USER MANUAL

All Appliance Models

Software Release 2.2

By:

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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
2.0	6/1/11	JB	Updated for version 2.0
2.1	11/11/11	DV	Updated for version 2.1
2.2	1/1/12	JB	Updated for version 2.2

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 gives the ability to segment the network into multiple profiles, and to give the user a unique user experience depending on their location.

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) WiClients can be added to expand the network size, both from local 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. The 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.* Other helpful answers to common questions can be found in *Section 4: Special Deployment Scenarios.*

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. See *Section 7: Hardware Diagrams* for a diagram of the Ethernet ports. The WiDirect will provide 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.

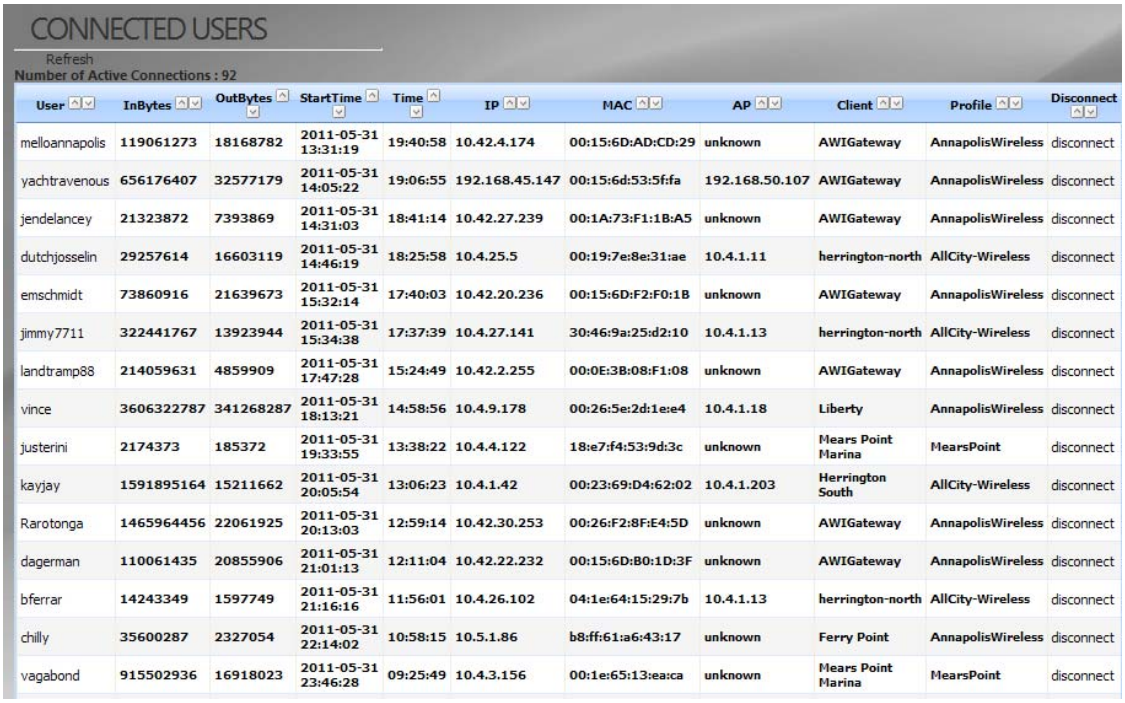
The table provides the username, traffic, start time, time connected, IP, MAC, Access Point (AP), Client, and Profile. See Table 1-1 for more information on each entry.

Field	**Description**
User	The username of the user connected to the WiDirect. Clicking this links brings up the user details 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 WiClients using the same subnet, then users may appear to be using the same IP address.
MAC	The user's current MAC address.
AP	The AP the user is on. Only available if the *getapfromradius* is enabled in the firewall. The AP will be determined either from RADIUS messages or from DHCP relay requests. See Firewall configuration for more information. Otherwise, the AP will display as "unknown."
Client	The client that the user is currently connected to.
Profile	The profile the user has associated with for this session. Profiles are used to provide a custom user experience depending on where the user is located.
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 : 92

User	InBytes	OutBytes	StartTime	Time	IP	MAC	AP	Client	Profile	Disconnect
melloannapolis	119061273	18168782	2011-05-31 13:31:19	19:40:58	10.42.4.174	00:15:6D:AD:CD:29	unknown	AWIGateway	AnnapolisWireless	disconnect
yachtravenous	656176407	32577179	2011-05-31 14:05:22	19:06:55	192.168.45.147	00:15:6d:53:5f:fa	192.168.50.107	AWIGateway	AnnapolisWireless	disconnect
jendelancey	21323872	7393869	2011-05-31 14:31:03	18:41:14	10.42.27.239	00:1A:73:F1:1B:A5	unknown	AWIGateway	AnnapolisWireless	disconnect
dutchjosselin	29257614	16603119	2011-05-31 14:46:19	18:25:58	10.4.25.5	00:19:7e:8e:31:ae	10.4.1.11	herrington-north	AllCity-Wireless	disconnect
emschmidt	73860916	21639673	2011-05-31 15:32:14	17:40:03	10.42.20.236	00:15:6D:F2:F0:1B	unknown	AWIGateway	AnnapolisWireless	disconnect
jimmy7711	322441767	13923944	2011-05-31 15:34:38	17:37:39	10.4.27.141	30:46:9a:25:d2:10	10.4.1.13	herrington-north	AllCity-Wireless	disconnect
landtramp88	214059631	4859909	2011-05-31 17:47:28	15:24:49	10.42.2.255	00:0E:3B:08:F1:08	unknown	AWIGateway	AnnapolisWireless	disconnect
vince	3606322787	341268287	2011-05-31 18:13:21	14:58:56	10.4.9.178	00:26:5e:2d:1e:e4	10.4.1.18	Liberty	AnnapolisWireless	disconnect
justerini	2174373	185372	2011-05-31 19:33:55	13:38:22	10.4.4.122	18:e7:f4:53:9d:3c	unknown	Mears Point Marina	MearsPoint	disconnect
kayjay	1591895164	15211662	2011-05-31 20:05:54	13:06:23	10.4.1.42	00:23:69:D4:62:02	10.4.1.203	Herrington South	AllCity-Wireless	disconnect
Rarotonga	1465964456	22061925	2011-05-31 20:13:03	12:59:14	10.42.30.253	00:26:F2:8F:E4:5D	unknown	AWIGateway	AnnapolisWireless	disconnect
dagerman	110061435	20855906	2011-05-31 21:01:13	12:11:04	10.42.22.232	00:15:6D:B0:1D:3F	unknown	AWIGateway	AnnapolisWireless	disconnect
bferrar	14243349	1597749	2011-05-31 21:16:16	11:56:01	10.4.26.102	04:1e:64:15:29:7b	10.4.1.13	herrington-north	AllCity-Wireless	disconnect
chilly	35600287	2327054	2011-05-31 22:14:02	10:58:15	10.5.1.86	b8:ff:61:a6:43:17	unknown	Ferry Point	AnnapolisWireless	disconnect
vagabond	915502936	16918023	2011-05-31 23:46:28	09:25:49	10.4.3.156	00:1e:65:13:ea:ca	unknown	Mears Point Marina	MearsPoint	disconnect

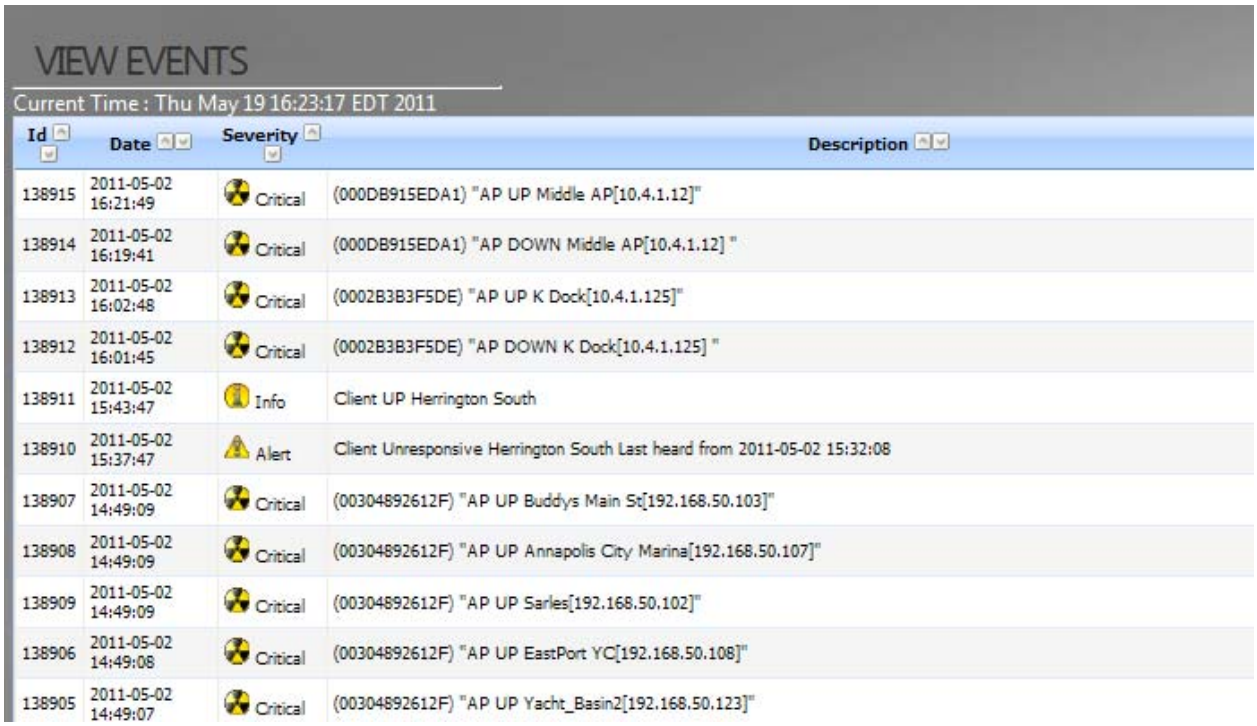
Figure 1-1: Active Users Screenshot

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.



Id	Date	Severity	Description
138915	2011-05-02 16:21:49	Critical	(000DB915EDA1) "AP UP Middle AP[10.4.1.12]"
138914	2011-05-02 16:19:41	Critical	(000DB915EDA1) "AP DOWN Middle AP[10.4.1.12] "
138913	2011-05-02 16:02:48	Critical	(0002B3B3F5DE) "AP UP K Dock[10.4.1.125]"
138912	2011-05-02 16:01:45	Critical	(0002B3B3F5DE) "AP DOWN K Dock[10.4.1.125] "
138911	2011-05-02 15:43:47	Info	Client UP Herrington South
138910	2011-05-02 15:37:47	Alert	Client Unresponsive Herrington South Last heard from 2011-05-02 15:32:08
138907	2011-05-02 14:49:09	Critical	(00304892612F) "AP UP Buddys Main St[192.168.50.103]"
138908	2011-05-02 14:49:09	Critical	(00304892612F) "AP UP Annapolis City Marina[192.168.50.107]"
138909	2011-05-02 14:49:09	Critical	(00304892612F) "AP UP Sarles[192.168.50.102]"
138906	2011-05-02 14:49:08	Critical	(00304892612F) "AP UP EastPort YC[192.168.50.108]"
138905	2011-05-02 14:49:07	Critical	(00304892612F) "AP UP Yacht_Basin2[192.168.50.123]"

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.

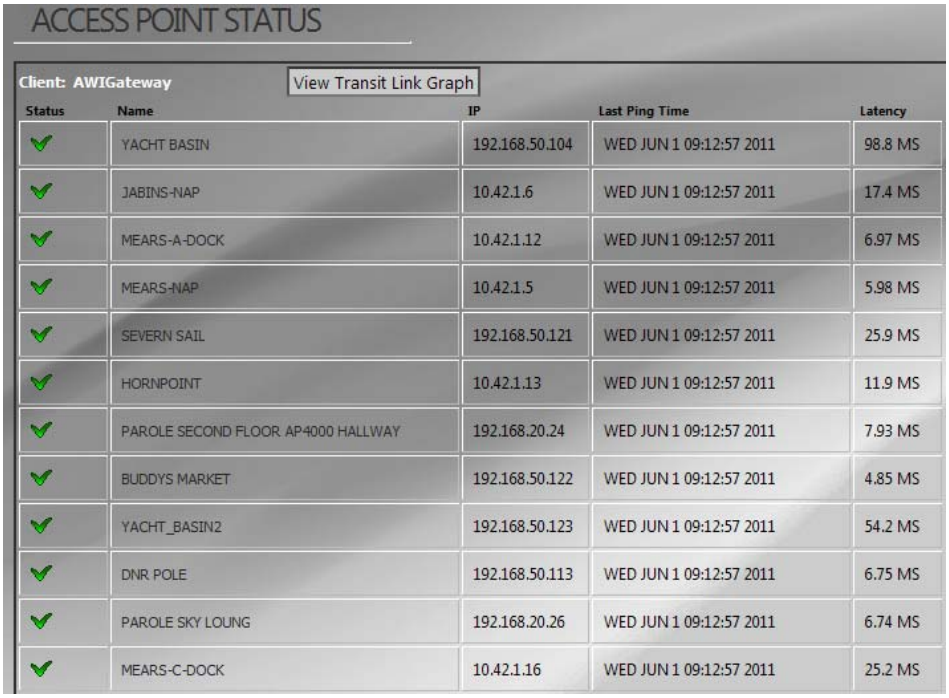


Figure 1-3: AP Status Page

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.

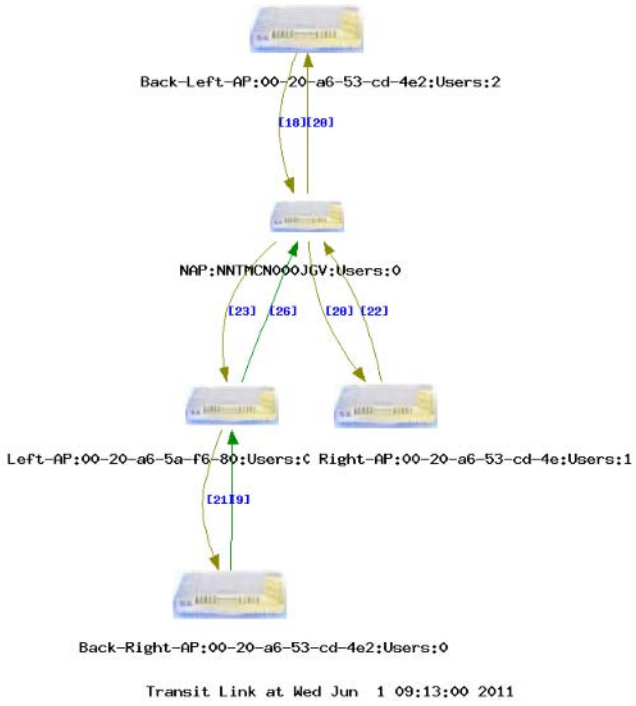


Figure 1-4: TL Graph Sample

1.2.5 Bridge Status

The ***Bridge Status*** page provides a quick overview of the up/down status of the wireless bridges being monitored by the WiDirect. Bridges are added using the same method as adding access points, except their type is set as a bridge. This page only reports the status of access points that are enabled and have their type set as a bridge.

Figure 1-5: Bridge Status Page

1.2.6 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 1-6. 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, click 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 the **Firewall** via the control window, the watchdog program understands this action and will not attempt to restart the firewall. 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.** Information here can indicate configuration errors if errors or dropped packets are reported. When contacting AWI technical support, the data on this page will be used to troubleshoot the health of the WiDirect.

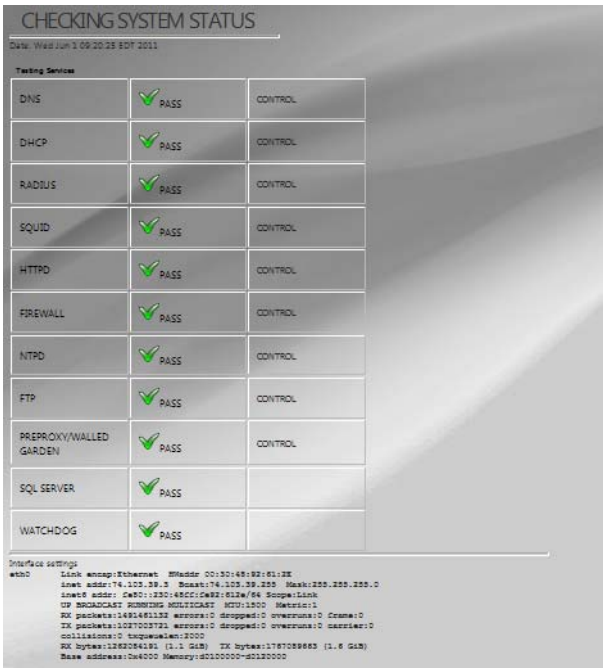


Figure 1-6: System Check

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.

VIEW USERS

Username	First Name	Last Name	Status	Last Login	Date Registered
anderson	Austin	Anderson	Expired	2011-05-01 12:39:44	2011-05-01 12:38:48
DJXN	Danyul	Jackson	Active	2011-05-02 10:49:43	2011-05-01 13:53:18
cmurphy	colin	Murphy	Expired	2011-05-01 14:52:34	2011-05-01 14:51:49
Adrew	Andrew	Borden	Purchasing		2011-05-01 15:25:34
crissmc	Christopher	Crabtree	Active	2011-05-01 15:54:11	2011-05-01 15:51:57
edock	tb	atkins	Active	2011-05-01 16:14:30	2011-05-01 16:13:00
koreanprs69	perry	galloway	Active	2011-05-01 16:36:14	2011-05-01 16:34:34
Ahinshaw	Amanda	Hinshaw	Active	2011-05-01 16:38:55	2011-05-01 16:38:18
Chadmongeon	Chad	Mongeon	Expired	2011-05-01 16:56:15	2011-05-01 16:53:38
johnnybgood	John	Best	Active	2011-05-02 07:17:09	2011-05-01 17:12:47
REX1	Mike	Hreczan	Active	2011-05-01 19:57:16	2011-05-01 19:56:52
tarz	Tara	Roberts	Active	2011-05-02 09:06:52	2011-05-01 20:18:47
tubbatubba	sdfdsf	sdfdsf	Expired	2011-05-01 21:26:36	2011-05-01 21:26:12
racerx	kevin	eason	Active	2011-05-01 23:02:46	2011-05-01 23:01:56
joyce_bandura	joyce	bandura	Active	2011-05-02 16:01:03	2011-05-02 08:45:55
ashley83	Ashley	Denningham	Active	2011-05-02 09:03:53	2011-05-02 09:02:29
danczer	Daniel	Czernicki	Active	2011-05-02 12:26:58	2011-05-02 09:12:44
slkunst	Sarah	Kunst	Expired	2011-05-02 09:42:18	2011-05-02 09:41:42
Nancita	Nancy	Prada	Purchasing		2011-05-02 10:38:48
kitty123	mike	mahaffey	Expired	2011-05-02 14:37:05	2011-05-02 14:36:36
Janefraser79	Jane	Fraser	Expired	2011-05-02 14:56:28	2011-05-02 14:54:32
Marioga	Mario	GallardO	Expired		2011-05-02 15:37:02
wsbrimhall	William	Brimhall	Purchasing		2011-05-02 15:40:26
Something	Jose	Pleitez	Active	2011-05-02 15:55:46	2011-05-02 15:54:41
teslin	Franklin	Burch	Active	2011-05-02 16:26:07	2011-05-02 16:24:59

Rows: 38301 to 38325 of 38325 Page 1533 of 153

Figure 1-7: 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's edit profile page, which provides all of the user's account information.

1.3.2 Find User

If a customer forgets their login information, or wants to update their profile, this page allows administrators to quickly search for that user's account.

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.

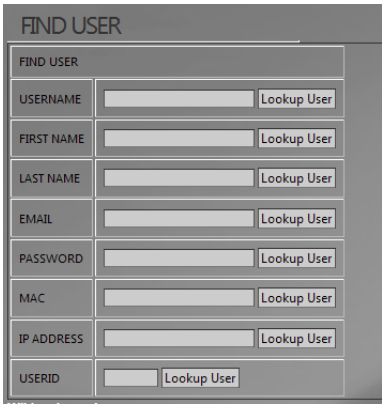


Figure 1-8: Find User

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

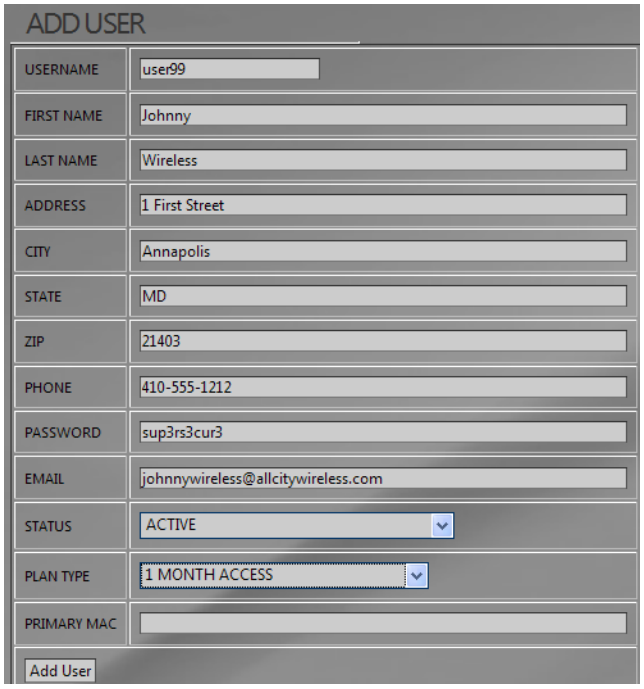


Figure 1-9: Add User

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 login without administrator help.
Expired	The user's plan has expired and the user will be asked to select or 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, then 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.

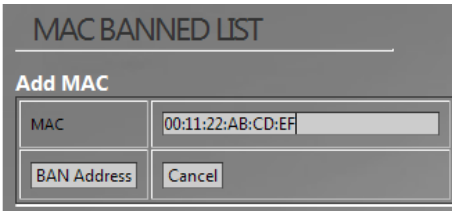


Figure 1-10: Banning a MAC from the network

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

1.3.5 Viewing User Details

When on the *Active Users* page, or the *Find Users* page, click on an individual user to bring up their details. The user details screen, which is shown in Figure 1-11, shows the registration information for the user. From that page the user's information can be updated, or their status can be changed to expired to mark their account as inactive. Update any of that information and click the **Update User Information** button to update the user's account information.

It is important to use the **Change User Plan** option when activating a user's account. Simply changing the user's status to be active on the top part of the form does not update the user's registration date. If an account was previously automatically expired, and the administrator simply changes their status to be active again, then the user's account will be automatically expired again. If the user is on a recurring plan then this action could cause the user's credit card to be charged again. To activate a user you should select the new plan and click the **Update Plan** button. This action will update the user's registration date to be the current time.

The bottom of the page gives additional operations that can be performed on the user. Click the **Delete This User** link to delete the user from the database. That option may not be available if the user has an active recurring subscription. In that case a **Delete Payment Profile** option will also be available to remove that user's payment profile. To view the user's connection history click the **View Connection History** link. The user can be disconnected by pressing the **Disconnect** link.

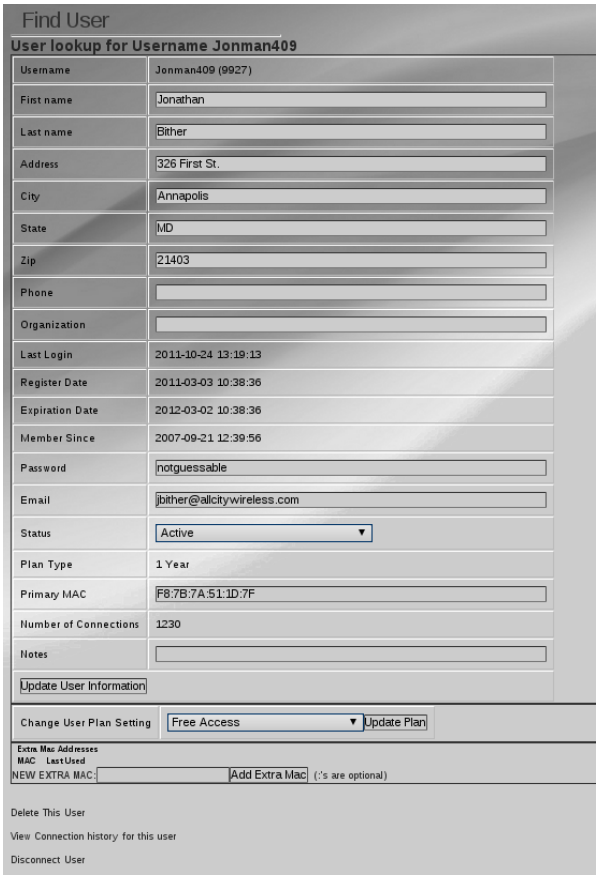


Figure 1-11: View User Details

1.3.6 View User's Connection History

From the user details screen you can click the **View Connection History** link to view a user's connection history. By default the page shows the user's connections for the past 7 days. The connection history page shows when the user was connected, how much data they transferred, and which client they were connected on.

Figure 1-12: View User's Connection History

1.4 User Experience Menu

1.4.1 Preferences

The P**references** page, shown in Figure 1-13, 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 configuration might work for attendees at a conference to see the day's events, an apartment community to see the rules and regulations, or even expose end users to a splash page of advertisements.

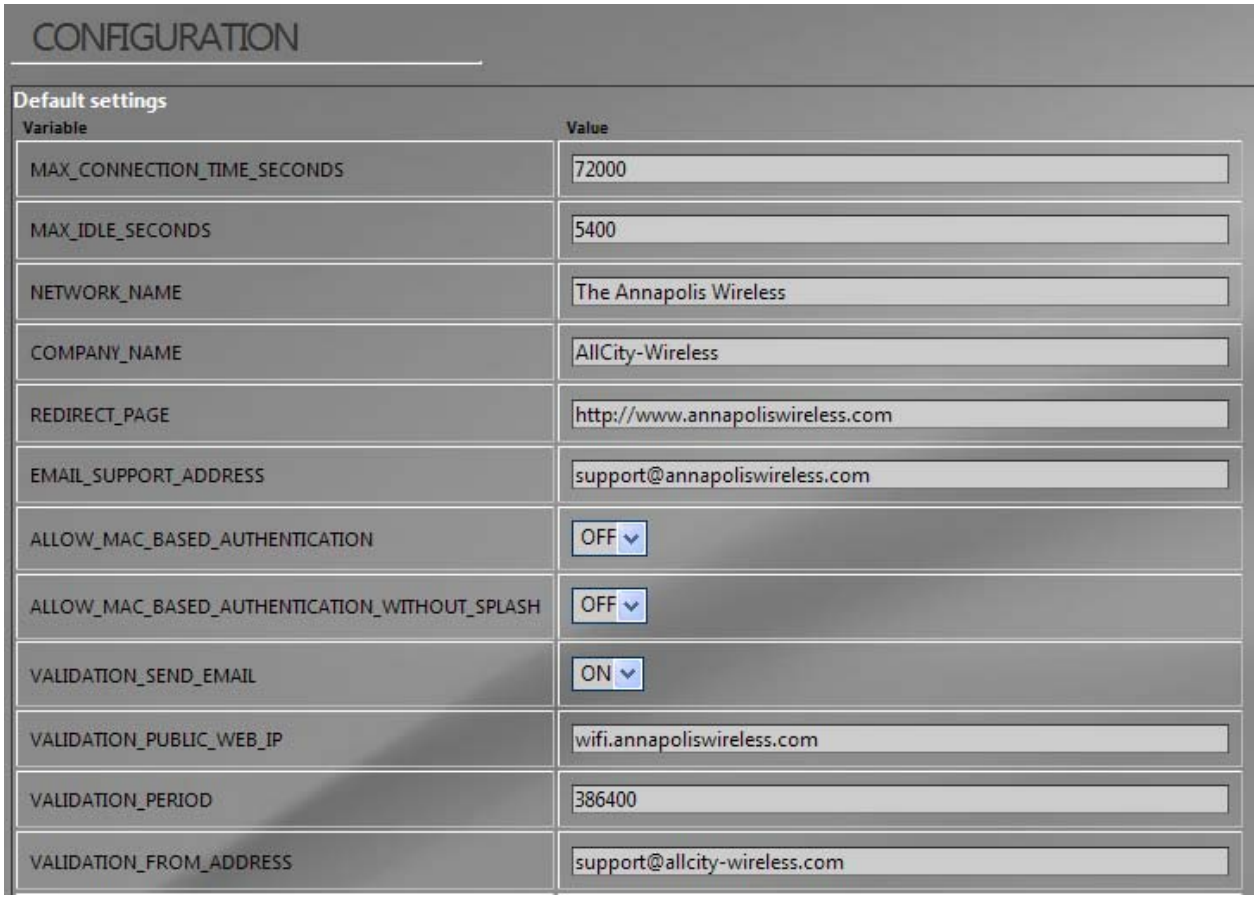


Figure 1-13: Preferences

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

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

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

MAX_CONNECTION_TIME_SECONDS	The maximum connection time, in seconds, before a user is

	disconnected and needs to login again. This setting is useful for advertisement 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. Once idle for this many seconds, they are disconnected from the WiDirect.
NETWORK_NAME	Name of the network. It is displayed in the login page, the terms and conditions on the registration page, and where ever the %NETWORK_NAME% variable is used on the branding pages.
COMPANY_NAME	Name of the ISP. It is used in the branding wherever the %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	This setting allows the user to bypass entering a username and password on the login page. The user must still start their browser to be 'logged' into the system. The firewall must be properly configured in order for a user's MAC address to be determined automatically.
ALLOW_MAC_BASED_AUTHENTICATION_WITHOUT_SPLASH	This setting allows users to be authenticated via radius and DHCP 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 setting to work properly, the **ALLOW_MAC_BASED_AUTHENTICATION** option 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 a welcome 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 the email the user is asked to click on a URL at this domain to validate their account. This setting 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 customer's who request this feature. If this feature is enabled by AllCity Wireless Support, 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_PERIOD setting, this option 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 set to yes, the "Forgot Password?" link will be removed from the login page. This setting is a security parameter that can be used at the administrator's discretion.
ALLOW_REGISTER	Set this value to no to hide the link on the login page for users to create an account.
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** **PHONE_ASK** **PHONE_REQUIRED** **PHONE_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. If the CAPTCHA is enabled the user will be asked to enter the text from an image on the registration page. The text of the terms and conditions can be edited in the profile 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 content (e.g., community website) that can be integrated into the captive portal-landing page. For example, administrators might want their users to be able 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 feature allows for the user to browse not only that web site, but also all the sites linked 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.

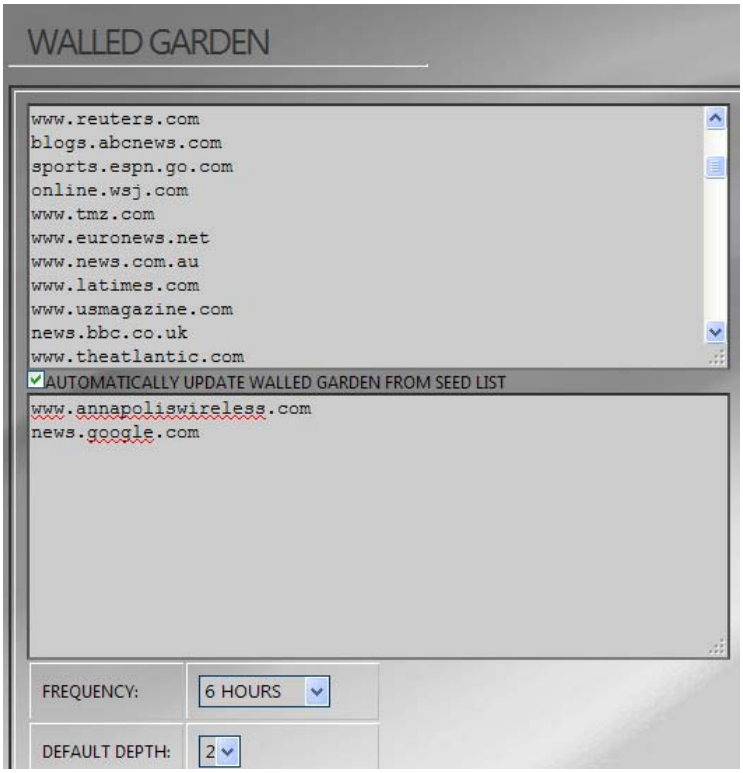


Figure 1-14: Walled Garden

1.4.3 Blocked Sites

The WiDirect has a ***Blocked Sites*** page for the administrator to specify a list of sites that users should be restricted from accessing. Simply add the list of blocked domains, one per line, to the list and click the **Update** button when done. Updating the list of blocked sites will cause a service outage of about 30 seconds.
You can also use that form to upload a list of sites to be blocked from a text file. The text file should be a plain text file, with one domain per line.
Note: Content filtering is not available by default on the Micro WiDirect or Micro WiClient. Use of firewall rules or a DNS filtering service is encouraged for content filtering on these devices.

1.4.4 Message of the Day

The ***Message of the Day*** *(MOTD)* feature allows administrators to create a message that appears 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.

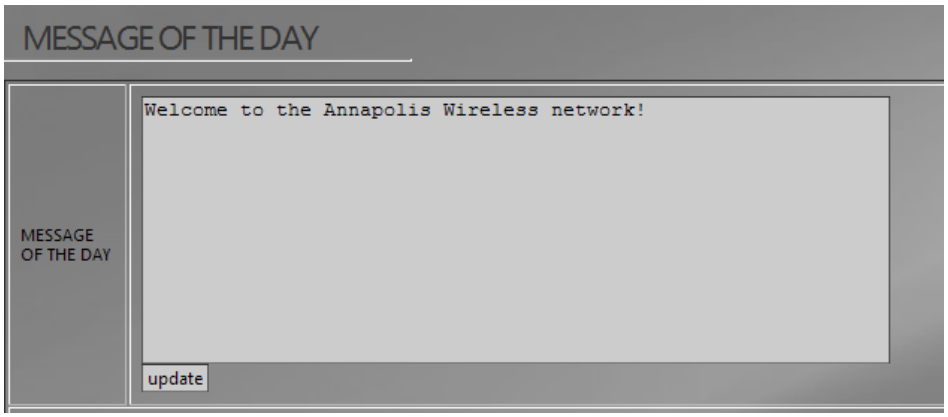


Figure 1-15: Message of the Day

The entire MOTD field can accept HTML code. However, only hyperlinks, <font>, <p>, and
 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.

1.4.5 Profile 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.

Figure 1-16: Sample Login Page

To customize these Authentication pages, click on *Profile Branding* link under the *User Experience* menu. From here, select which Profile 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.

Figure 1-17: Profile Branding Selection

When a profile is selected from the Branding Selection page, a new page is shown that lists each possible brandable page, as shown in Figure 1-18.

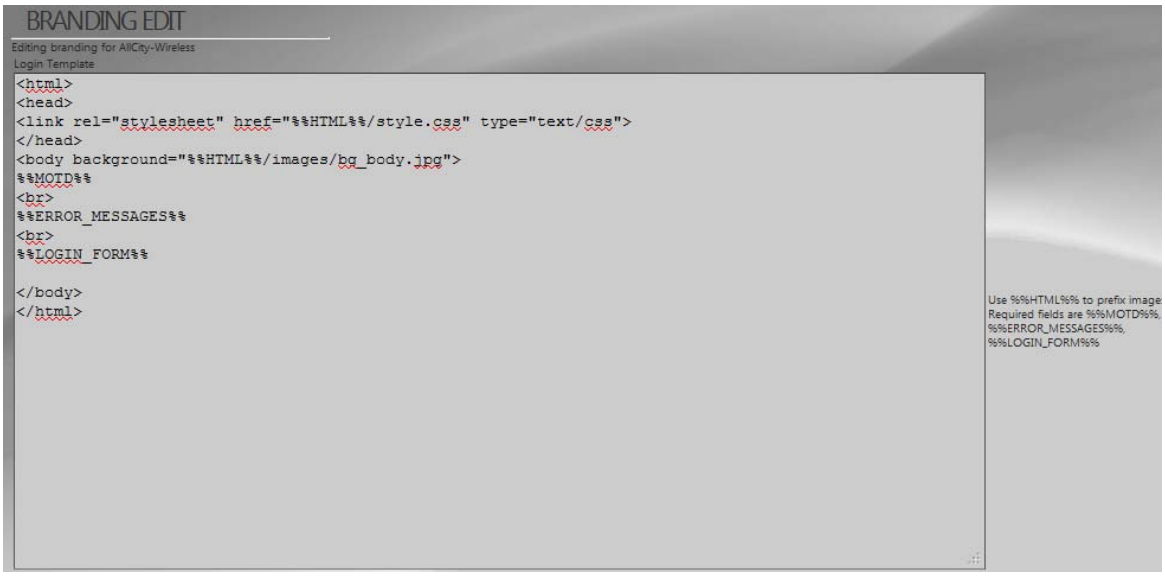


Figure 1-18: Profile Branding

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 existing 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>
```

1.4.5.1 Using Images in Branding

On the **Branding 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 for future growth. It is also important to understand usage trends, and to be able to reach out to users 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.

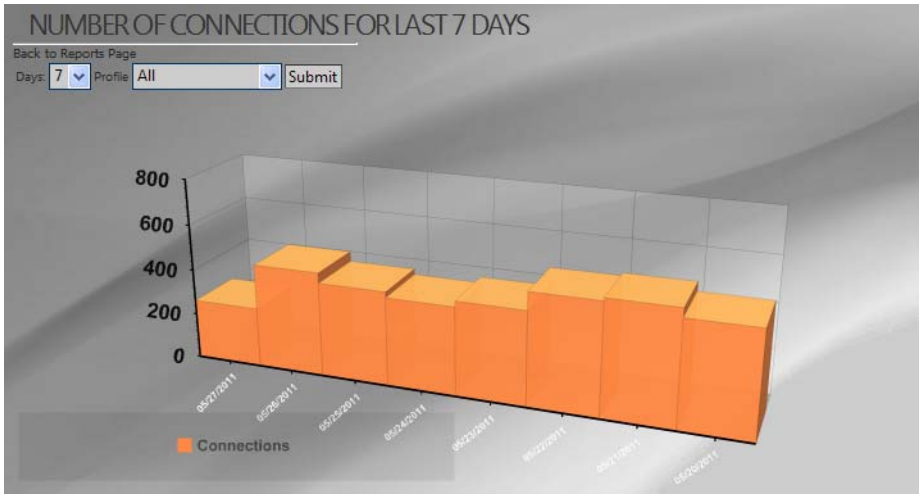


Figure 1-19: Sample Report Output

1.5.2 Connections

The connections report shows connections to a particular profile in increments of 1 to 30 days, monthly, or annually. This report 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 data 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 Profiles

To control multiple profiles, they must be defined in the **System Configuration** area of the WiDirect user management console. Once the profile 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.

Figure 1-20: Adding Profile

To edit the look and feel of a profile, 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 1-21 shows this page, which lists all the currently available plans. To create a new plan, click on the **Add Plan** link.

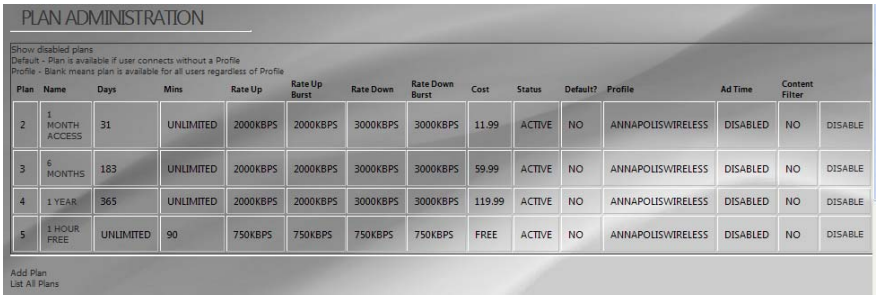


Figure 1-21: Access Plans

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 1-22.

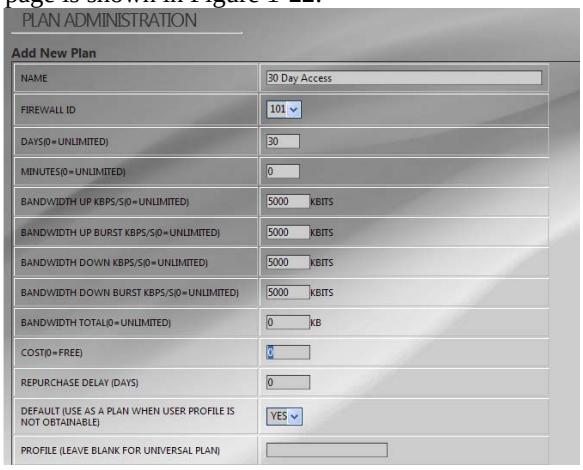


Figure 1-22: Plan Creation

If there is only one free plan defined in the system for a given profile, 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 a plan is valid for. This field may be used in addition to the days field. An access plan will only be unlimited if both the days and minutes field are blank (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 kbps upload limit but a 400 kbps burst limit, which gives users extra bandwidth if available. In most cases this value can be set 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 Down	Same as bandwidth limitation as Bandwidth Up, but for defining download speeds. 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 the user's download speeds. Measured in kbps. 1024 would equal 1 megabit (numeric field, unit

	of measure: kbps, 0= unlimited)
Bandwidth Total	The total amount of bandwidth the user is allowed in bytes. After the user exceeds this amount of data their account will be marked as expired.
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.
Recurring	This setting determines whether or not the plan should be automatically billed again after the time expires. In WiDirect Version 2.1 recurring transactions only use the Authorize.net CIM payment gateway.
Occurrences	If the access plan is set to be a recurring, then this setting determines how many times the user will be billed.
Default	If the plan is set to default and if no user profile is available or the user's profile doesn't match any plans that are configured specifically for a profile, this plan will be available to the user.
Profile	Applies this plan to a specific profile, or leave blank if the plan applies to all profiles.
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. Interstitial advertisements are not supported on the Micro WiDirect and the Micro WiClient.
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. Content filter is not supported on the Micro WiDirect and the Micro WiClient.
Login Allowed on any Profile	If this option is set to Yes, then an account created with this access plan can be used on any profile 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 profile specified in the profile field. T\his option can be used if one portion of the network allows free access, and the network administrators do not want those users to be able to login on other potions of the network.
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.
Number of Concurrent Logins	The number of times a user on this access plan is able to login at the same time. If the user signs in on more than this number of computers then all the previous sessions will be disconnected.
Permitted Times	These settings control the times that a user on an access plan are able to be connected. These fields can be left blank to allow the user to connect with no time restrictions.

Table 1-5: Plan creation fields

1.6.3 Coupons

Coupons can be used as a method to give users access to the network. Each coupon has a description, code, and plan associated with it. The plan associated with the coupon is the access plan the user will be placed on after he or she uses the coupon. The code is what the user enters to activate their account. The description is just used to help categorize the coupons. Multiple coupons with the same coupon code can be added, but the description and access plans also have to be identical. If a coupon is added once then it can be used once. If it is added multiple times then it can be used however many times it was added. Before coupons can be used the coupon payment gateway must be added on the payment gateways screen.

1.6.4 Access Points

On the ***System Configuration->Access Points*** menu, this page allows administrators to list all the access points and bridges configured on 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 1-23.

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, the WiDirect helps the administrator build Radius files based off the serial number of the Access Point. With other models of access points, such as the EnGenius ECB3500 and ECB9500, adding the access points allows the WiDirect to remotely configure the devices.

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**, the **Access Point Edit** page will be displayed as shown in Figure 1-24. 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 for any access points that are connected directly to the WiDirect.
Type	Sets the device type. Choices: Nortel, Proxim, Tropos, BelAir, EnGenius, Bridge, Other. Some access points have an automatic configuration option as well. If that option is chosen the WiDirect will automatically configure the access point. If the type is set to Bridge then the device will be displayed on the **Bridge Status** page, otherwise it will be displayed on the **AP Status** page.
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. For Nortel access points, the serial number is required to generate the keys in the radius file. For EnGenius access points this setting is used for automatic configuration. **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 a device is 'disabled', then 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

Figure 1-23: Access Points

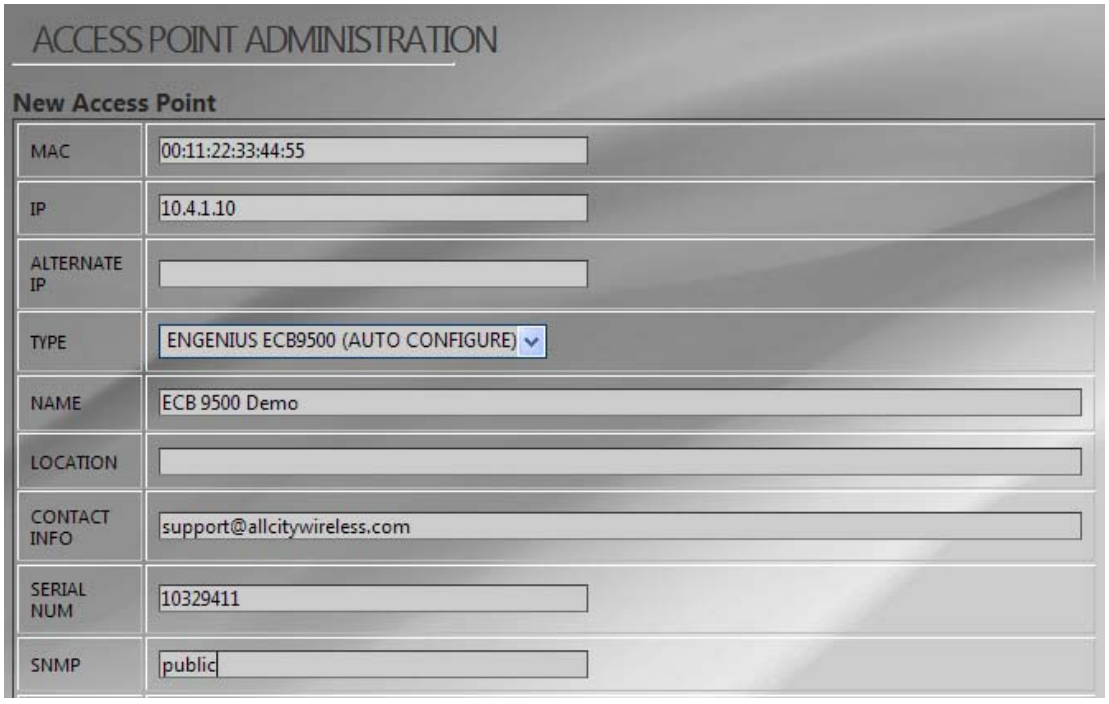


Figure 1-24: Adding a New Access Point

1.6.5 WiClients and WCMS

Each WiClient controls geographically separated networks over the Internet using WCMS. All user management is handled by the central WiDirect Auth server, but the WiClient handles the process of redirecting the user to the central WiDirect when he or she first connects to the network. After a user is authenticated all their traffic goes straight from the WiClient to the Internet. If one WiClient goes down, only the people connected to that network are affected.

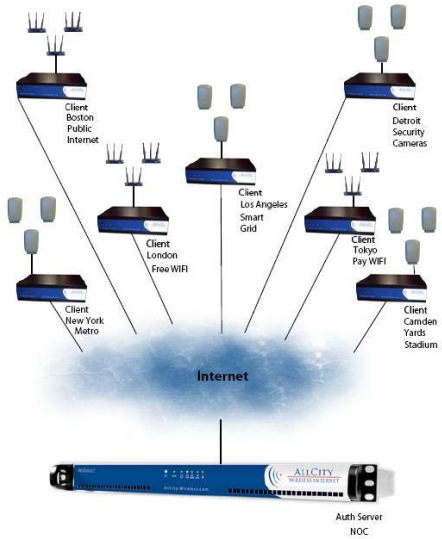


Figure 1-25: Example WiDirect Network

Figure 1-25 shows an example of a network with a WiDirect and WiClients 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 wireless networks. To the user, all the WiDirect networks appear to be under a single entity.

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

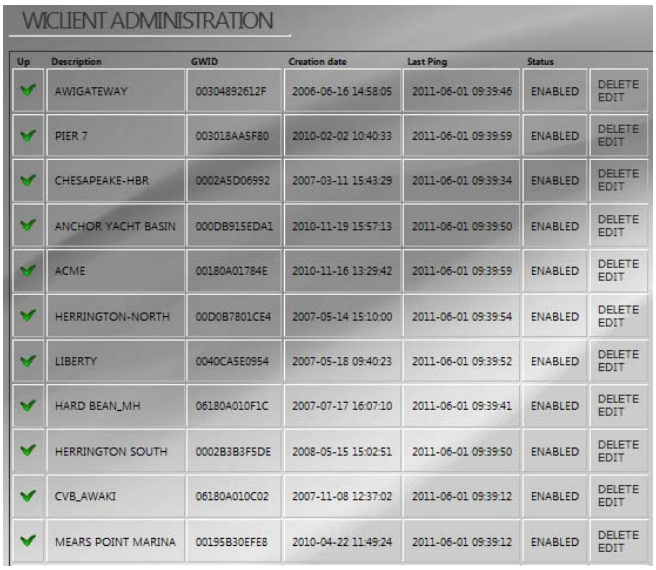


Figure 1-26: WiDirect Clients Page

1.6.6 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.

Figure 1-27: Payment Gateways

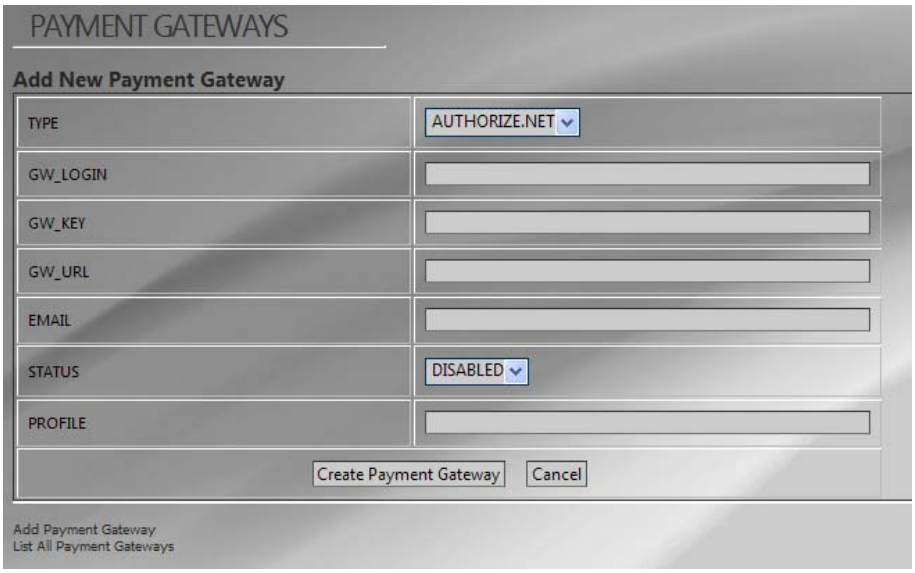


Figure 1-28: Adding Payment Gateway

From this page, first select the type of payment gateway desired, which is a drop down list next to the **Type** slot. Fill in the rest of the information, and click the **Create Payment Gateway** button at the bottom when finished. The different payment gateways have different requirements for the fields. For example, adding a payment gateway to handle coupons only requires the type, status, and profile fields to be set properly.

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, Authorize.net CIM, or Coupons. Defines which payment gateway to use.
GW_Login	API Login ID provided by Authorize.Net For PayPal, this will be the email address of the account.
GW_Key	API login 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.
Profile	The profile that the payment plan is used. If this field is blank, the payment gateway will be available for all profiles.

Table 1-8: Fields for adding payment gateways.

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

Preferences Note:
In order for PayPal or Authorize.net payments to work properly, the VALIDATION_PUBLIC_WEB_IP on the **Preferences** page must be set to the public IP or hostname of the WiDirect. The PayPal server makes a separate return call for each transaction to this IP address to report the successful payment. For Authorize.net payments this domain is used to redirect the user to a secure site to enter his or her payment information. The WiDirect should also have an SSL certificate installed to prevent the user from getting a certificate error.

Recurring Payments with Authorize.net CIM:
The WiDirect supports recurring payments using Authorize.net CIM module. To setup recurring payments both an Authorize.net payment gateway and an Authorize.net CIM payment gateway need to be added on the WiDirect. The regular Authorize.net payment gateway should be set to be disabled so that it does not appear on the purchase screen. It will be used internally for single one-time payments. If using recurring billing there must be only one Authorize.net payment gateway added, and one Authorize.net CIM payment gateway.

1.6.7 Network Configuration

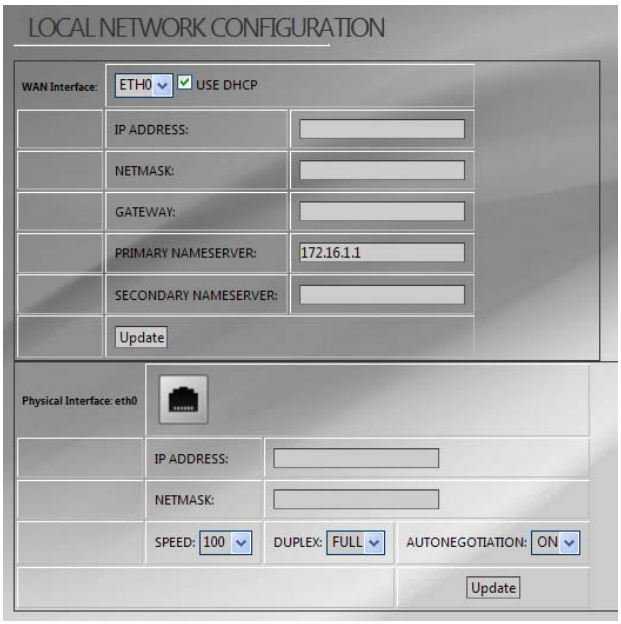


Figure 1-27: Network Configuration

Accurate IP address configuration 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, and the ETH1 interface uses the standard 10.4.1.1 addressing scheme. IP addresses are not set by default 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.

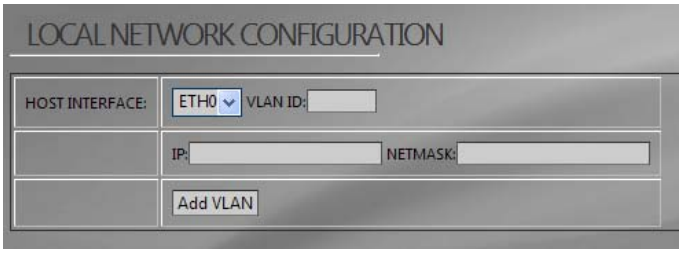


Figure 1-28: Create VLAN Interface

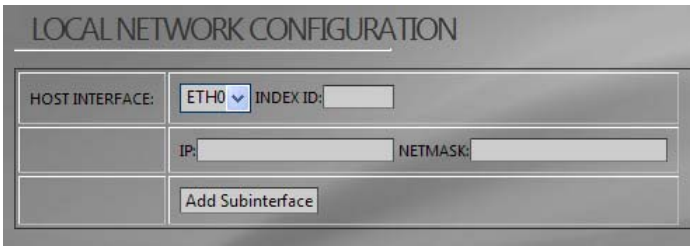


Figure 1-29: Create Subinterface

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.

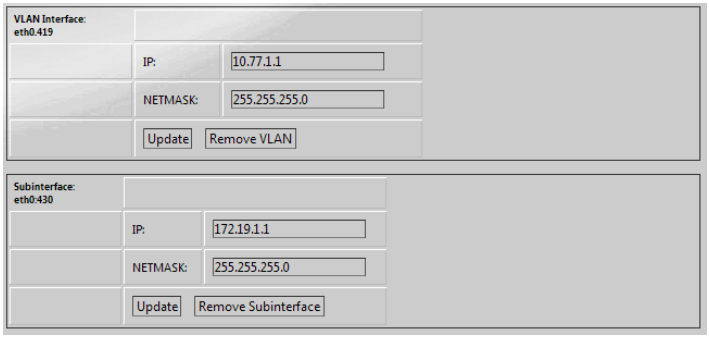


Figure 1-30: Network Configuration Page

1.6.8 Network Routing

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

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.

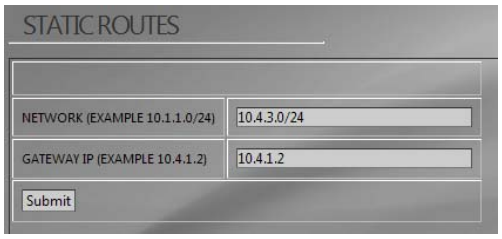


Figure 1-31: Network Routing Page

1.6.9 Date and Time

To modify the time settings 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. When making major changes to the time, or when changing the time zone, it is a good idea to restart the WiDirect. Refer to section 2 for a description of how to restart all system services without restarting the WiDirect.

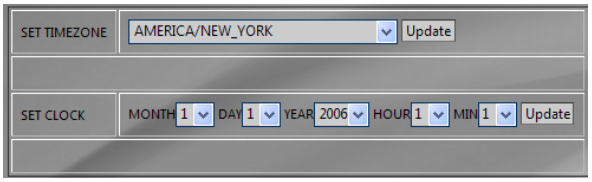


Figure 1-32: Date and Time

1.6.10 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. The purpose of each log file is described in Table 1-9.

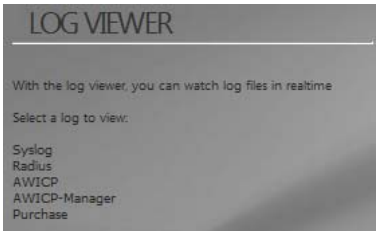


Figure 1-33: Log Viewer

Log File	Description
Syslog	This log file contains various system messages that can be helpful for troubleshooting problems. The log will contain a record of system events in case the WiDirect locks up. This file will also contain a record of DHCP requests, which can be helpful for troubleshooting a user who is having connection problems. When making changes to the DHCP configuration this log file can be helpful for identifying the source of any errors.
Radius	The Radius log file will contain a record of Radius messages that have been processed by the WiDirect.
AWICP	The AWICP log file is a record of log entries made by the captive portal. The log will contain a record of user logins and registrations, and may also include information if a user is having trouble signing on.

AWICP-Manager	The AWICP-Manager log file contains a record of users who are disconnected or have had their accounts expired by the WiDirect. This log will contain the reason that their account was disconnected or marked as expired.
Purchases	The purchases log file contains a record of users who have purchased access plans. It includes all Authorize.net and PayPal purchases.

Table 1-9: Descriptions of Log Files

1.6.11 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. All users, including users that have been disabled or expired, 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. All WiDirects shipping with version 1.5 and above have no restrictions on the number of concurrent users.

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.

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.

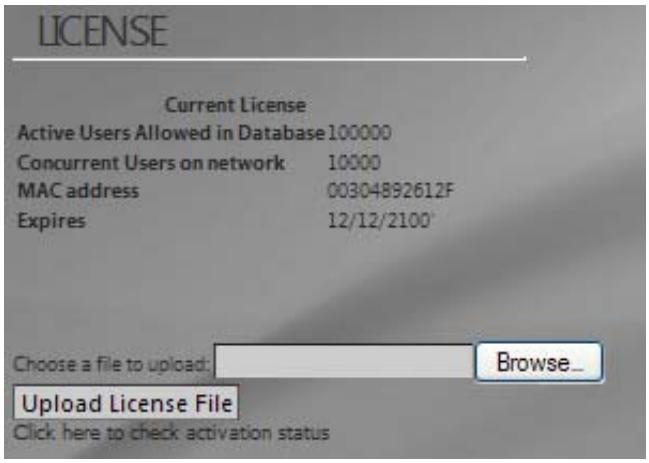


Figure 1-34: License Key

1.6.12 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.

Figure 1-35: Admin Users

1.6.12.1 Add New Administrator

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

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. If the email alerts box is checked then the administrator will get email alerts for certain events.

1.6.12.2 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.

1.6.12.3 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.

1.6.12.4 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.

1.6.13 Shutdown

The ***Shutdown*** page, which is 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.

1.6.14 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.

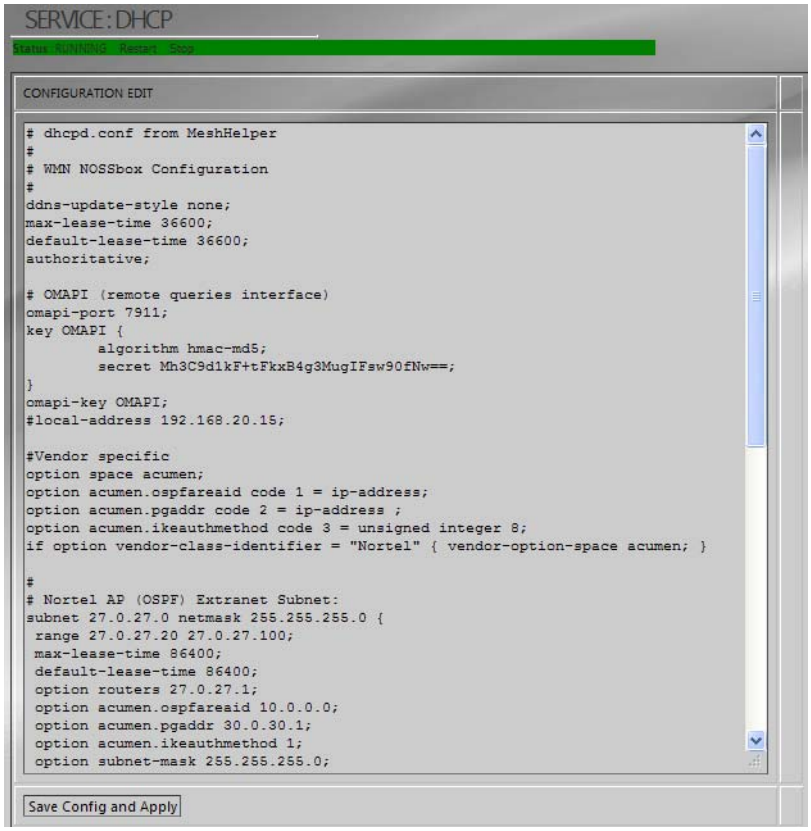


Figure 1-37: DHCP Service

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*

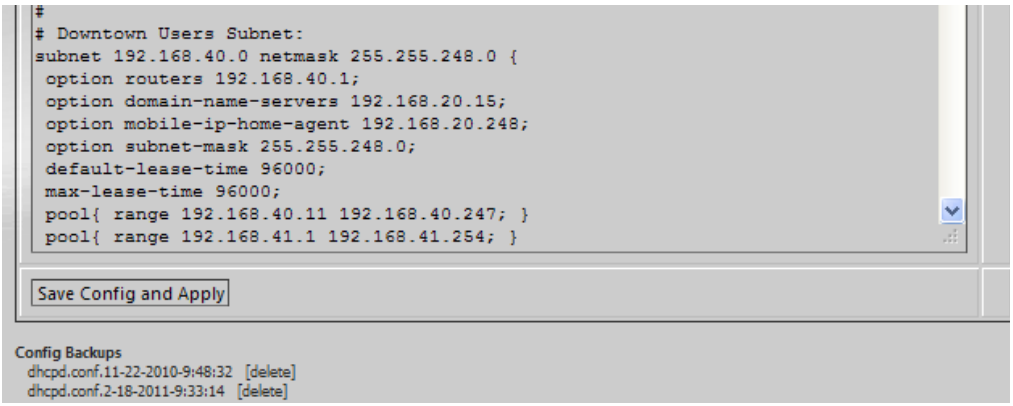


Figure 1-38: DHCP 'Save Config and Apply' Button

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.

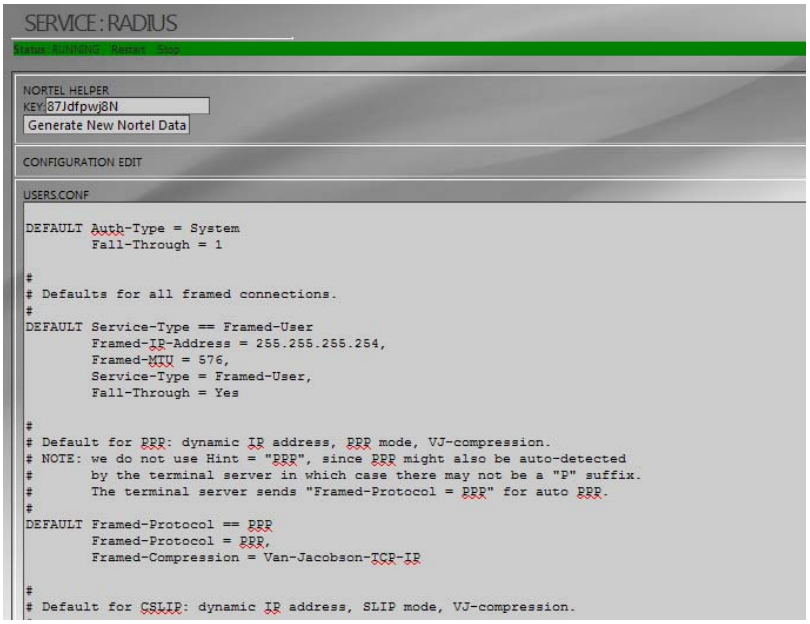


Figure 1-39: Configuring Radius

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.

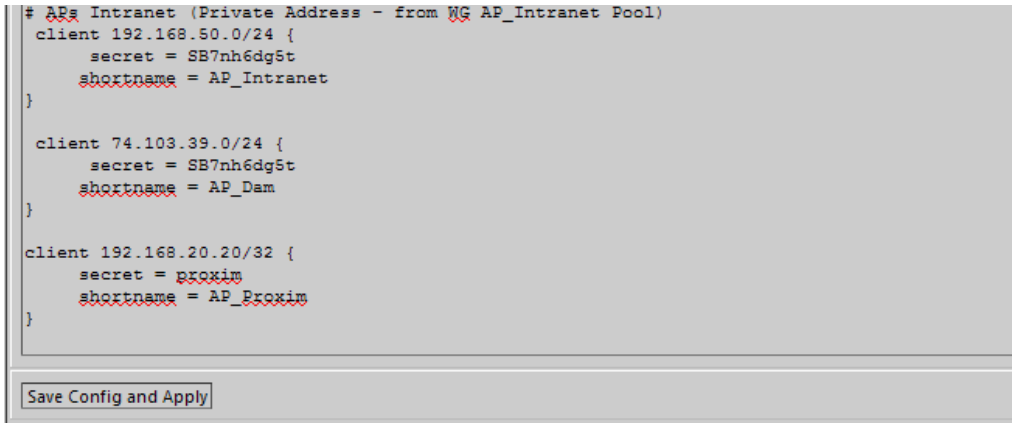


Figure 1-40: Radius Save Config and Apply

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 configure a proper SSL certificate for the WiDirect.

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.

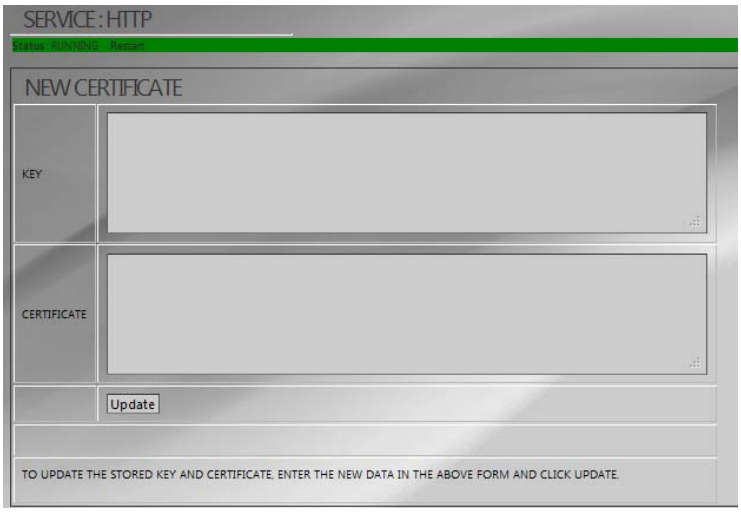


Figure 1-41: HTTP Management

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 1-10 and 1-11.

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.

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.

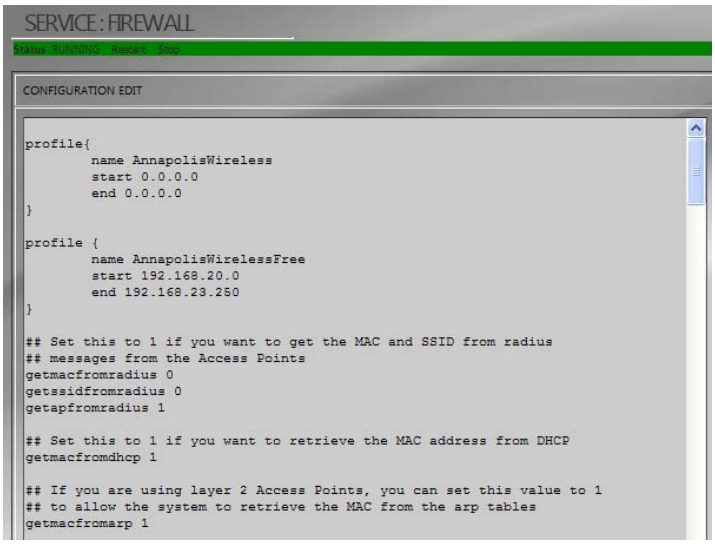


Figure 1-42: Firewall Configuration Page

1.7.4.1 Firewall Configuration Options

Table 1-10 lists many of the firewall configuration items, such as how to obtain the Profile, AP, IP, and MAC addresses of users, turning on/off web caching, and adding trusted users. The traffic filtering features are covered in the next section.

Keyword	Description

profile	Defines a profile, along with the IP address range assigned to that profile. This command saves processing time by eliminating the need to obtain the profile from Radius accounting messages, and is also available when the access point model does not support Radius messages. The default profile is set by setting the start and end IP range to 0.0.0.0. Example:
	profile {
	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 profile from the Radius Accounting messages. Should only be used if multiple profiles 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 getmacfromdhcp command. If the standard configuration is used on the WiDirect for DHCP service, these commands should not change. If another DHCPD server is required, then 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**
TrustedMACList	This command allows the administrator to enter a list of trusted MAC addresses. These devices will be allowed direct Internet access without any restrictions.
preproxy	Preproxy must be enabled to use the walled garden or landing page feature. Set preproxy to 0 to disable these features.
applesupport	Set this value to 1 to have Apple mobile devices, such as the iPhone and iPad, automatically display the login page when the device connects to the WiFi

	network. If the device doesn't login then it will automatically disconnect from the network.
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. Set this value to 0 to disable the web proxy for all users. Set this value to 1 to enable the web proxy for all users. Setting this value to 2 will enable the web proxy only for users on an access plan with content filtering or interstitial advertisements enabled.
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 1-10: 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 1-11 describes each portion of this command in detail.

FirewallRule	Mandatory. Tells the WiDirect that the rule is a firewall rule.
action	Describes the behavior of the line. It can be set as 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. A domain is allowed here as well. If the domain points to multiple IPs, only the first IP address found will be used.
/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 1-11: 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 page 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.

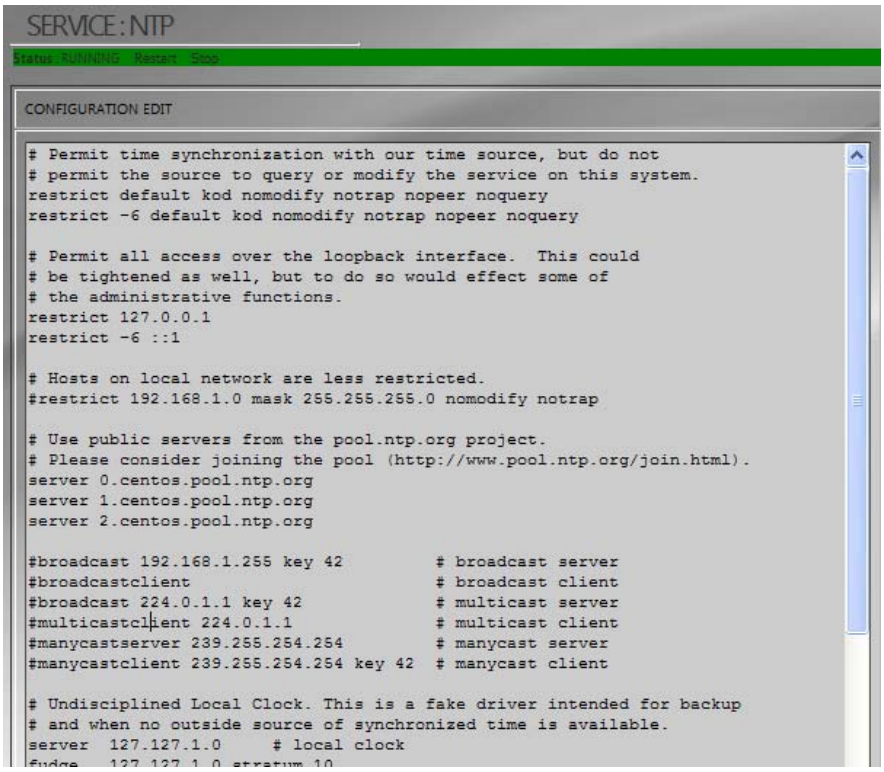


Figure 1-43: NTPD Configuration

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. In a large network, or if a lot of users are going to use the walled garden functionality, it is a good idea to increase the number of Preproxy processes.

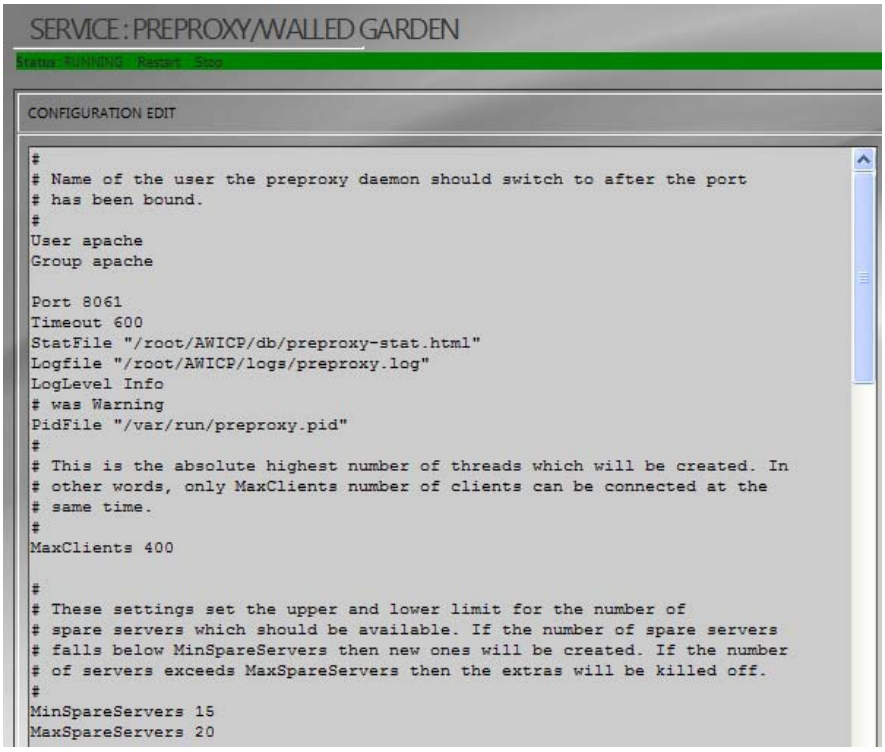


Figure 1-44: Preproxy Configuration

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.

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.

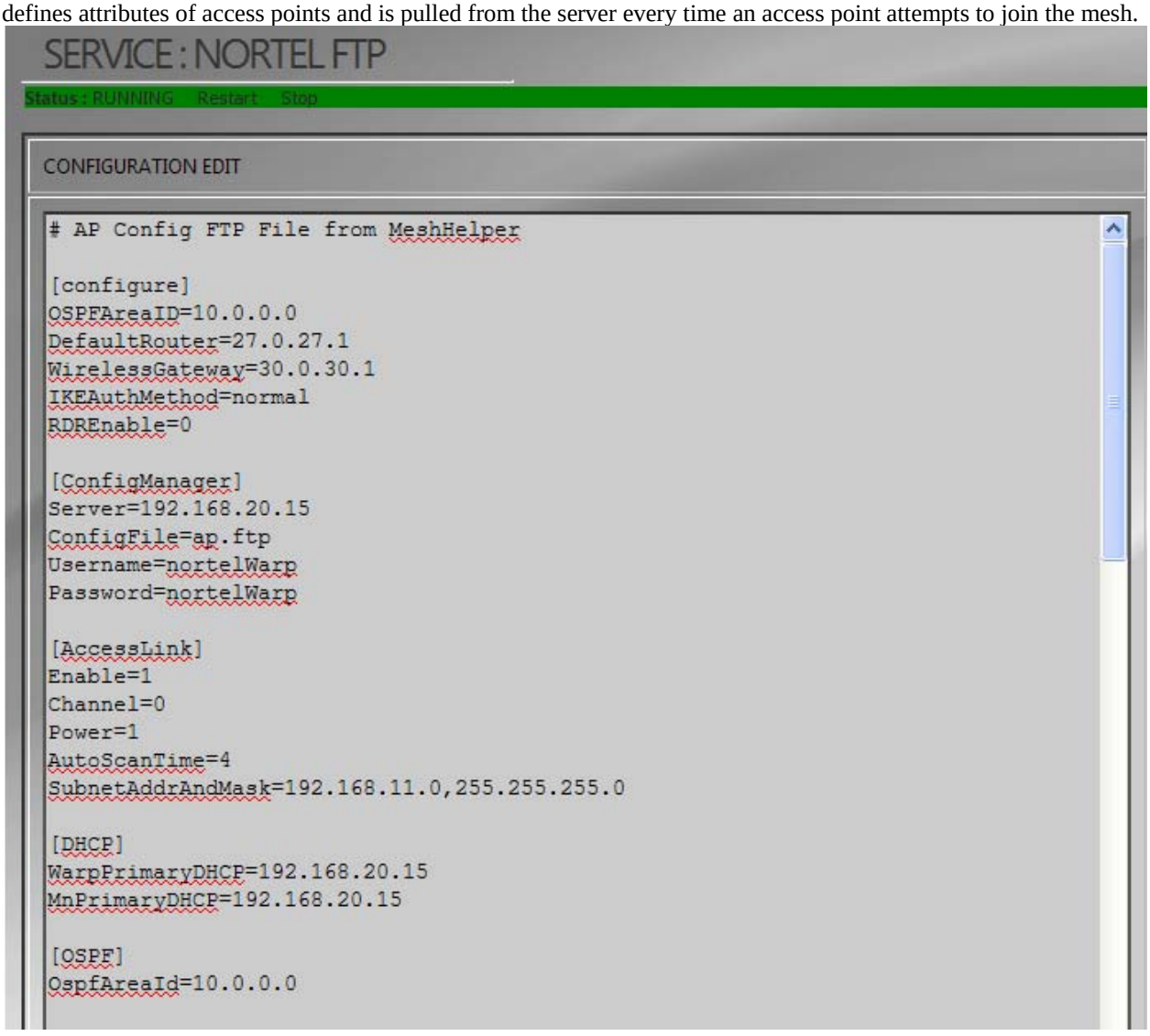


Figure 1-46: FTP Configuration

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 Nortel 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.

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 **EnGenius 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 its IP address and other settings will be updated. A message will be reported in the **Event Viewer** when an access point is reconfigured.

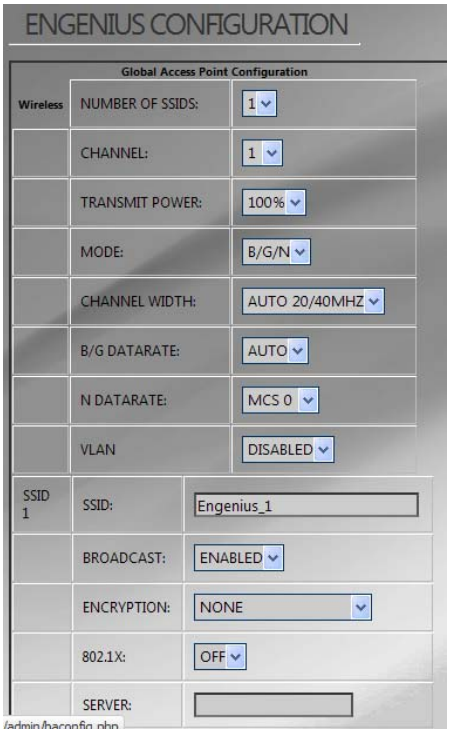


Figure 1-48: EnGenius Configuration

The EnGenius configuration page is pictured above in Figure 1-48. Most settings are global and will be set the same for each access point. At the bottom of the configuration page there are some settings that can be set for individual access points.

1.8.3 BelAir

1.8.3.1 Access Point Configuration

The **BelAir 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 addresses 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 the administrator 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.

Figure 1-50: AP and Radio Selection

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.

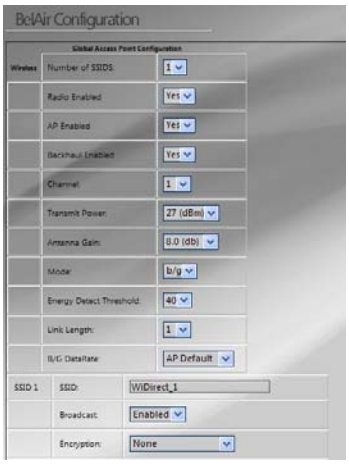


Figure 1-51: BelAir Configuration Page

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***. Then type in a domain name to query, for example 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 interface 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. The account **awisupport** is also available for SSH logins. If this is a new system, the password will be **widirect**. Since command line access gives full control over the WiDirect, including the ability to look up passwords to the web GUI, it is important that a secure password be set.

Once connected, administrators are free to use any of the standard Unix commands to navigate the system. To perform any advanced configuration changes 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 Restarting System Services

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
sudo /sbin/service dhcpd restart

The process of stopping and starting will take about 45 seconds. When changing the time zone some additional services need to be restarted in addition to the ones mentioned above:

sudo /sbin/service mysqld restart
sudo /sbin/service httpd restart

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

2.5 Generate SSL Key and Certificate

It is important to generate a new SSL key and certificate when accepting payments using Authorize.net. To generate an SSL key, run this command:

sudo openssl genrsa –out localhost.key 2048

To create a self signed certificate, run this command:

sudo openssl req -new -x509 -nodes -sha1 -days 365 -key localhost.key > localhost.crt

Run the following command to create a certificate signing request (CSR) for a third part to generate a key:

openssl req -new -key localhost.key -out localhost.csr

View the contents of those files with these commands:

cat localhost.key
cat localhost.crt
cat localhost.csr

The entire contents of the key and certificate files, including the lines that start with hyphens, can be put on the certificate page on the WiDirect to update the certificate.

2.6 Using Emacs to Edit Files

Emacs is a command line text editor that can be used to view and edit various files on the WiDirect. The following command can be used to view the system log:

sudo emacs /var/log/messages

Once the editing window is open you can scroll through with the arrow keys on the keyboard. At anytime you can exit by pressing Control-X, followed by Control-C.

2.7 Configure Port Forwarding

Run this command to modify the internal firewall to configure port forwarding rules:

sudo emacs /etc/sysconfig/iptables

Look for the portion of the file containing the existing NAT rules. You may have to scroll down with the arrow and page down keys. The NAT rules should look like this:
**nat*
:OUTPUT ACCEPT [401:23400]
:POSTROUTING ACCEPT [375:21730]
:PREROUTING ACCEPT [144:12599]
-A POSTROUTING -o eth0 -j MASQUERADE

Add the port forwarding rule. To forward traffic on port 8080 to the local IP 10.4.1.2 on port 80, you would use this rule:
-A PREROUTING -p tcp -d x.x.x.x --dport 8080 -j DNAT --to-destination 10.4.1.2:80

Replace x.x.x.x with the eth0 IP for the local WiDirect or WiClient. When finished editing the file, exit Emacs by pressing Control-X, followed by Control-C. Restart the firewall and client by running these commands:

sudo /sbin/service iptables restart
sudo /sbin/service awicp_client restart

Go to the Firewall page in the GUI and add the IP address to the TrustedIPList. If the IP address is not in the trusted list then the device won't be able to communicate with the internet unless it is logged in.

2.8 Using Tcpdump to Monitor Traffic

A utility called tcpdump is available for monitoring network traffic. This utility is useful for diagnosing connection problems, or for monitoring activity on a network interface. This command can monitor traffic for a single user, or for all traffic on an interface. To exit out of tcpdump at anytime press Control-C. Table 2-1 shows some common tcpdump commands.

Monitor all traffic on eth1 for all users	sudo /usr/sbin/tcpdump -ieth1
Monitor traffic on eth1 for IP 10.4.1.20	sudo /usr/sbin/tcpdump -ieth1 host 10.4.1.20
Monitor traffic on eth1 for MAC 00:11:22:33:44:55	sudo /usr/sbin/tcpdump -ieth1 ether host 00:11:22:33:44:55
Monitor DNS requests on eth1	sudo /usr/sbin/tcpdump -ieth1 port 53
Monitor DHCP requests on eth1	sudo /usr/sbin/tcpdump -ieth1 port 67

Table 2-1: Common tcpdump commands

Note: Instead of typing "*sudo /usr/sbin/tcpdump*" on the above commands, run the "*su* -" command first to get root access. Then run the tcpdump utility by typing "*tcpdump*".

2.9 Using Arping to Test a User's Connection

A common method to test a user's connection is to ping their computer. Many computers have pings blocked by default, so this method isn't always helpful. An alternative method is available, called arping, sends an ARP requests which cannot be blocked on the user's computer. ARP requests won't go through a router though, so to use arping the computer must be on the same Ethernet subnet as the WiDirect. To run the arping command the IP address and interface must be specified. This command will ping the IP 10.4.1.20 on the interface eth1:

sudo /usr/sbin/arping 10.4.1.20 -I eth1

The arping command will show the MAC address of the device with the specified IP address. When finished press Control-C to exit.

2.10 Access SQL database

The WiDirect uses a MySQL database to store configuration information. It is not recommended that you make changes to the database, but it can be helpful to access for certain tasks. To access the database, run this command from the SSH session:

mysql –uportal –pannamysql portal

To exit the MySQL client application at any time press Control-C. The following sections will describe how to perform some basic operations on the database.

2.10.1 Reset failed login attempts

The WiDirect administration pages will block an IP address from logging in after three failed login attempts. If you are getting the error saying you need to wait 15 minutes to login then you can reset the failed attempt counter by running the following command in the MySQL client utility:

delete from AdminLoginAttempts;

2.10.2 Recover GUI Administrator Password

The MySQL client utility can be used to recover a lost administrator password. Run this command to view a list of administrator usernames and passwords:

select username,AES_Decrypt(password, "109a134e99.1900.1800-12a") from admin_users;

2.10.3 Delete Expired Users

You can delete a large group of expired users at one time from the MySQL database. These steps will show how to delete all expired users who have not logged in for six months. Before making changes it is important to backup the database. Run this command to do a backup of the database from the SSH command line:

mysqldump -uportal -pannamysql portal >backupFileName

Open the database following the instructions from above, and run these five commands:

delete from connections where userid in (select userid from users where (status = 3 or status = 4) and lastlogin< date_sub(now(), interval 6 month));
delete from extra_user_macs where userid in (select userid from users where (status = 3 or status = 4) and lastlogin < date_sub(now(), interval 6 month));

delete from emailverify where userid in (select userid from users where (status = 3 or status = 4) and lastlogin < date_sub(now(), interval 6 month));
delete from tokens where userid in (select userid from users where (status = 3 or status = 4) and lastlogin < date_sub(now(), interval 6 month));
delete from users where (status = 3 or status = 4) and lastlogin < date_sub(now(), interval 6 month);

If any major mistakes are made when running the above commands, then running this command from the SSH session will restore the MySQL database:

mysql -uportal -pannamysql portal < backupFileName

2.11 More Information

The WiDirect and WiClient models run on the operating system CentOS. Documentation is available on the CentOS web site www.centos.org that gives a detailed overview of all the capabilities of the WiDirect product.

3 Installation

3.1 Support Services

Support Contact Details
Dedicated Phone Support: +1-443-294-0000
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 access plans available with different restrictions. Users on the public network will also have an option to enter a code in for faster access. 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

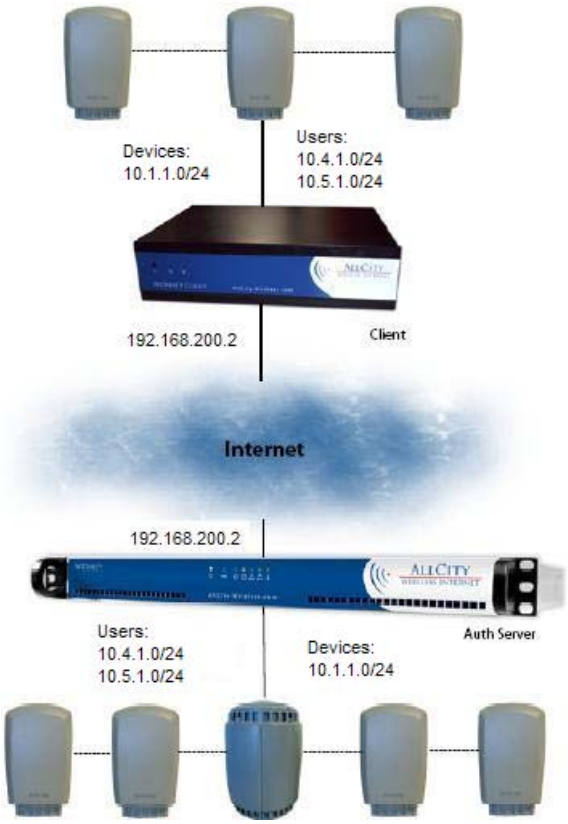


Figure 3-1: Sample Network Diagram

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. The WiDirect should be restarted when changing the IP address of the ETH1 interface.

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:

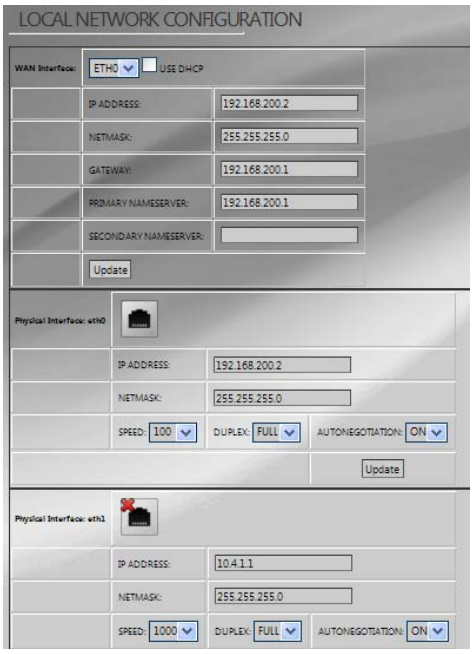


Figure 3-2: Setting up the Network

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.

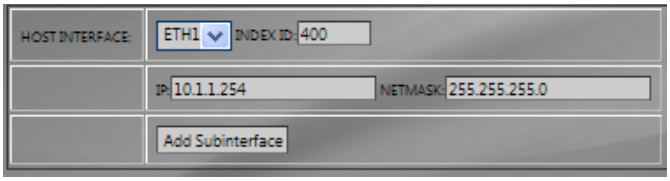


Figure 3-3: Adding Subinterface

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.

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.

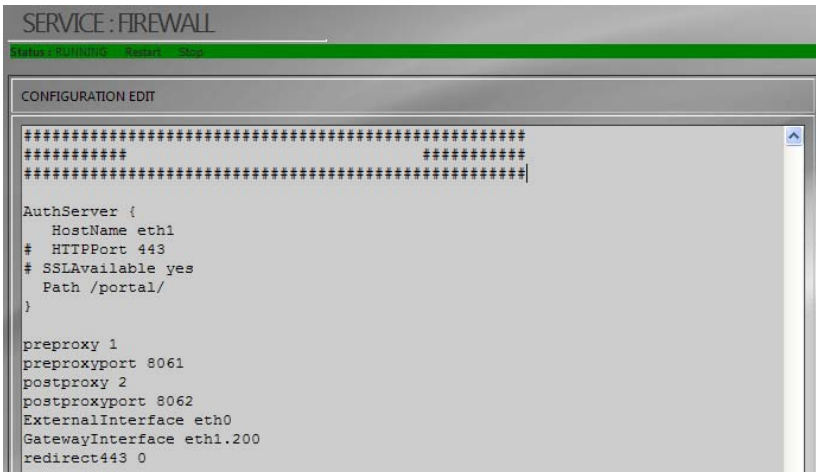


Figure 3-5: Add Gateway Interface

3.2.1.3 Configuring WiClient

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 or IP address of the main WiDirect server.

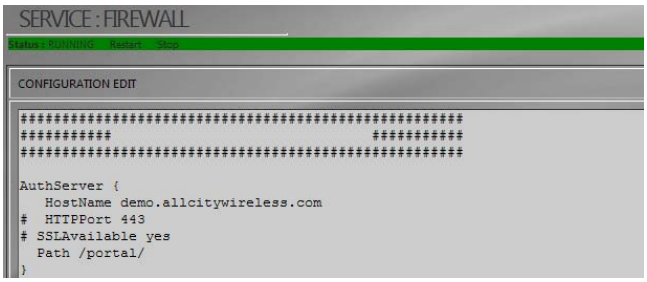


Figure 3-6: Configure Client with Auth Server Information

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.

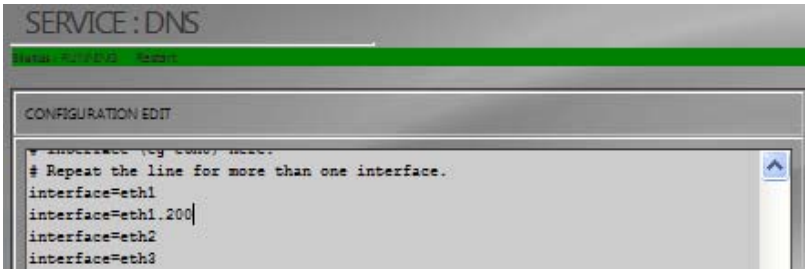


Figure 3-7: Configure DNS Server

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.

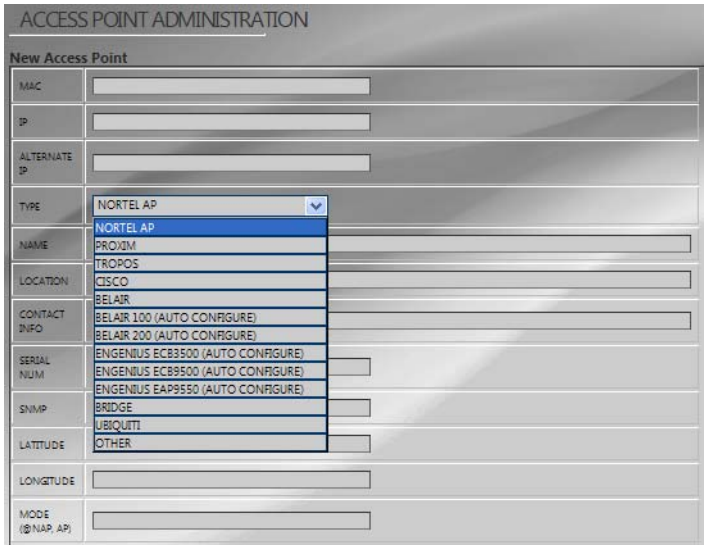


Figure 3-8: Adding Access Point

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	
00:00:00:00:00:01	10.1.1.10	BELAIR	NAP	BA100		SUPPORT@ALLCITYWIRELESS.COM		ENABLED		WED JUN 1 10:43:34 2011	DELETE
00:00:00:00:00:02	10.1.1.11	BELAIR	SAP1	BA101		SUPPORT@ALLCITYWIRELESS.COM		ENABLED		WED JUN 1 10:43:28 2011	DELETE
00:00:00:00:00:03	10.1.1.12	BELAIR	SAP2	BA103		SUPPORT@ALLCITYWIRELESS.COM		ENABLED		WED JUN 1 10:43:23 2011	DELETE
00:00:00:00:00:04	10.1.1.13	BELAIR	SAP3	BA104		SUPPORT@ALLCITYWIRELESS.COM		ENABLED		WED JUN 1 10:43:17 2011	DELETE
00:00:00:00:00:05	10.1.1.14	BELAIR	SAP4	BA105		SUPPORT@ALLCITYWIRELESS.COM		ENABLED		WED JUN 1 10:44:32 2011	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 Profile

The WiDirect still needs to know about the profile for branding and reporting purposes. By clicking on ***System Configuration->Profiles***, the profile can be added as in Figure 3-10. For this example there are going to be two profiles:

Figure 3-10: Profile Creation

Rules also have to be created in the firewall to determine which users belong in which profile. 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 profile, and the 10.5.1.0/24 subnet will be on the BusinessUsers profile. A default profile will also be created as an example. Figure 3-11 shows the configuration file with the profile settings applied.

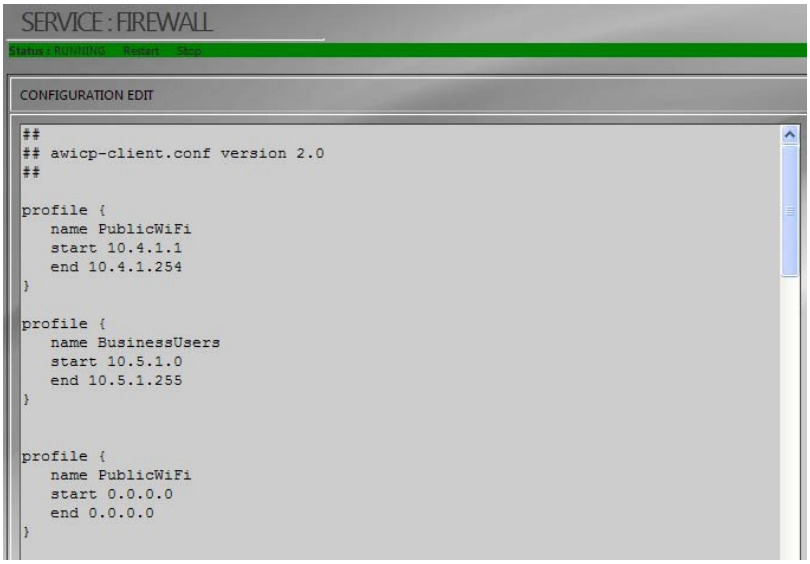


Figure 3-11: Create profiles in Firewall

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 profile, the profile field should be set properly, and the Default option should be set to No. These settings will make sure that the access plans are only displayed to users on the proper profile.

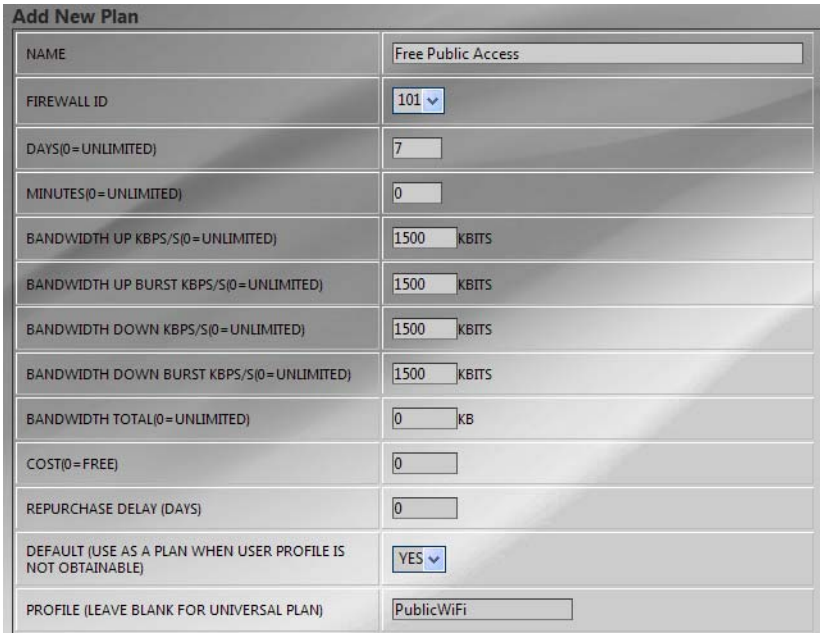


Figure 3-12: Creating the Public Access Plan

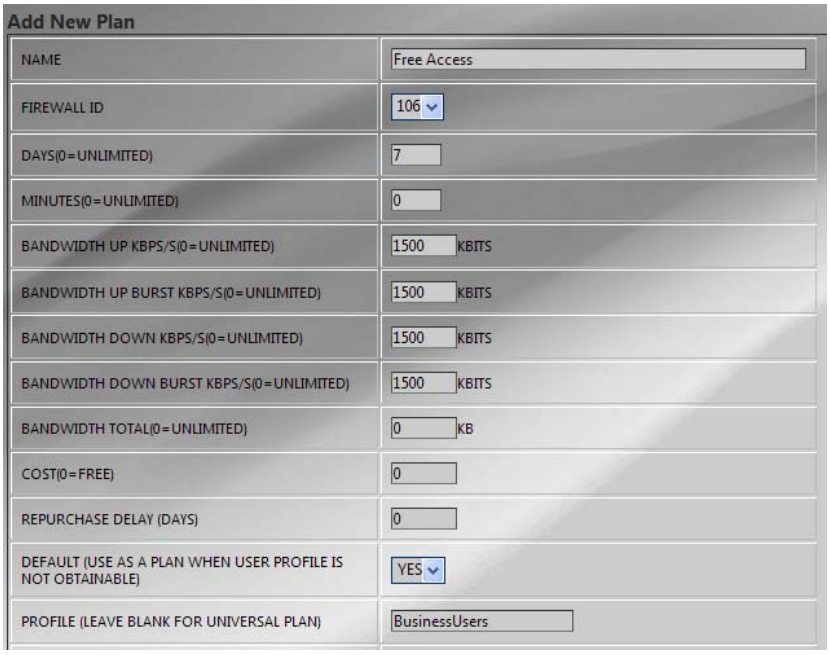


Figure 3-13: Creating the Business Access Plan

3.2.1.9 Create Coupons and Payment Gateway

In this scenario users on the public WiFi network are going to have the option to enter a code for faster access. Any user who knows the code “FastAccess” will be able to enter this code when activating their account to be put on the faster plan. First create this coupon on the coupon page. The description will be “Public High Speed WiFi Access,” the plan will be the public high speed plan previously created, and the token will be “FastAccess.” This coupon can be added multiple times so that it can be given to multiple users.

The payment gateway must also be created so that the user is presented with the option to enter a coupon. On the payment gateways screen add a payment gateway with the type coupon, and the profile name “PublicWiFi.”

3.2.1.10 Create Administrators

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

3.2.1.11 Setting Profile Preferences

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

3.2.1.12 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.

3.2.1.13 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

3.2.1.14 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 the message of the day.

3.2.1.15 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.

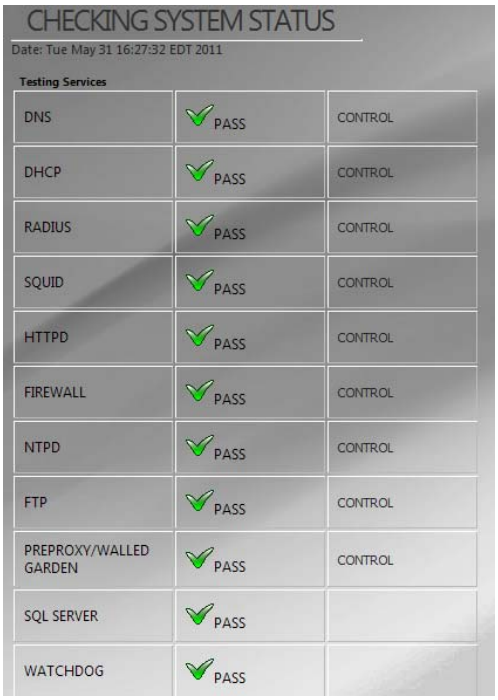


Figure 3-14 Running the System Check

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 wireless network**.** 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 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->DHCP**), 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, the camera is named "camera2," but any name would have been acceptable as long as the name is unique among all the entries in the DHCP configuration 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 will be allowed internet access without being restricted by the captive portal.

4.2 Customizing a Network by Profile

The WiDirect allows you to customize the user's interface and access plan choices based on where they are located in the network. This is done by creating multiple profiles on the network. Users can be placed on a profile based on their IP address or which WiClient they are connected on.

4.2.1 Configure the User’s Profile

The easiest way to separate the users on multiple profiles is to put them in different IP ranges. With multiple VLANS available users in one VLAN can be placed in one IP address subnet, and users in another VLAN will be in a different subnet. Those subnets can then be placed in different profiles. If there are multiple WiClients in the network then the WiClients can all share a profile, or each WiClient can be on its own profile.
To see the default profile that users are placed on when connecting can be seen in the firewall configuration file. To view the firewall configuration file, click on **Services->Firewall** in the WiDirect or WiClient's menu. The following shows the default configuration for a profile to apply to users who are not assigned a profile anywhere else:

```
profile {
name AnnapolisWireless
start 0.0.0.0
end 0.0.0.0
}
```

You can specify a different range to put people from a different subnet into a different profile:

```
profile {
name Baltimore-Wireless
start 10.8.1.0
end 10.8.1.254
}
```

If your access points are supported then you can use get the user's profile from the access point using RADIUS by changing the getssidfromradius value to be 1 in the firewall configuration file.

4.2.2 Branding

To change the branding for the profiles you will need to first click on the **System Configuration->Profiles** menu item. From the profiles page you can aAfter a profile is added you can change the branding by clicking on the **Profile Branding** menu option.

4.2.3 Access Plans

Users can be given a different choice of access plan based on which profile they are in. When creating an access plan, specify the profile in the profile field to show that access to users registering on that profile. Also the default option must be set to no if the plan should not be displayed to all users. If the default option on the plan page is enabled, then the plan will be shows to users on all profiles. The access plan may also be marked as restricted which allows them to only sign in on that profile.

4.3 Configuring VLANs

Configuring VLANs requires changes in a number of different places. First the VLANs need to be created on the network configuration page. Then the DHCP and DNS server must be properly configured to handle those VLANs. Finally the firewall must be configured to require that traffic to be authenticated.

4.3.1 Create VLAN

The bottom of the Network Configuration page has buttons to add a VLAN interface. 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.

4.3.2 Configure DNS and DHCP Servers

The DNS and DHCP servers both should be configured to handle the VLAN interface. The DNS server will ignore DNS requests unless the interface has been specified in the configuration file. The DHCP server needs to be properly configured to give out IP addresses for the VLAN subnet.

4.3.3 Configure Firewall

By default the firewall will only redirect traffic to the captive portal on the eth1 interface. To force users on the VLAN interface to authenticate with the WiDirect the firewall needs to be told to listen on the VLAN interface.

4.4 Setup Recurring Billing with Authorize.net CIM

This section explains how to configure a WiDirect to automatically charge a user's credit card when their account is due to renew. Configuring recurring billing requires careful configuration of the payment gateways so that the payments are processed properly. Setting up recurring billing also requires

4.4.1 Payment Gateways

You need to add both an Authorize.net payment gateway, and an Authorize.net CIM payment gateway. The regular Authorize.net payment gateway should have the URL "https://secure.authorize.net/gateway/transact.dll" and the status should be set to disabled. The status is disabled because it won't show up on the payment option list by default, but it still may be used internally if a user signs up for a non-recurring plan and chooses not to save their credit card information. The login and key should be set to the API login and key provided by Authorize.net.
The Authorize.net CIM payment gateway should be added on the payment gateway page with the URL "https://api.authorize.net/xml/v1/request.api" and the status should be active. There should be no other Authorize.net payment gateways created.

4.4.2 Access Plans

To make an access plan bill automatically set the "Recurring" option to "Yes" and the number of occurrences to be the number of times that the plan will bill. Use a large number for the occurrences to make it bill indefinitely.

4.4.3 User Details

Users who have an active Authorize.net profile will have that information listed on their user details page. That profile must be removed before the user can be deleted.

4.4.4 Branding

There are branding options for the successful and failed payment e-mails. These are currently only pulled from the "default" profile, so will need to add a profile called "default" to edit them. The payment e-mails will come from the address specified on "EMAIL_SUPPORT_ADDRESS" option on the preferences page,. The payment emails will also CC to that address. Emails are only sent for automatic payments, not initial payments.
You can also edit the branding of the account edit page. The account edit page is where a user can update their account or credit card information. You will want to link to this page from the failed payment e-mail so they can update their information if their card is declined.

4.4.5 Failed Payments

If a user has an active profile with Authorize.net and their card is declined the failed payment e-mail will be sent. The user will have an opportunity to update their account information. There will be additional attempts made 24 and 48 hours later. If the payment is still denied on the 3rd attempt then the account will be expired.

4.4.6 Activating Accounts

If there is an old expired account that still has a payment profile with Authorize.net, simply changing the status to be "Active" will bill the user again. Changing a user's status to Active does not change their registration date. A user on a regular plan would be automatically expired again. A user on a recurring plan will be billed again.
The proper way to reactivate a user with a new registration date is to use the **Change User Plan** option at the bottom of the user details page. This will mark the account active, and will prevent an immediate attempt to expire/charge the account again.

4.4.7 Making a Payment

When signing up for a recurring plan the user is of course forced to save their credit card information. If they are making a one time payment they have the option of either saving their credit card information or not saving it. If the user does choose to save their credit card information then the next time they renew they have the option of using their old credit card.

4.4.8 Update Account

Users can edit their credit card information by going to https://www.widirectdomain.com/update. It would be helpful to give links to this page from the login page and failed payment e-mails so users know how to update their credit card information. This is only used for accounts that are active on a recurring plan.

4.5 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.

4.6 Hiding Access Plans from Users

Hidden access plans can be created that are not displayed to users. If a profile is set on an access plan to an unused profile, and the default option is set to no, then the access plan won't be displayed to users.

Figure 4-1: Creating a hidden access plan

4.7 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 4.6 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.

4.8 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.

4.9 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.

After making those changes run these two commands for the changes to take effect:
sudo /sbin/service iptables restart
sudo /sbin/service awicp_client restart

4.10 Enable Ping on WAN Interface

By default the WiDirect does not respond to pings on the WAN interface. To enable pings you need to modify the iptables configuration file on the WiDirect.

SSH to the WiDirect and run the following command:

sudo vi /etc/sysconfig/iptables

Use the arrow keys to find this line:

-A INPUT -i eth0 -j REJECT --reject-with icmp-port-unreachable

Above that line add a new line that looks like this:

-A INPUT -i eth0 -p icmp --icmp-type 8 -s 0/0 -m state --state NEW,ESTABLISHED,RELATED -j ACCEPT

Save the changes and exit the vi text editor. Then run these two commands for the changes to take effect:

sudo /sbin/service iptables restart
sudo /sbin/service awicp_client restart

4.11 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.

4.12 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.

4.13 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

4.13.1 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

4.13.2 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)
DS**smtp.companyxyz.com**

4.13.3 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

4.14 Hosted WiDirect

The Hosted WiDirect service is available to allow network operators to quickly deploy a wireless network without purchasing a WiDirect. A WiClient is placed at each location and is told to point back to the data center hosted by AllCity Wireless.

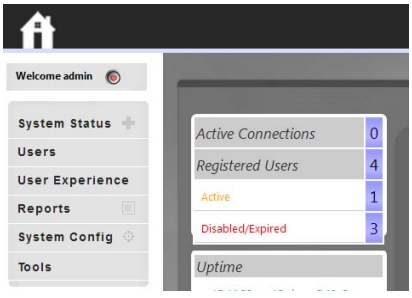


Figure 5-3: Hosted WiDirect Menu

The GUI on the Hosted WiDirect is very similar to a regular WiDirect, but several features are removed from the interface as they are not required. The **Services** menu is removed since all the services run on the WiClient. Likewise the pages to add and configure access points are not on the Hosted WiDirect.

4.15 Disable Proceed Page When Using MAC Authentication

When MAC based authentication is used, the users will be brought to a splash page asking them to hit a button before connecting to the network. The purpose of this page is to give the user a consistent experience, and to avoid the problems when the user tries to login too many times simultaneously.
If you plan to disable the proceed page then the first thing you need to do is to open the **Access Plan** page and increase the number of concurrent logins allowed for each access plan. The default value is one, and you will want to increase that to a higher number, such as 15.
The next step is to modify the login page to automatically bypass this screen. From an SSH session, run the following command:

sudo emacs /root/AWICP/www/portal/login/index.php

Scroll down to find this line:

$displayLoginMacAuth = 1;

On that line change the 1 to a 0, and exit by pressing Control-X followed by Control-C. After making the above changes users will no longer see the proceed page. The users will still have to open a web browser before accessing the internet.

4.16 Automatically Logout Dead Connections

Sometimes a user's connection data counters will report no traffic even though the user has been on for a while. While these connections are not a problem, it makes the active users page look better to have these extra connections removed. There is a setting to log these connections out quicker than the idle timer if that is desired. Run this command from the command line:

sudo emacs /root/AWICP/bin/awicp_manager.pl

Look for a line that says "my $MAX_DEAD_SECONDS = 0;" Change the 0 to the number of seconds a connection with 0 data should be allowed to stay open.

4.17 Increased Customization of Login Page

The WiDirect includes some of the login page branding directly in the login page PHP files by default to make branding easier. To get full control over the look and feel of the login page, this extra branding code can be removed. To remove this extra code open the login page PHP file with this command:

sudo emacs /root/AWICP/www/portal/login/index.php

Scroll down to find this line:

$showLoginText = 1;

On that line change the 1 to a 0, and then exit the emacs text editor. The next step will be to modify the login template. The following code will display the default login template when the regular login branding is disabled:

<html>
<head>

```
<link rel="stylesheet" href="/portal/branding//default//style.css" type="text/css">
</head>
<body background="/portal/branding//default//images/bg_body.jpg">
<br>
<br>
<div id="ctr" align="center"> <div class="login"> <div class="login-form"> <img
src="/portal/images/login.gif" alt="Login">
<div class="form-block">
%%LOGIN_FORM%%
</div>
</div>
<div class="login-text">
<p>Welcome to Network Network</p>
<p>Please enter a valid username and password to access the system.</p>
<br><h3>Need an account?</h3>
<a href="/portal/register/?ssid=%%PROFILE%%&mac=%%MAC%%&ap=%%AP%%&url=%%URL%%">Click
here to register</a></h3>
</p></div>
<div class="clr"></div><p><A
href="/portal/forgot/?ssid=%%PROFILE%%&mac=%%MAC%%&ap=%%AP%%&url=%%URL%%">Forgot
Password?</A></p><p><A
href="/portal/changepassword/?ssid=%%PROFILE%%&mac=%%MAC%%&ap=%%AP%%">Change
Password</A></p> </div>
</div>
</div>
</body>
</html>
```

4.18 Enable SNMP Monitoring of the WiDirect

SNMP monitoring is available on the WiDirect to help the administrator monitor functions of the device. The following commands will install and enable the SNMP server.

yum install net-snmp.i386
service snmpd start
chkconfig snmp on

That will give you basic SNMP information. The SNMP port must be opened on the WiDirect as well. Run this command to edit the firewall:

emacs /etc/sysconfig/iptables

To open the SNMP port add this line:

-A INPUT -p udp -m udp --dport 161 -j ACCEPT

That line must be added before this line:

-A INPUT -i eth0 -j REJECT --reject-with icmp-port-unreachable

Save and exit the file. Restart the necessary processes with these commands:

service iptables restart
service awicp_client restart

The SNMP configuration may be edited by changing the /etc/snmp/snmpd.conf file. When making changes to the SNMP configuration file restart the SNMP service with this command:

service snmpd restart

4.19 Automatic Login on Multiple Devices

Normally MAC based authentication only works for the last device to login on account. If the user logs in with a second computer, then only the second computer will automatically login the next time. An administrator can manually add a MAC address to be automatically authenticated on the user details page. There is a section at the user details page to add an extra MAC address to an account for automatic login.
The WiDirect can also be customized to automatically add MAC addresses to an account when a user connects. Run this command on the WiDirect to change that setting:

sudo emacs /root/AWICP/www/portal/login/index.php

Look for a line that says "$autoAddMac = 0;" and change it to read "$autoAddMac = 1;". The WiDirect can be configured to automatically delete extra MAC addresses when an account expires. To have the WiDirect automatically delete the MAC addresses of expiring accounts first run this command:

sudo emacs /root/AWICP/bin/awicp_manager.pl

In that file look for a line that contains "$deleteExtraMacsOnExpire = 0" and change the 0 to a 1. Then run this command to restart the service:

sudo /sbin/service awicp_manager restart

To automatically delete the MAC addresses when an administrator expires an account, run this command:

sudo emacs /root/AWICP/www/portal/admin/user.php

In that file look for the same "$deleteExtraMacsOnExpire = 0" part and change the 0 to a 1.

4.20 Account MAC Restrictions

In some scenarios it may be beneficial to limit the number of devices that are allowed to be associated with an account. By default additional connections will simply disconnect the previous connections. The WiDirect allows the administrator to restrict an account to a certain number of MAC addresses. If the user attempts to login with additional devices then the login attempt will be denied. To edit this setting first run this command:

sudo emacs /root/AWICP/www/portal/login/index.php

In that file look for the option "$restrictMAC = 0". The first option should be set to the number of MAC addresses each account is allowed to use. The second option is the number of days back to check, or 0 to use their last activation date.

4.21 Enable Refunds

Refunds are disabled by default on the WiDirect. When refunds are enabled payments can be refunded from the purchase history page. To enable refunds run this command from an SSH session:

sudo emacs /root/AWICP/www/portal/admin/purchase_history.php

Once that file is open edit the line “$enableRefund=0” by changing the 0 to a 1. After that change any administrator will be able to refund Authorize.net payments.

4.22 Failed Login Reports

Failed login reports are available to log failed connection attempts. To enable failed login logs first run this command:

sudo emacs /root/AWICP/www/portal/login/index.php

In that file look for the line that says “$logLoginFailures = 0” and change the 0 to a 1. Making that change will enable the logging of invalid usernames and passwords, which is available on the reports page.

4.23 Creating Profile Specific User and Administrator Accounts

One option on a WiDirect network is to permanently associate a user account with a profile. Instead of a regular username the username will contain “@Profile Name” at the end of it. This functionality allows for additional usage reports, and for profile specific administrators. A profile administrator is only able to view users and make customizations for their profile. The table below outlines the changes that need to be made for this functionality.

File	Change From	Change To	Notes
/root/AWICP/www/ /register/index.php	$profileInUsername=0	$profileInUsername=1	Forces the username to include the profile in the suffix.
/root/AWICP/www/portal/admin/adminusers.php	$showProfileAdminOption = 0	$showProfileAdminOption = 1	Adds the profile administrator option on the admin users’ page.
/root/AWICP/www/portal/admin/reports/text.php	$showMoreReports = 0;	$showMoreReports = 1;	Shows additional usage reports broken down by profile.
/root/AWICP/bin/awicp_manager.pl	$logActiveUsers = 0;	$logActiveUsers = 1;	Enables the creation of reports for active user counts per profile.
/root/AWICP/www/portal/classes/Common.php	$hideDeletedUsers = 0;	$hideDeletedUsers = 1;	Hides deleted users instead of displaying them. Enables accurate active user history logs.

4.24 Multiple WiDirect Hot Standby

In some scenarios it may be advisable to have multiple WiDirect units running side by side in the event that one fails. In the unlikely event that a WiDirect fails, the other one will perform all the WiDirect functions.
Many of the steps below will require root access to the WiDirect. This command can be run initially to obtain root access:

su -

4.24.1 Overview

Setting up multiple WiDirects for failover is complicated, but provides benefits in the event one of the units fails. Only one WiDirect is going to be active at anytime, but the second one will have a constant backup of all the important data from the first WiDirect. If one WiDirect fails, then the other one is still able to manage the network.

Each of the WiDirects is going to have a local IP address on the eth0 and eth1 interfaces. The WiDirects are also going to have a shared IP address on each interface.

4.24.2 Configure Hostname

It is important for hostnames to be properly set on both WiDirects. Open the network file to edit the hostname by using this command:

sudo emacs /etc/sysconfig/network

After setting the hostname restart the WiDirect.

4.24.3 Install Packages

A number of packages are required to be installed to configure WiDirect failover. Run this command first:

emacs /etc/yum.repos.d/clusterlabs.repo

Add this text to the text file:

```
[clusterlabs]
name=High Availability/Clustering server technologies (epel-5)
baseurl=http://www.clusterlabs.org/rpm/epel-5
type=rpm-md
gpgcheck=0
enabled=1
```

Save the file and run these commands:

yum clean all
wget http://download.fedora.redhat.com/pub/epel/5/i386/epel-release-5-4.noarch.rpm
rpm -i epel-release-5-4.noarch.rpm
yum remove awicp_reloaders
yum install awicp_reloaders_ha drbd83 kmod-drbd83 heartbeat pacemaker*

4.24.4 Create Firewall Rules

A number of ports need to be opened for the services to work properly. TCP ports 7788 through 7799 need to be opened for the shared drive functionality to work. UDP port 694 must be opened for the process monitoring services to work. Add these lines to the top portion of the iptables file:

```
-A INPUT -i eth0 -p tcp -m tcp --dport 7788:7799 --tcp-flags SYN,RST,ACK SYN -j ACCEPT
-A INPUT -i eth0 -p udp -m udp --dport 694 -j ACCEPT
```

4.24.5 Configure Local Services

service mysqld stop
chkconfig mysqld off
service dhcpd stop
chkconfig dhcpd off
service dnsmasq stop
chkconfig dnsmasq off
service httpd stop

chkconfig httpd off
*rm -rf /etc/rc3.d/*awicp**

4.24.6 Create Shared Drive

Both WiDirects are going to share storage space for data that will be shared between them.
There is empty space available on the hard drive for the shared drive. Run these commands on both WiDirects to create the partitions:

lvm
lvcreate --size 8G -n LogVol02 VolGroup00
exit
emacs /etc/drbd.conf

Below is an example DRBD configuration file.

```
resource drbd0 {
        protocol C;
        handlers {
        split-brain "/usr/lib/drbd/notify-split-brain.sh dveasey@allcitywireless.com";
         fence-peer "/usr/lib/drbd/crm-fence-peer.sh";
         after-resync-target "/usr/lib/drbd/crm-unfence-peer.sh";
}

        startup {
                degr-wfc-timeout 120;
                wfc-timeout      120;
        }
    disk {
         on-io-error detach;
         fencing resource-only;
    }

        net {
                timeout 120;
                connect-int 20;
                ping-int 20;
                max-buffers 2048;
                max-epoch-size 2048;
                ko-count 30;
                cram-hmac-alg "sha1";
                shared-secret "MakeThisSecretSecure";
        }
        syncer {
                rate 10M;
                al-extents 257;
        }

        on f1.awi6.net {
                device /dev/drbd0;
                disk /dev/VolGroup00/LogVol02;
                address 10.8.9.123:7788;
                meta-disk internal;
        }
    on f2.awi6.net {
```

```
    device /dev/drbd0;
    disk /dev/VolGroup00/LogVol02;
    address 10.8.2.224:7788;
    meta-disk internal;
  }

}
```

After the configuration file is saved the next step is to create the drive metadata. These commands need to be run on both WiDirects:

drbdadm create-md drbd0
drbdadm up drbd0
mkdir /shared
service mysqld stop
mkdir /root/AWICP/license
chmod -R a+rw /root/AWICP/license
cp /root/AWICP/etc/awicp.serial /root/AWICP/license

After those commands have been run on both WiDirects, one WiDirect needs to be identified as the initial primary device. Run these commands to identify the primary WiDirect:

drbdsetup /dev/drbd0 primary -o
mke2fs -j /dev/drbd0
e2fsck /dev/drbd0
mount /dev/drbd0 /shared
mv /var/lib/mysql /shared/mysql
ln -s /shared/mysql /var/lib/mysql
mv /root/AWICP/www/portal/branding /shared/
ln -s /shared/branding /root/AWICP/www/portal/branding
mv /root/AWICP/etc /shared
ln -s /shared/etc /root/AWICP/etc
mv /root/AWICP/logs /shared/
ln -s /shared/logs /root/AWICP/logs
mv /root/AWICP/monitor-data /shared/
ln -s /shared/monitor-data /root/AWICP/monitor-data
mv /root/AWICP/db /shared/
ln -s /shared/db /root/AWICP/db
mv /etc/dhcpd.conf /shared/etc/dhcpd.conf
ln -s /shared/etc/dhcpd.conf /etc/dhcpd.conf
mv /var/lib/dhcpd /shared/
ln -s /shared/dhcpd /var/lib/dhcpd

One more step is required to modify the file locations on the secondary WiDirect:

mv /var/lib/mysql /var/lib/mysql.backup
ln -s /shared/mysql /var/lib/mysql
mv /root/AWICP/www/portal/branding /root/AWICP/www/portal/branding.backup
ln –s /shared/branding /root/AWICP/www/portal/branding
mv /root/AWICP/etc /root/AWICP/etc.backup
ln –s /shared/etc /root/AWICP/etc
mv /root/AWICP/logs /root/AWICP/logs.backup
ln -s /shared/logs /root/AWICP/logs
mv /root/AWICP/monitor-data /root/AWICP/monitor-data.backup
ln -s /shared/monitor-data /root/AWICP/monitor-data
mv /root/AWICP/db /root/AWICP/db.backup

ln -s /shared/db /root/AWICP/db
mv /etc/dhcpd.conf /etc/dhcpd.conf.backup
ln -s /shared/etc/dhcpd.conf /etc/dhcpd.conf
mv /var/lib/dhcpd /var/lib/dhcpd.backup
ln -s /shared/dhcpd /var/lib/dhcpd

4.24.7 Configure Services for Failover

The first step on both devices is to create the Heartbeat configuration file. Run this command to edit that file:

emacs /etc/ha.d/ha.cf

Edit that file to contain the following text:

logfile /var/log/ha-log
autojoin none
bcast eth0
warntime 5
deadtime 15
initdead 60
keepalive 2
crm yes
node node1.awi6.net
node node2.awi6.net

The last two lines should be modified for the appropriate hostnames for the WiDirect. Run this command on both devices to edit the keys file:

touch /etc/ha.d/authkeys
chmod 600 /etc/ha.d/authkeys
emacs /etc/ha.d/authkeys

The following text can be added to create a simple authkeys file:

auth 2
2 sha1 test-ha

A more secure authkeys file can be generated from the command line with the below command. That authkeys file - can then be copied to the other WiDirect.

*(echo –ne "auth 1\n1 sha1" *
*Dd if=/dev/urandom bs=512 count=1 | openssl md5) *
> /etc/ha.d/authkeys
chmod 600 /etc/ha.d/authkeys
(From the Linux High Availability User's Guide, http://linux-ha.org)

After those files have been updated the Heartbeat service can be started with these commands:

service heartbeat start
chkconfig heartbeat on

The next step will be to configure each of the individual services for failover. Run this command from the command line to start configuring the services:

crm configure

In the crm configuration window run these commands to configure the service for automatic failover:

```
primitive awicp_ap_ping_monitor lsb:awicp_ap_ping_monitor
primitive awicp_ap_snmp_monitor lsb:awicp_ap_snmp_monitor
primitive awicp_bandwidth_manager lsb:awicp_bandwidth_manager
primitive awicp_client lsb:awicp_client
primitive awicp_client_radius_listener lsb:awicp_client_radius_listener
primitive awicp_clientwatcher lsb:awicp_clientwatcher
primitive awicp_gardencrawler lsb:awicp_gardencrawler
primitive awicp_manager lsb:awicp_manager
primitive awicp_preproxy lsb:awicp_preproxy
primitive awicp_watchdog lsb:awicp_watchdog
primitive dhcpd lsb:dhcpd
primitive dnsmasq lsb:dnsmasq
primitive drbd_mysql ocf:linbit:drbd \
    params drbd_resource="drbd0" \
    op monitor interval="15s" \
    op start interval="0" timeout="240s" \
    op stop interval="0" timeout="100s"
primitive fs_mysql ocf:heartbeat:Filesystem \
    params device="/dev/drbd0" directory="/shared" fstype="ext3" \
    op start interval="0" timeout="60s" \
    op stop interval="0" timeout="60s"
primitive httpd lsb:httpd
primitive ip_dhcp ocf:heartbeat:IPaddr2 \
    params ip="10.4.1.1" nic="eth1" cidr_netmask="24"
primitive ip_mysql ocf:heartbeat:IPaddr2 \
    params ip="10.8.1.10" nic="eth0" cidr_netmask="16"
primitive mysqld lsb:mysqld
group mysql fs_mysql ip_mysql ip_dhcp mysqld dnsmasq httpd dhcpd awicp_client awicp_preproxy
awicp_ap_ping_monitor awicp_ap_snmp_monitor awicp_client_radius_listener awicp_bandwidth_manager
awicp_clientwatcher awicp_gardencrawler awicp_manager awicp_watchdog
ms ms_drbd_mysql drbd_mysql \
    meta master-max="1" master-node-max="1" clone-max="2" clone-node="max=1" notify="true"
location drbd-fence-by-handler-ms_drbd_mysql ms_drbd_mysql \
    rule $id="drbd-fence-by-handler-rule-ms_drbd_mysql" $role="Master" -inf: #uname ne f2.awi6.net
location prefer-t1 drbd_mysql 50: t1.awi6.net
colocation mysql_on_drbd inf: mysql ms_drbd_mysql:Master
order mysql_after_drbd inf: ms_drbd_mysql:promote mysql:start
property $id="cib-bootstrap-options" \
    dc-version="1.0.12-unknown" \
    cluster-infrastructure="Heartbeat" \
    stonith-enabled="false"
```

4.24.8 Further Configuration

It is important that the WiClients page be configured correctly when using multiple devices in one network. The GWID field is typically the MAC address of the eth1 interface on the WiDirect or WiClient with the colons removed. When using multiple devices the Secondary GWID field should be filled in with the MAC address of eth1 of the second device.

If failover is being used on the primary WiDirect, then it is important to rename the client to something other than “Local WiDirect.” If the client name is not changed then the primary GWID will be reset to the MAC address of whichever device is primary when the WiDirect starts up.

4.24.9 Failover Recovery

In many instances the two WiDirects will automatically recover, and no manual intervention will be necessary. In some instances, most notably if both WiDirects think they have been running independently of one another, the drives will be out of sync, which is known as a split brain condition. To recover from a split brain condition the administrator must determine which drive has newer data, and overwrite the contents of the drive with the older data. On the WiDirect with the out of date data, this command should be run:

drbdadm -- --discard-my-data connect drbd0

The other WiDirect should run this command:

drbdadm connect drbd0

If the above commands fail, some additional commands may need to be run on both devices before bringing everything back up:

service heartbeat stop
service drbd restart

After running the commands to sync the drives again, these commands will restart the failover services:

service drbd stop
service heartbeat start

4.24.10 Software Updates

These instructions do not cover how to handle software updates when running multiple WiDirect in a failover scenario. Certain functionality may stop working after an update is completed, and some configuration changes may need to be applied again. AllCity Wireless employees can give instructions on how to update WiDirects that are being used in a high availability environment.

4.25 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 a thumb drive with the following commands:

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

4.26 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

s*udo 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 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.

5.2 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.

5.3 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.

5.4 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.

5.5 System Verification

5.5.1 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.

5.5.2 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.

5.5.3 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.

A utility called iptraf is also available to monitor how much traffic is coming from each user on the WiDirect. Run the following command from the command line to install the iptraf utility:

sudo yum –y install iptraf

After the iptraf utility is installed it can be run using the following command:

sudo iptraf

To view the devices currently connected on the wireless network choose **LAN Station Monitor** from the first menu, then choose the interface eth1. The next screen, as shown in figure 5-1, will show the devices currently connected along with how much bandwidth each one is using.

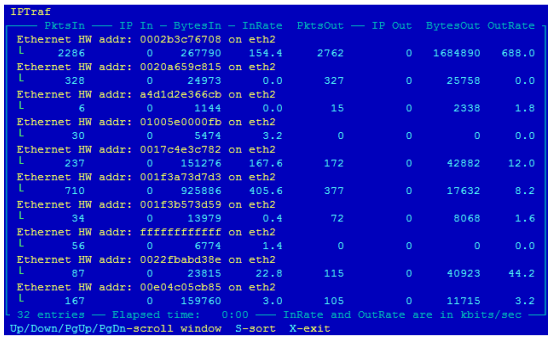


Figure 5-1: Monitoring Bandwidth with iptraf

5.5.4 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 an access point.

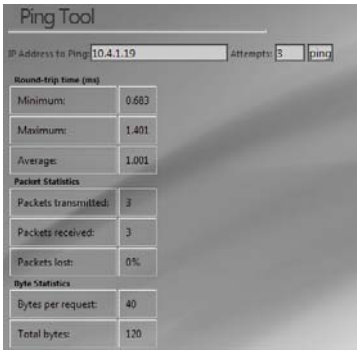


Figure 5-2: Ping Results

5.5.5 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.

5.5.6 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.

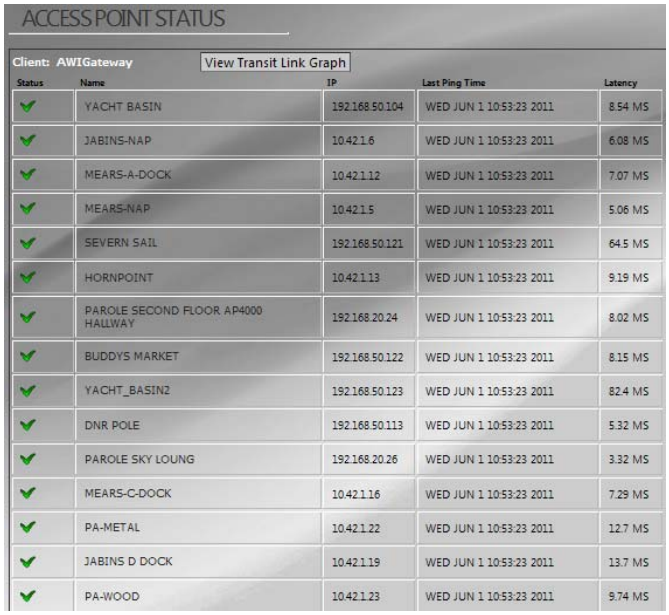


Figure 5-2: Access Point Status Page

6 Software

6.1 Software Upgrades & Patching

Upgrades are available on a remote server for customers on an active support contract. To find more details about the upgrades available, please contact the support number for this product.

To activate the upgrade:

1) Perform backup as per instructions in section 4.9.
2) Run “sudo yum update awicp*” from the command line.

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 **power** button and a **reset** button.
The LEDs from left to right are temperature alarm, Eth1 network activity, Eth0 network activity, hard disk activity, and Power.

Figure 7-2 shows the back of the Base WiDirect ACW 50.

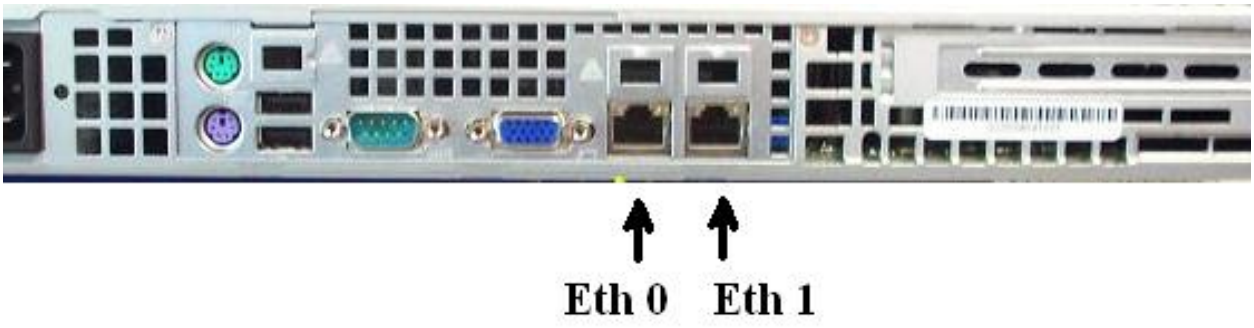


Figure 7-2: Back of the WiDirect

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.

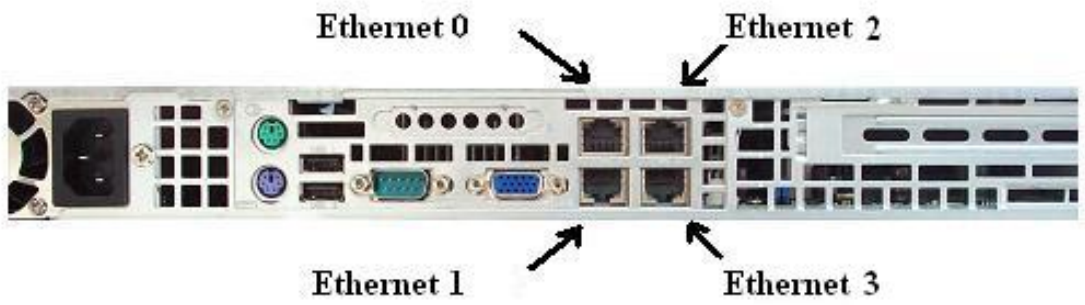


Figure 7-3: Back of the WiDirect Pro and WiDirect Enterprise

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:

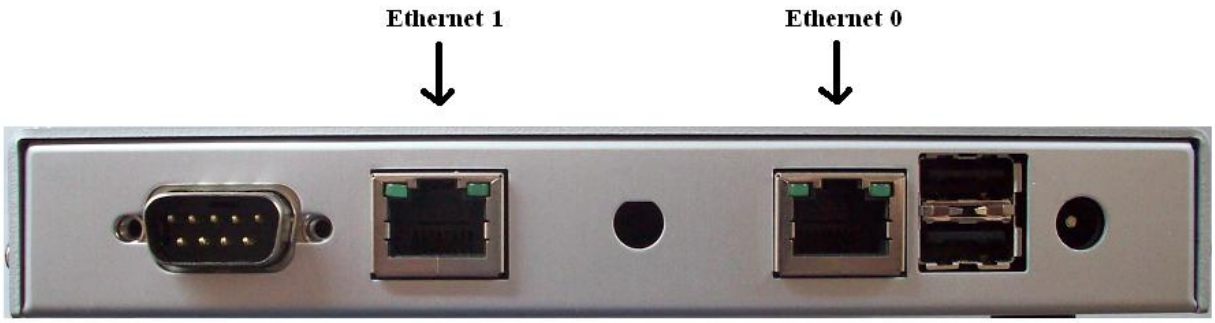


Figure 7-5: Back of WiDirect Micro

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.

Figure 7-6 Shows the Back of the WiDirect Carrier:

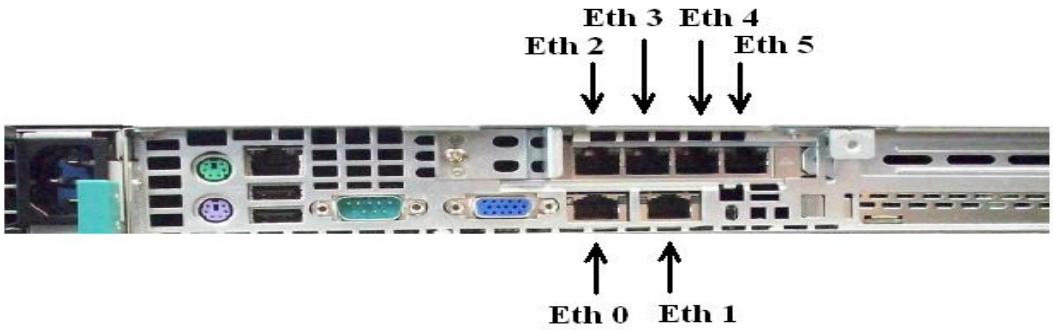


Figure 7-6 Back of WiDirect Carrier

The important ports on the back of the WiDirect Pro and Enterprise are Serial, Eth0, Eth1, Eth2, Eth3, Eth4, Eth5. 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.

8 Technical Support

Support Contact Details

Dedicated Phone Support: (443) 294-0000
Dedicated e-mail support: support@allcitywireless.com
Self-support: www.allcitywireless.com/support
Corporate Address: 326 First Street Suite 23
Annapolis, MD 21403