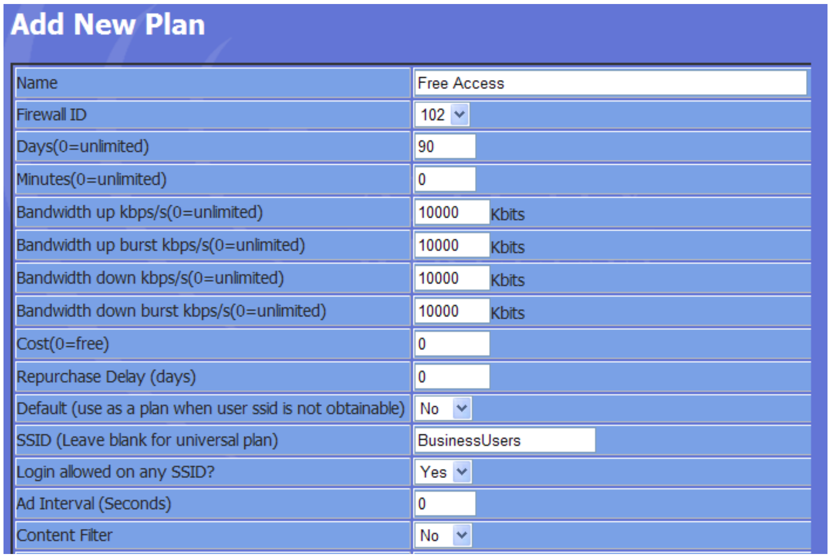
3.2.1.8 Create Access Plans

For this sample network, two access plans will be created. Figure 3-12 shows the setup for the public plan and Figure 3-13 shows the setup for the business plan. The time restrictions can be left blank for the default values. To prevent the plans from being seen by users on the wrong SSID, the SSID field should be set properly, and the Default option should be set to No.



Name	Free Public Access
Firewall ID	101
Days(0=unlimited)	7
Minutes(0=unlimited)	0
Bandwidth up kbps/s(0=unlimited)	1500 Kbits
Bandwidth up burst kbps/s(0=unlimited)	1500 Kbits
Bandwidth down kbps/s(0=unlimited)	1500 Kbits
Bandwidth down burst kbps/s(0=unlimited)	1500 Kbits
Cost(0=free)	0
Repurchase Delay (days)	0
Default (use as a plan when user ssid is not obtainable)	No
SSID (Leave blank for universal plan)	PublicWiFi
Login allowed on any SSID?	Yes
Ad Interval (Seconds)	0
Content Filter	No
Number of Concurrent Logins	1

Figure 3-12: Creating the Public Access Plan



Add New Plan

Name	Free Access
Firewall ID	102
Days(0=unlimited)	90
Minutes(0=unlimited)	0
Bandwidth up kbps/s(0=unlimited)	10000 Kbits
Bandwidth up burst kbps/s(0=unlimited)	10000 Kbits
Bandwidth down kbps/s(0=unlimited)	10000 Kbits
Bandwidth down burst kbps/s(0=unlimited)	10000 Kbits
Cost(0=free)	0
Repurchase Delay (days)	0
Default (use as a plan when user ssid is not obtainable)	No
SSID (Leave blank for universal plan)	BusinessUsers
Login allowed on any SSID?	Yes
Ad Interval (Seconds)	0
Content Filter	No

Figure 3-13: Creating the Business Access Plan

3.2.1.9 Create Administrators

New boxes should have the default administrator password changed and new admin users should be created. See Section 1.6.11.

3.2.1.10 Setting SSID Preferences

Each SSID can have its own configuration values. If a different SSID setting is required, such as a different redirect page, they can be set in the preferences section. See Section 1.4.1.

3.2.1.11 Branding the User Pages

Setting the branding allows administrators to configure the branding of the user facing pages, such as the login page. If the installation calls for specific graphics and html for these pages, see section 1.4.4.

3.2.1.12 Setting Walled Garden Sites

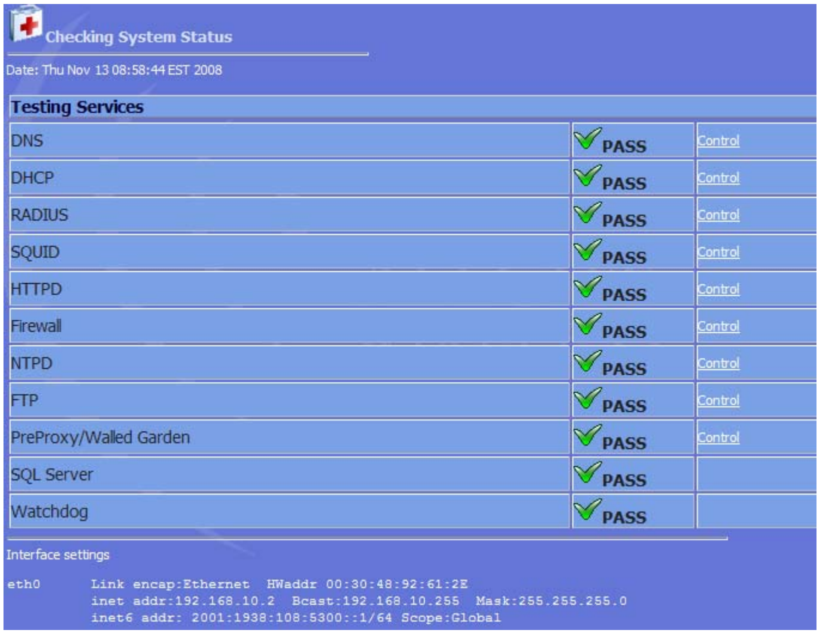
The walled garden allows access to various sites without login to the WiDirect. These sites vary from depending on the policies of the local network. To configure the walled garden see Section 1.4.2

3.2.1.13 Configuring the Message of the Day

The message of the day allows a message to be displayed on the login page, which is something that needs to be tailored for each installation. This page can be left blank if no message is desired. See section 1.4.3 on how to configure it.

3.2.1.14 System Check

At this point, all the basic system elements have been configured for this network. Before attempting to login to the Network, click on the **System Check** menu to verify that all the services are enabled and **PASS** the system check. Also, use this page to verify that the IP address is set properly on the ETH0 interface.



Checking System Status

Date: Thu Nov 13 08:58:44 EST 2008

Testing Services		
DNS	✓ PASS	Control
DHCP	✓ PASS	Control
RADIUS	✓ PASS	Control
SQUID	✓ PASS	Control
HTTPD	✓ PASS	Control
Firewall	✓ PASS	Control
NTPD	✓ PASS	Control
FTP	✓ PASS	Control
PreProxy/Walled Garden	✓ PASS	Control
SQL Server	✓ PASS	
Watchdog	✓ PASS	

Interface settings

```
eth0      Link encap:Ethernet  HWaddr 00:30:48:92:61:2E
          inet addr:192.168.10.2  Bcast:192.168.10.255  Mask:255.255.255.0
          inet6 addr: 2001:1938:108:5300::1/64 Scope:Global
```

Figure 3-14 Running the System Check

3.2.2 Acceptance Testing of Sample Network

For this network, there only two features that are really required to be tested. The first is the ***AP Status*** page, which verifies that the AP's are up and monitored. The second test is to actually associate to an Access Point wirelessly and test the Internet Connection.

3.2.2.1 *Run AP status to see if the Access Points are up*

Click on the **System Status-> AP Status** link and verify that all the Access Points are UP

3.2.2.2 *Access the Internet Wirelessly*

Using a laptop, physically move to the nearest access point and try to connect to the **Annapolis Wireless** SSID. If everything has been configured properly, after associating to the access point, the WiDirect will provide the laptop with a DHCP address in the 10.4.1.0/24 subnet.

After an IP address has been provided, open a browser and connect to the Internet. If everything is running properly, the **Captive Portal Login** page will be displayed. Register for an account and login to the network.

At this point, the bare network configuration has been completed. For more system checks, see the **Administration and Maintenance** section later in this document.

4 Special Deployment Scenarios

4.1 Turning off External DNS Resolution

In some deployments, if DNS service is unstable, disabling it at the WiDirect allows the mesh to remain up during DNS server outages. Only the DNS service at the mobile nodes will be interrupted instead of the entire mesh.

To perform this operation, command line access is required on the WiDirect. Login via ssh to the WiDirect.

Step 1: Edit the /etc/nsswitch conf file

Run the command *sudo vi /etc/nsswitch.conf*. Look for the line that reads “host : files dns” and change it to say “hosts: files”

Step 2: Edit the /etc/resolv.conf file

Run the command *sudo vi /etc/resolv.conf* file. Any lines that say “nameserver” add a “#” to the beginning of the line.

Step 3: Edit the ap.ftp file

Use the gui **Admin** page and click on ***Nortel Support->Ftp***. Look for entries in the dhcpd file that being with “domain-name-server”, there should be at least two entries, all of them need to be changed to the IP address of the upstream DNS server. This is the same IP address that was added in the network configuration window of the WiDirect.

Step 4: Reboot the mesh

At this point, the entire mesh will need to be restarted for the DNS changes to take effect.

4.2 Enabling MAC Authentication For Specific Stations

Normally, the WiDirect can only run in MAC based authentication mode for all users at once. In other words, MAC based authentication is enabled for all hosts or it is disabled for all hosts.

However, there might be certain situations where only a portion of the devices on your network to be MAC based authenticated. For example, a set of hardware that doesn't have web browsers enabled, such as hand held inventory scanners. It is still possible to do this by assigning specific addresses to these devices and then opening the firewall for them. The following steps describe this procedure:

Step 1: Assign a static IP address to each device.

> In the DHCPD.conf file (access from the admin page Services->Dhcpd), you can create an entry for EACH device in the Mobile Node IP pool.

For example, a wireless security camera with a MAC of 00:0F:3D:56:03:43. We could assign the IP of 10.8.1.250. In the DHCPD.conf file, add the following line.

```
host camera2 { hardware Ethernet 00:0F:3D:56:03:43; fixed-address 10.8.1.250; }
```

In this example, this camera is named "camera2" but any name would have been acceptable as long as the name is unique among all entries in the dhcpd file.

Step 2: Add the static IP address to the firewall configuration file.

Access the firewall configuration file from the WiDirect **Admin** page (***Services->Firewall***)

In this configuration file, there is a line called "TrustedIPList", which allows as many IP addresses as needed, as long as they are comma separated. Any IP addresses listed in this line are automatically “passed through" the captive portal without a web based login challenge.

In this example, let's say we had two IP addresses to add 10.8.1.250 and 10.8.1.251.

The configuration file would look like this:

```
TrustedIPList 10.8.1.250,10.8.1.251
```

After those two steps have been completed, the devices are ready for captive portal pass through without login challenge.

4.3 Entering Ingress (From Internet) Firewall Rules

The WiDirect software uses iptables to manage the firewall. When the WiDirect starts up, it uses iptables to define new firewall rules. However, the default firewall rules can be modified by the Administrator. The default iptables file that is shipped with the WiDirect looks like this:

```
*filter
:FORWARD ACCEPT [0:0]
:INPUT DROP [0:0]
:OUTPUT ACCEPT [0:0]
-A INPUT -m state --state RELATED,ESTABLISHED -j ACCEPT
-A INPUT -i eth0 -p tcp -m tcp --dport 22 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -i eth0 -p tcp -m tcp --dport 80 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -i eth0 -p tcp -m tcp --dport 443 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -i eth0 -j REJECT --reject-with icmp-port-unreachable
-A INPUT -p tcp -m tcp --dport 8060 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p tcp -m tcp --dport 8061 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p tcp -m tcp --dport 8062 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p tcp -m tcp --dport 20 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p tcp -m tcp --dport 21 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p tcp -m tcp --dport 22 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p udp -m udp --dport 53 -j ACCEPT
-A INPUT -p udp -m udp --dport 67 -j ACCEPT
-A INPUT -p udp -m udp --dport 68 -j ACCEPT
-A INPUT -p tcp -m tcp --dport 80 -j ACCEPT
-A INPUT -p tcp -m tcp --dport 7911 -j ACCEPT
-A INPUT -p udp -m udp --dport 123 -j ACCEPT
-A INPUT -p tcp -m tcp --dport 123 -j ACCEPT
-A INPUT -p udp -m udp --dport 514 -j ACCEPT
-A INPUT -p icmp --icmp-type 0 -j ACCEPT
-A INPUT -i eth1 -p icmp --icmp-type 8 -s 0/0 -m state --state NEW,ESTABLISHED,RELATED -j ACCEPT
-A INPUT -p tcp -m tcp --dport 443 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p tcp -m tcp --dport 1813 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p udp -m udp --dport 1813 -j ACCEPT
-A INPUT -p tcp -m tcp --dport 1812 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -p udp -m udp --dport 1812 -j ACCEPT
```

```
-A INPUT -i lo -j ACCEPT
COMMIT
# Completed on Sun Jun  4 17:19:16 2006
# Generated by iptables-save v1.3.0 on Sun Jun  4 17:19:16 2006
*nat
:OUTPUT ACCEPT [401:23400]
:POSTROUTING ACCEPT [375:21730]
:PREROUTING ACCEPT [144:12599]
-A POSTROUTING -o eth0 -j MASQUERADE
COMMIT
```

These rules can be modified as Administrators see fit. (See the Disabling NAT section 4.5 in this document for an example.) To edit this file, connect to the command line interface and run the following command:

```
sudo vi /etc/sysconfig/iptables
```

After editing the file, it is best to reboot the WiDirect for the changes to take effect due to the amount of software that relies on the iptables file.

For more information on editing the iptables file, consult the netfilter documentation at:
http://www.netfilter.org.

4.4 Disabling DHCP Dependency

An often overlooked aspect of the DHCPD configuration file is to disable DHCP service on the ETH0 (Internet facing) interface. In order to do this, add an entry to the dhcpd configuration file that instructs dhcpd to ignore Eth0's IP range.

For example, if Eth0's IP and subnet was 192.168.20.2 with a subnet mask of 255.255.255.0. A "blank" configuration line for this subnet would be needed in the dhcpd configuration file to tell DHCP not to provide service on this interface., The dhcpd.conf line looks like this

```
subnet 192.168.20.0 netmask 255.255.255.0 {}
```

When DHCPD starts up, it sees this as not needing to provide dhcpd to this IP space and will 'disable' DHCP on the ETH0 interface.

4.5 Disabling NAT (Network Address Translation)

If you want to provide routable IP space to your Mobile Nodes, you can disable NAT on your WiDirect. In order to do this, you must be familiar with a command line editor such as VI or EMACS. In this example, we'll show the VI commands.

If you are disabling NAT, you will need a routable subnet on intranet and extranet networks. You can still use private subnets such as 10.0.0.0/8, as long as it's routable beyond the WiDirect box. The WiDirect is just going to act as a firewall without NAT enabled.

SSH to the WiDirect and run the following command:

```
sudo vi /etc/sysconfig/iptables
```

Use the arrow keys to find this line:

```
-A POSTROUTING -o eth0 -j MASQUERADE
```

Comment out this line by adding a "#" in front of it. Save the file and exit the VI editor.

The WiDirect should be rebooted for this change to take effect, which can be done from the ***Admin*** page ***SystemConfig ->Shutdown***.

4.6 How to Disable Mobile Node Access to the Admin Pages

On some networks, more security might be required for the WiDirect Admin pages. In fact, it's recommended that this security measure be added anywhere there isn't tight security on the network.

The WiDirect admin page has built in security where three failed login attempts will lock out an IP address for 15 minutes. However, if needed, it is possible to disable admin login page attempts completely from the Mobile Network. In order to do this, SSH to the WiDirect and run this command.

```
sudo vi /root/AWICP/www/portal/admin/.htaccess
```

In this file, add the following lines. changing the IP address as needed.

```
<Files *>
order allow,deny
allow from all
deny from 10.8.1.0/24
</Files>
```

Change the 10.8.1.0/24 to be the IP subnet range of your mobile network.

4.7 Login and Logout URL

On some networks, it might be desirable to allow users to completely logoff the WiDirect instead of letting them timeout. This can be accomplished by providing a ***Logout*** button to the users on an external web page on a different server. If there is a homepage that users have access to, the following URL can be used on that page to create a ***Logout*** button.

http://10.4.1.1:8060/awicp/logout

There may also be instances where you want to give users a link to login, such as when you redirect users to a landing page instead of the login page. The login page can be accessed at the following URL:

http://10.4.1.1:8060/

In both instances, change the 10.4.1.1 IP address to the IP address of ETH1 interface of the WiDirect. It MUST be the ETH1 IP address.

4.8 Sendmail SMTP Configurations

Depending on the deployment, most networks have a special SMTP Relay that email must be sent in order to leave the network. In other words, the WiDirect will not be able to send output email without relaying through the SMTP relay host.

The email/SMTP controller that runs on the WiDirect is called Sendmail, which is a standard SMTP process that runs on most servers. In order to configure the Sendmail, an Administrator must SSH to the WiDirect and edit the Sendmail configuration with the following command:

```
sudo vi /etc/mail/sendmail.cf
```

4.8.1 Updating the SMTP domain name

In this file, there are several fields that can be modified. The first setting is the “domain name” of the WiDirect, this is used to explicitly tell Sendmail what domain to use when addressing outbound email. For example, if the local network's domain was “companyxyz.com”, find the following lines in the sendmail.cf file:

```
# my official domain name
# ... define this only if sendmail cannot automatically determine your domain
#Dj$w.Foo.COM
```

And change it to:

```
# my official domain name
# ... define this only if sendmail cannot automatically determine your domain
Dj$w.companyxyz.com
```

4.8.2 Adding an SMTP Relay

If a SMTP email is required on the network, this can be done by adding a DS entry to the sendmail.cf file. Find the line in the sendmail.cf that looks like this:

```
# "Smart" relay host (may be null)
DS
```

If the local SMTP relay was smtp.companyxyz.com, change these lines to read:

```
# "Smart" relay host (may be null)
DSsmtp.companyxyz.com
```

4.8.3 Restarting the Sendmail Process

After making changes to the sendmail.cf, Sendmail can be restarted via an init script or simply rebooting the WiDirect. To restart the process from the CLI, use the following command:

```
/etc/init.d/sendmail restart
```

4.9 Performing a System Backup

In order to backup the WiDirect, SSH to the WiDirect (Section 2.1) and run the following commands:

```
cd /root/AWICP/bin
sudo ./doBackup.sh
```

This will create a backup image of the WiDirect. After the backup is complete, the system will prompt:

```
Would you like to burn this backup directly to a CD[y/n]
```

If a CD backup is desired you must connect a USB recordable CD drive to the WiDirect, insert a BLANK recordable CD into a USB CD drive and enter 'y', otherwise type 'n' and Enter.

After the backup is complete, the WiDirect will tell you where the backup tar file is on the WiDirect, which can be retrieved via SCP to another server.

```
Dump complete. You can pull the file from /root/backup-XXXXXX.tar.gz
```

To SCP the backup file to another server, use this command:

```
scp /root/backup=XXXXXX.tar.gz username@a.b.c.d:.
```

(Where username and a.b.c.d are actual hostanames and IP addresses)

Backup files can also be saved to thumbdrives with the following commands:

```
sudo mount /dev/sdb1 /mnt
sudo cp /root/backup-XXXXXXXX.tar.gz /mnt/.
sudo umount /dev/sdb1
```

4.10 Performing a System Recovery

In order to restore a backup, SSH to the WiDirect (Section 2.1) and copy the backup file to the WiDirect into the /tmp directory. This can be done several different ways as described below.

SCP

```
sudo scp username@a.b.c.d:backup-XXXXX.tar.gz /tmp/.
```

CD-R

```
sudo mount /dev/cdrom /mnt
sudo cp /mnt/backup-XXXXXX.tar.gz /tmp/.
sudo umount /dev/cdrom
```

Thumbdrive

```
sudo mount /dev/sdb1 /mnt
sudo cp /mnt/backup-XXXXXX.tar.gz /tmp/.
sudo umount /dev/sdb1
```

Once the backup file is run on the WiDirect, perform the backup with the following commands.

1. CD to the tmp directory

```
cd /tmp
```

2. Gunzip the file

```
sudo gunzip /tmp/backup-XXXXXX.tar.gz
```

3. Untar the file. Use this tar command with the exact options

```
sudo tar xfP /tmp/backup-XXXXXX.tar
```

4. Cd to the newly created directory, which will always be /root/backup-XXXXX

```
cd /root/backup-XXXXXX
```

5. Run the backup command

NOTE: Run this command from this directory only (as described in step 4)

```
sudo ./recoverBackup.sh
```

6. Reboot the WiDirect

```
sudo reboot
```

Note: If you are performing a recovery to a new physical WiDirect, a new license will need to be installed after the recovery. Contact support@allcitywireless.com for a new license.

5 Administration & Maintenance

5.1 System Status

When the WiDirect is active there several tasks that can be manually viewed to ensure the network is functioning as it should. Where the software is located is a decision of the administrator. It can be installed in the *NortelWarp* user's home directory or the *t1* user's directory. (To access user *t1*, use the password ***testing***.)

For example, if the file was called AP_3.2.bin, use SCP to put the file on the WiDirect:

```
scp AP_3.2.bin  nortelWarp@10.4.1.1/.
```

Then instruct the AP's to download the new image from the WiDirect (via ftp) as in this example:

```
> swdld
> set server 10.4.1.1
> set user nortelWarp
> set passwd nortelWarp
> set image AP_3.2.bin
> show
> start
> status
```

This example is only for reference. To learn more about the Nortel upgrade procedure, please see the Nortel documentation

5.2 Active Users

A list of active users can be displayed. It will provide the locale they are in while accessing, how long they have been on, how much traffic they have passed, and a button is available to log the user off. Other information available is current IP address and MAC address of user.

5.3 Event Viewer

Under the Event Viewer various messages are displayed with severity of event and a timestamp. If Access Points are rebooting or Clients are unresponsive the event viewer would report it, as well as when the last time an Administrator logged into the WiDirect Management Console. The ***Event Viewer*** is also able to be sorted by date, severity, or event description.

5.4 AP Status and Transit Link Graph

The Transit Link (TL) Graph is a visual representation of Access Points communicating with each other. The TL graph will show if all APs are connected and the strength of the TL signal between them. If an AP is orphaned, it will not show a connection to the other access points.

5.5 System Check

By clicking on ***System Check,*** the WiDirect displays a list of all the services the WiDirect is running. Green checks indicate that all systems are functioning properly. If a service is not running it can be forced to restart. Below the services information portion of the page is information that pertains to connectivity. IP, Time, and routing information are available on the ***System Status*** page.

5.6 System Verification

5.6.1 Verify Processes

Under the **Admin** page, there is a ***System Status->System Check*** button. This page analyzes all the running process and provides and up/down process. If for any reason a process is disabled, you can click on the ***Control*** button next to each process in order to re-enable it.

As for the WiDirect specific processes, there is an internal watchdog program that will automatically restart any WiDirect process that should be running.

5.6.2 Verify Captive Portal Features

Once the WiDirect has been setup, verification of the Captive Portal features requires a laptop to be able to associate to the Wireless mesh. Once connected to an Access Point, try connecting to a web page such as www.google.com. If the Captive Portal is working probably (and www.google.com is not in the walled garden), the WiDirect will intercept the web request and present the Captive Portal Login page.

5.6.3 Speed Testing

The WiDirect has built in speed monitoring software. To view the output of this program in real time, SSH into the WiDirect box as user '**portal**' and execute this command:

```
bwm-ng
```

Another test is to use http://www.speedtest.net while connected to the mesh. This URL allows you to choose a server that is geographically located close to the network. Click on the server to use and a speed will automatically run that provides both download and upload speeds.

5.6.4 Ping Test

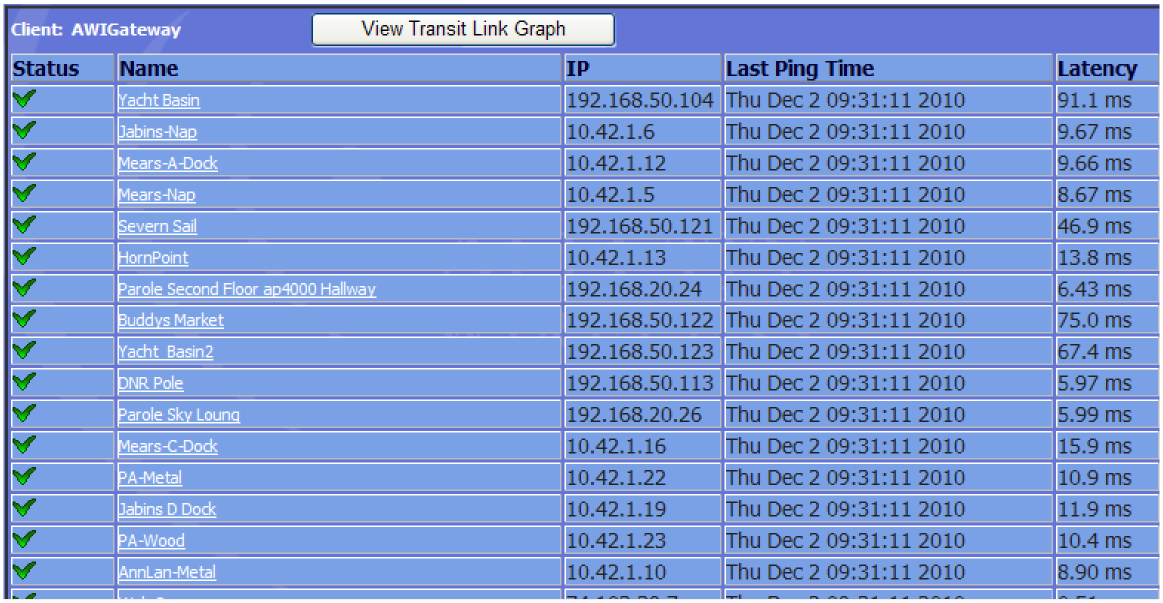
To verify connectivity to the Wireless Gateway or to an Access point, an Administrator can send a ping from the WiDirect to the Wireless gateway. Click on ***Tools->Ping*** on the ***Admin*** page and enter the IP address of the Wireless Gateway.

5.6.5 DNS Verification

To verify DNS service, use the ***Tools->DNS Query*** tool. Try looking up a public web server such as www.google.com or www.yahoo.com.

5.6.6 Verify APs

Clicking on the ***System Status->Ap Status*** page will provide a list of all the Access Points that are currently monitored by the WiDirect. This page provides a quick way to verify the operation of the Access Points.



Status	Name	IP	Last Ping Time	Latency
✓	Yacht Basin	192.168.50.104	Thu Dec 2 09:31:11 2010	91.1 ms
✓	Jabins-Nap	10.42.1.6	Thu Dec 2 09:31:11 2010	9.67 ms
✓	Mears-A-Dock	10.42.1.12	Thu Dec 2 09:31:11 2010	9.66 ms
✓	Mears-Nap	10.42.1.5	Thu Dec 2 09:31:11 2010	8.67 ms
✓	Severn Sail	192.168.50.121	Thu Dec 2 09:31:11 2010	46.9 ms
✓	HornPoint	10.42.1.13	Thu Dec 2 09:31:11 2010	13.8 ms
✓	Parole Second Floor ap4000 Hallway	192.168.20.24	Thu Dec 2 09:31:11 2010	6.43 ms
✓	Buddys Market	192.168.50.122	Thu Dec 2 09:31:11 2010	75.0 ms
✓	Yacht_Basin2	192.168.50.123	Thu Dec 2 09:31:11 2010	67.4 ms
✓	DNR Pole	192.168.50.113	Thu Dec 2 09:31:11 2010	5.97 ms
✓	Parole Sky Loung	192.168.20.26	Thu Dec 2 09:31:11 2010	5.99 ms
✓	Mears-C-Dock	10.42.1.16	Thu Dec 2 09:31:11 2010	15.9 ms
✓	PA-Metal	10.42.1.22	Thu Dec 2 09:31:11 2010	10.9 ms
✓	Jabins D Dock	10.42.1.19	Thu Dec 2 09:31:11 2010	11.9 ms
✓	PA-Wood	10.42.1.23	Thu Dec 2 09:31:11 2010	10.4 ms
✓	AnnLan-Metal	10.42.1.10	Thu Dec 2 09:31:11 2010	8.90 ms

6 Software

6.1 Software Upgrades & Patching

All upgrades will be scripts that are scp'd to the WiDirect by the customer or by AllCity Wireless engineers depending on service contracts. For example, a patch might be issued called widirect-patch-1.2.1-002. Customers can download this patch at our support site with the appropriate login credentials.

To activate the upgrade:

1) Copy the file to WiDirect. If using putty from a windows client:

```
c:\pscp.exe widirect-patch-1.5-001.tar portal@a.b.c.d:.
```

(where a.b.c.d is ip address of widirect box)

2) Ssh to WiDirect box as portal user
3) Run the patch with sudo:

```
tar xf widirect-patch-1.5-001.tar
cd widirect-patch-1.5-001
sudo ./install.sh
```

4) reboot

6.2 Logs and Log Rotation

Via the ***Systems Configuration*** menu. Administrators can use the ***Log Viewer*** to view and download various system log files. In addition to viewing a static log, the ability to view log files in real-time is enabled by default to assist in network performance monitoring and troubleshooting.

All log files are rotated every night automatically. Each log file can be a maximum of 1 Mb in size and only the last five log rotations are kept.

6.3 Log Location

Most standard logs can be viewed from the ***Admin*** interface menu ***System Configuration* -> *Logs***. However, if you want more detailed log analysis, SSH to the WiDirect and locate the following log files:

radius	/var/log/radius/radius.log
dhcpd	/var/log/messages
awicp	/root/AWICP/logs/portal.log
awicp-manager	/root/AWICP/logs/manager.log
general syslog	/var/log/messages
nortel messages	/var/log/nortel.log
ftp log	/var/log/xferlog

7 Hardware Diagrams

This section shows the physical port layout of the WiDirect. Figure 7-1 shows the front of the WiDirect

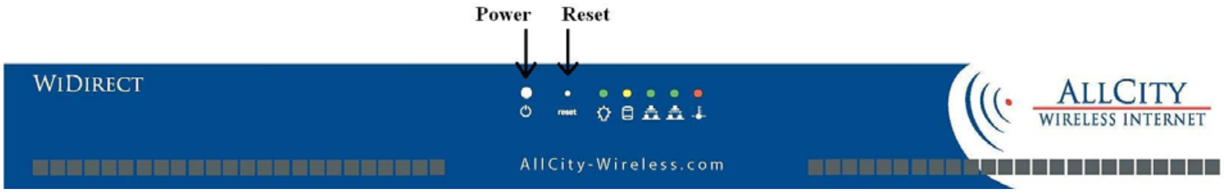


Figure 7-1: Front of WiDirect

The front of the WiDirect consists of a DVD/CD-RW drive, a **power** button and a **reset** button.
The LEDs from left to right are power, hard disk activity, Eth0 network activity, Eth1 network activity and temperature alarm.

Figure 7-2 shows the back of the Base WiDirect.

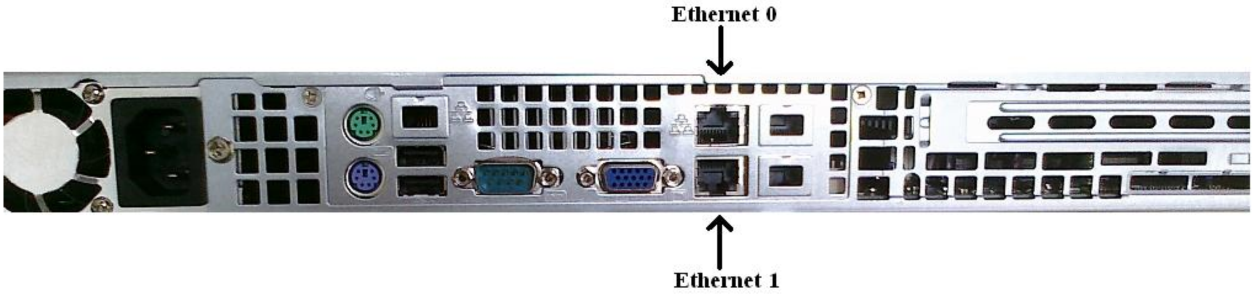


Figure 7-2: Back of the WiDirect

The important ports on the back of the WiDirect are Serial, Eth0, and Eth1. The serial port (green 9 pin) can be used with a null modem cable (9600 baud) to reach the Command Line prompt.

Eth0 and Eth1 are the network connections on the WiDirect. The Eth0 should be plugged into the Internet side and the Eth1 should be connected to the “Wireless mesh side” of the network.

Warning: The mouse, keyboard and monitor ports are active and can be used if needed. However, if a keyboard is plugged into the WiDirect, it should not be removed unless the system is first shut down.

Figure 7-3 shows the back of the WiDirect Pro and WiDirect Enterprise.

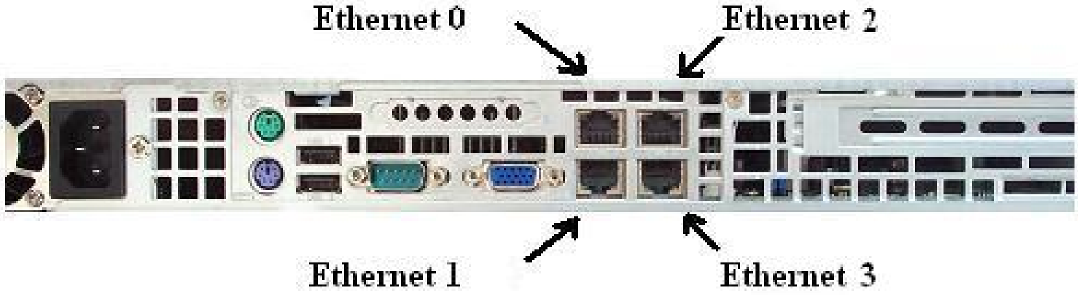


Figure 7-3: Back of the WiDirect Pro and WiDirect Enterprise

The important ports on the back of the WiDirect Pro and Enterprise are Serial, Eth0, Eth1, Eth2 and Eth 3. The serial port (green 9 pin) can be used with a null modem cable (9600 baud) to reach the Command Line prompt.

Eth0 and Eth1 are the network connections on the WiDirect. The Eth0 should be plugged into the Internet side and the Eth1 should be connected to the “Wireless mesh side” of the network.

Warning: The mouse, keyboard and monitor ports are active and can be used if needed. However, if a keyboard is plugged into the WiDirect, it should not be removed unless the system is first shut down.

Figure 7-4 shows the Front of the WiDirect Micro

Figure 7-4: Front of WiDirect Micro

Figure 7-5 shows the back of the WiDirect Micro

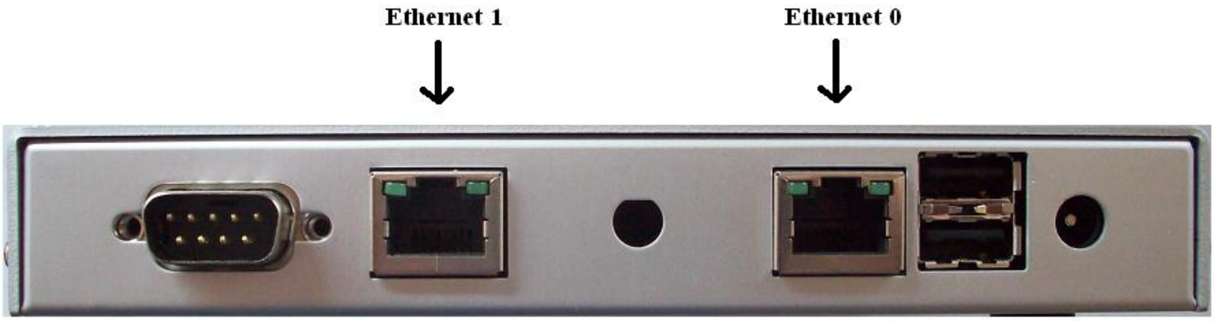


Figure 7-5: Back of WiDirect Micro

The important ports on the back of the WiDirect Micro are Serial, Eth0, and Eth1. The serial port (far left) can be used with a null modem cable (38,400 baud) to reach the Command Line prompt.

Eth0 and Eth1 are the network connections on the WiDirect. The Eth0 should be plugged into the Internet side and the Eth1 should be connected to the “Wireless mesh side” of the network.

8 Technical Support

Support Contact Details

Dedicated Phone Support:	(443) 951-1392
Dedicated e-mail support:	support@allcitywireless.com
Self-support:	www.allcitywireless.com/support
Corporate Address:	326 First Street Suite 38B Annapolis, MD 21403