54Mb Hotspot-in-a-Box

P-560

User's Guide

Revision 1.2

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Gemtek systems

www.gemtek-systems.com

Federal Communication Commission Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC Caution: To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

IMPORTANT NOTE:

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Gemtek Systems declares that P-560 (FCC ID: MXF-AP930621G) is limited in CH1~CH11 by specified firmware controlled in U.S.A.

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About this Guide

Purpose

This document provides information and procedures on hardware installation, setup, configuration, and management of the Gemtek Systems high performance 56Mb Hotspot-in-a-Box model P-560. The P-560 is a highly integrated Access Controller for public access areas. We will call it AC later in the manual.

Prerequisite Skills and Knowledge

To use this document effectively, you should have a working knowledge of Local Area Networking (LAN) concepts and wireless Internet access infrastructures. In addition, you should be familiar with the following:

- Hardware installers should have a working knowledge of basic electronics and mechanical assembly, and should understand related local building codes.
- Network administrators should have a solid understanding of software installation procedures for network operating systems under Microsoft Windows 95, 98, Millennium, 2000, NT, and Windows XP and general networking operations and troubleshooting knowledge.

Conventions Used in this Document

The following typographic conventions and symbols are used throughout this document:

	Very important information. Failure to observe this may result in damage.
	Important information that should be observed.
	Additional information that may be helpful but which is not required.
bold	Menu commands, buttons and input fields are displayed in bold
`code`	File names, directory names, form names, and system-generated output such as error messages are displayed in constant-width type
`<value>`	Placeholder for certain values, e.g. user inputs
[value]	Input field format, limitations, and/or restrictions.

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If you encounter problems when installing or using this product, please consult the Gemtek Systems website at www.gemtek-systems.com for:

- Direct contact to the Gemtek Systems support centers.
- Frequently Asked Questions (FAQ).
- Download area for the latest software, user documentation and product updates.

Chapter 1 – Introduction

Thank you for choosing the Gemtek Systems 54 Mb High Performance Hotspot-in-a-Box.

The Gemtek Systems P-560 is a high performance and highly integrated Access Controller for public access networks. It combines a high-speed wireless LAN Access Point, an IP Router, a 4-port LAN Switch and a complete Access Controller for Wi-Fi Hotspots in one box. One single P-560 can serve up to 100 simultaneous users (depending on SW license), takes control over authentication, accounting and routing to the Internet as well as to the operator's central.

Product Overview

Scalable With Customer Needs

The P-560 Access Controller can be ordered with three different software licenses allowing operators to extend functionality as their business grows. The basic "**Bronze**" license already supports all required functions to operate a public access network for up to 20 simultaneous subscribers. The "**Silver**" license is an upgrade for unlimited users (up to 100) and multiple WISP support whereas the "**Gold**" software enables wireless LAN switching and remote AP management to the network.

Authentication, Authorization & Accounting

The P-560 supports multiple secure authentication methods from standard web browser login (Universal Access Method), MAC authentication, to 802.1x/EAP with passwords, certificates or SIM cards. The integrated real-time accounting system is based on standard RADIUS/EAP and supports various billing plans from prepaid, pay-per-time, per-volume, per-use or flat rate. Integration into existing OSS/BSS systems can be done with ease.

Service Differentiation

The integrated Web server of the P-560 allows flexible interaction with common web application servers, facilitating the provisioning of differentiated services with bandwidth management, location based and personalized services. Inter-Provider roaming and multi-OSS support is guaranteed by the persistent usage of standardized protocols and interfaces like RADIUS, HTTPS and XML. As all Gemtek Systems Access Controllers P-560 is compliant with the recommendations of the Wi-Fi Alliance WISP roaming group.

Remote Control

The P-560 Hotspot-in-a-Box is placed at the edge of a broadband access network and allows operators to provide cost effective public Wi-Fi services, by managing per user access control, device configuration, and radio performance centrally from the operations centre. HTTPs, telnet, SSH or SNMP over VPN can be used for secure remote management.

Privacy

P-560 supports different levels of security and data encryption. Client stations can be separated on link layer (Layer2 User Isolation), preventing intruders from accessing the hard discs of other users. User credentials (passwords) are protected by SSL or EAP-based authentication methods. User traffic can be encrypted either by VPNs (pass-through) by Wi-Fi Protected Access (WPA). Operators and service providers can make use of the integrated VPN/tunneling protocols to protect AAA and management traffic.

Management Options

You can use the Access Controller management systems through the following interfaces:

- Web-browser interface
- Command Line interface (CLI)
- Simple Network Management Protocol (SNMP v1, v2, v3)

The AC management system pages are organized the same way for the web-browser interface and the CLI. This user manual provides detailed description of each management option.

Access Controller Features

WLAN

- 802.11b+g compliant, 1-54Mbps with auto-fallback
- Wi-Fi compliant
- Concurrent 802.11b and 802.11g access
- WDS support (concurrent bridge and AP mode)
- WPA support
- Antenna diversity
- SMA connectors for external antennas
- Adjustable RF output power
- High receiver sensivity (up to -90 dBm@1Mbps, 8%PER)

AAA

- Multiple authentication methods: UAM, 802.1x/EAP, RADIUS, MAC, Smart Client (e.g. iPass)
- WISPr compliant
- Internal and external accounting backups
- Internal or external web server
- Remote user login, logout, session status control via https/XML
- AAA proxy server (for simultaneous EAP and UAM)
- Per user bandwidth management
- Web proxy support

IP Router and IP address management

- Static IP routing table
- NAT/NAPT (IP masquerading)
- Port-forwarding
- Transparent VPN client pass-through (PPTP, IPsec ESP)
- Selective source routing (in preparation)
- PPPoE client
- PPTP client
- DHCP server, relay gateway (suboptions), DHCP client
- Multiple IP pools per user group
- UAT (Universal Address Translation)
- SMTP redirection (e-mail)

VPN

- PPTP VPN client, max. 16 tunnels
- MPPE (40, 56, 128 bit encryption)
- GRE VPN client, max. 16 tunnels
- IPsec client (in preparation)

LAN switch

- Managed 4-port switch 10/100Mb, auto-sensing
- 802.1q/p tagged VLAN support (in preparation)

Management

- Secure management via https, SSH, SNMP
- SNMP proxy
- SNMPv3 (incl. authentication and encryption)
- Management subnet for remote AP and switch management
- Remote firmware update

Installation

This chapter provides installation instructions for the hardware and software components of the Access Controller P-560. It also includes the procedures for the following tasks:

- Hardware Introduction (LEDs, Connectors)
- Connecting the Access Controller
- First Configuration
- Step-by-Step Setup

The Product Package

The Access Controller comes with the following:

- 54Mb High Performance Hotspot-in-a-Box (model: P-560)
- Detachable Antennas (SMA type, 2 units)
- Power Cord for EU (1 unit)
- Power Adapter (5V, 2.5A, 1 unit)
- Ethernet Patch Cable (STP, 1.8 m length, 2 units)
- Mounting Kit, included tool to remove AP from wall mounting (1 unit)
- Installation CD containing:
  - P-560 User Guide in PDF format
  - User Pages Templates Samples
  - KickStart Utility
  - Product Firmware
  - Release Notes
  - Adobe Acrobat Readers
- Printed Warranty Note

If any of these items are missing or damaged, please contact your reseller or Gemtek System sales representative.

Hardware Introduction

General Overview

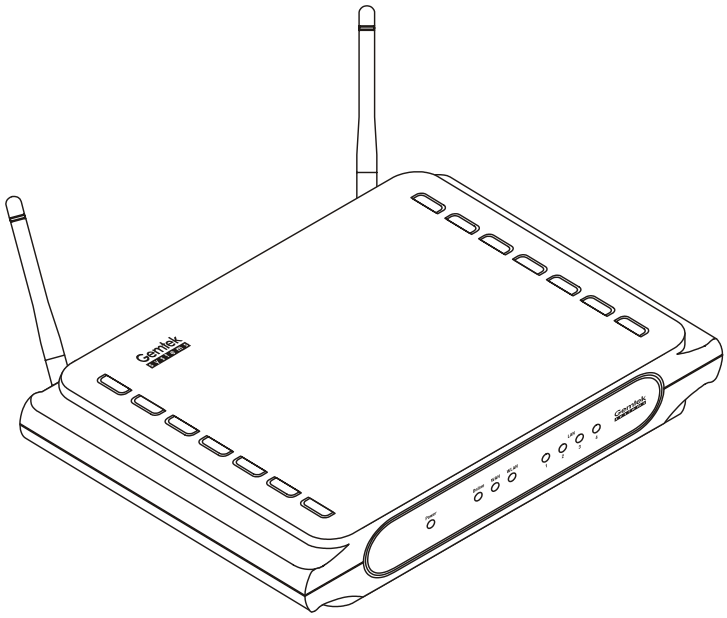


Figure 1 – P-560 Access Controller General View

The front panel of the Access Controller contains:

- A series of indicator lights (**LEDs**) that help describe the state of various networking and connection operations.

The reverse panel of the Access Controller contains:

- **Connectors** which enable you to make different network connections for the controller
- **Reset** button enables you to reboot or reset the device configuration to the factory defaults

Press the **Reset** button for less than **5** seconds to **reboot** the controller.

Press the **Reset** button for more than **5** seconds to **set** the controller **to factory defaults**.

Back Panel

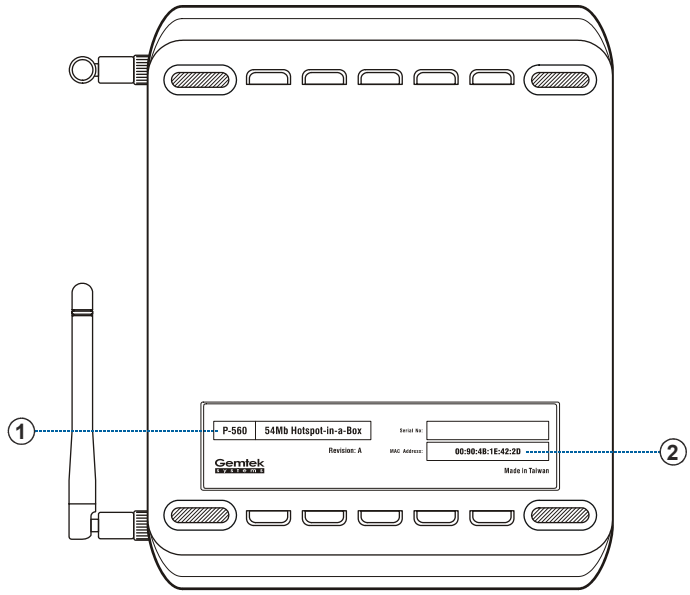


Figure 2 – Back Panel of the P-560

The back panel of the Access Controller contains:

- **Model** and **device** name (see item 1 in figure above). The official device name is **54Mb Hotspot-in-a-Box**, model **P-560**.
- **MAC address** of the device. The label (item 2 in figure above) shows the **WLAN interface MAC** address of the device. You can determine the **WAN** and **LAN** interfaces' MAC addresses by a simple calculation:
  - **LAN interface MAC = WLAN MAC + 1**
  - **WAN interface MAC = WLAN MAC + 2**

LEDs

The Access Controller has several LEDs located on the front panel:

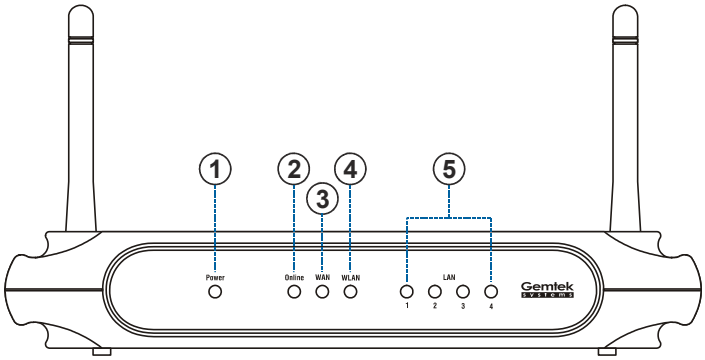


Figure 3 – LEDs of the P-560

The various states of the LEDs indicate different networking and connection operations as follows:

Item	LED	Color	Status	Indication
1	Power	Green	On	P-560 is active/working
			Blink	P-560 is booting
		Orange	On	Writing to FLASH memory
2	Online	Green	On	PPPoE/PPTP/GRE tunnel for DSL is active on P-560
			Off	No active PPPoE/PPTP/GRE tunnel for DSL on P-560
3	WAN	Orange	On	WAN active/working
4	WLAN	Orange	On	WLAN active/working
5	LAN (1, 2, 3, 4)	Green	On	100 Mbps network connection exists
		Orange	On	10 Mbps network connection exists

Connectors

The Access Controller has several connectors on the rear panel:

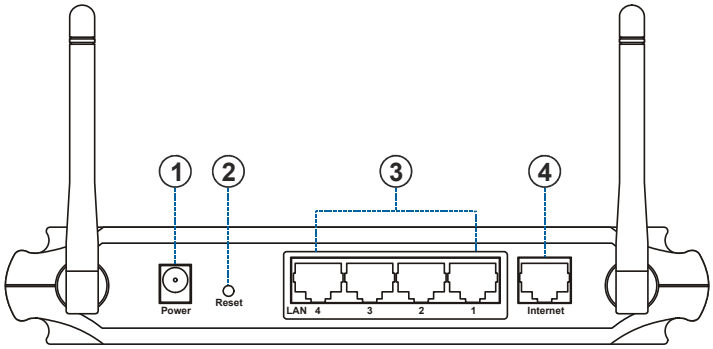


Figure 4 – Connectors

Descriptions of the connectors are given in the following table:

Item	Connector	Description
1	Power	For power supply
2	Reset	Reboot or reset to factory defaults. Press the reset button for **less** than **5** seconds to reboot the controller. Press the reset button for **more** than **5** seconds to set the controller to factory defaults
3	LAN (1, 2, 3, 4)	For enterprise applications use this port to connect your company LAN, Intranet or to hotspot access points
4	Internet	For Internet connection

Connecting the Access Controller

Use the following procedure to prepare your network connection to the Access Controller.

Use the enclosed power adapter and power cord for power supply of your Access Controller.

Step 1 Place the Access Controller on a flat work surface.

Step 2 Connect one Ethernet patch cable to the LAN port of the Access Controller and to a free hub port on your local network.

Step 3 Connect one Ethernet patch cable to the WAN port of the Access Controller and to an Ethernet port of a broadband Internet modem or router.

Step 4 Connect the power cord to your power adapter. Connect power adapter to the Access Controller.

Step 6 Wait 30 seconds until the boot process is finished and check to ensure that at least the following LEDs are ON:

- Status LED (steady On)
- WAN LED
- LAN LED
- WLAN link LED

Initialization

There are two choices for the first web browser connection to your Access Controller: either you enter your access controller's IP address and subnet (default networks settings) into the browser or you launch the **KickStart** utility that is provided with your product CD.

The default network settings for your new access controller are:

```
LAN port:            IP 192.168.3.1       subnet 255.255.255.0
WAN port:            IP 192.168.2.66      subnet 255.255.255.0
WLAN port:           IP 192.168.4.1       subnet 255.255.255.0
DHCP Server:         enabled for LAN and WLAN ports
```

For other management methods: SNMP and command line interface (CLI) please refer to their respective chapters.

Software Introduction: KickStart

The Gemtek Systems **KickStart** is a software utility that is included on the Installation CD.

The utility automatically detects access points and access controllers installed on your network, regardless of its host IP address and lets you configure each unit's IP settings. The feature list for the **KickStart** utility is listed below:

- Scanning your subnet for all connected APs, ACs
- Quick access to your AC via HTTPS, telnet, SSH
- Setting new IP address of your AC
- Reset to factory default settings
- Default access (in case of lost administrator password)
- Firmware updates

To install the **KickStart** utility insert the Installation CD into your CD-ROM drive. Find and install the utility from the product CD into the computer.

If the Installation CD does not start automatically, please run "**autorun.exe**" manually from the root directory of the installation CD.

Access Your P-560

There are two choices for the first Web browser connection to your access point:

- Use the **Web browser**.
- Launch the **KickStart** utility that is provided with your product CD.

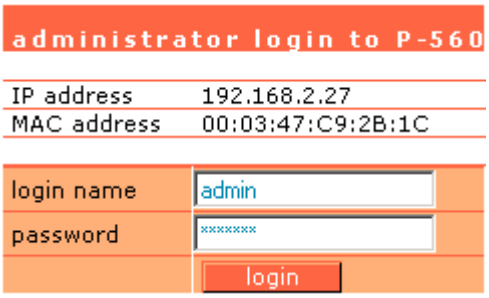
If first method is preferred follow these instructions:

Step 1 Configure your PC with a static IP address on the 192.168.2.0 subnet with mask 255.255.255.0. Connect the P-560 in to the same physical network as your PC. Open the Web browser and type the default IP address of the P-560:

```
https://192.168.2.66/a.rg
```

Step 2 Enter the P-560 administrator login details to access the Web management.

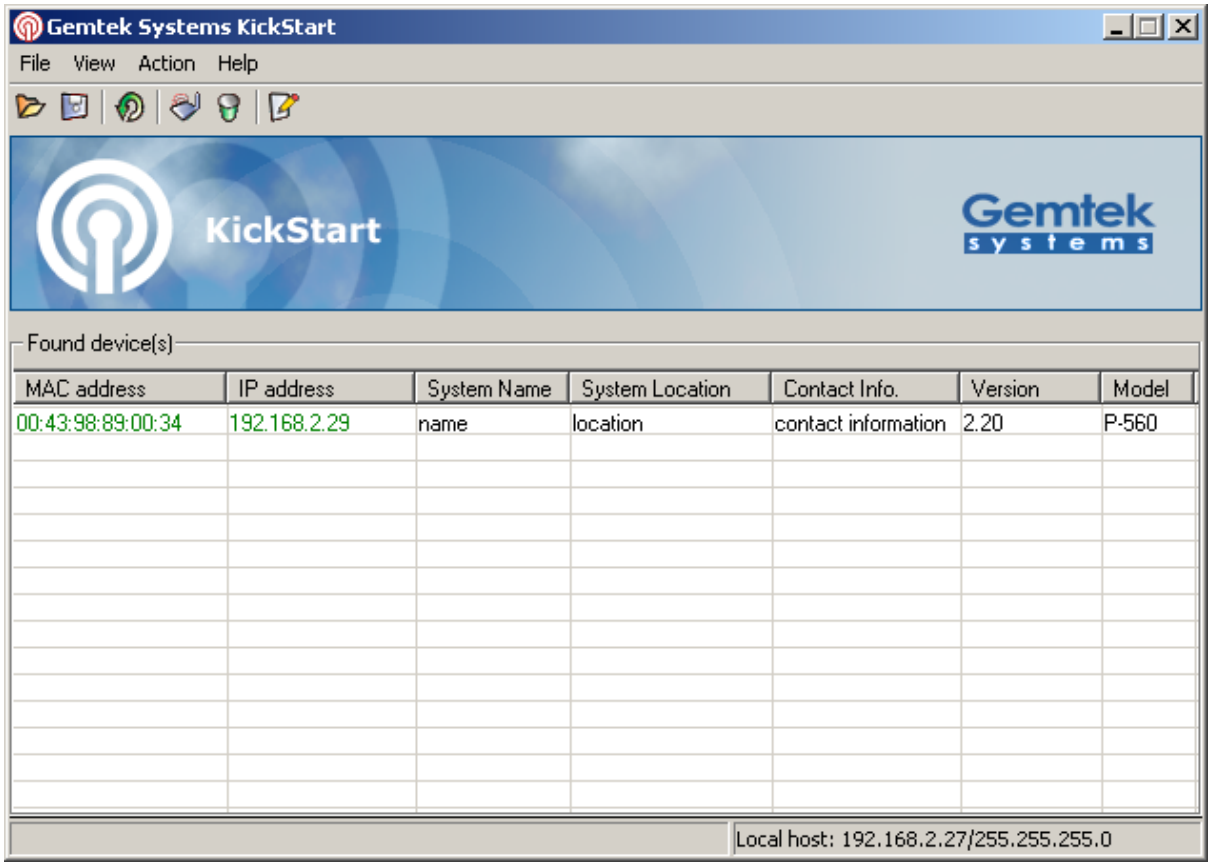
The default administrator log on settings for all access point interfaces are:
User Name: **admin**
Password: **admin01**



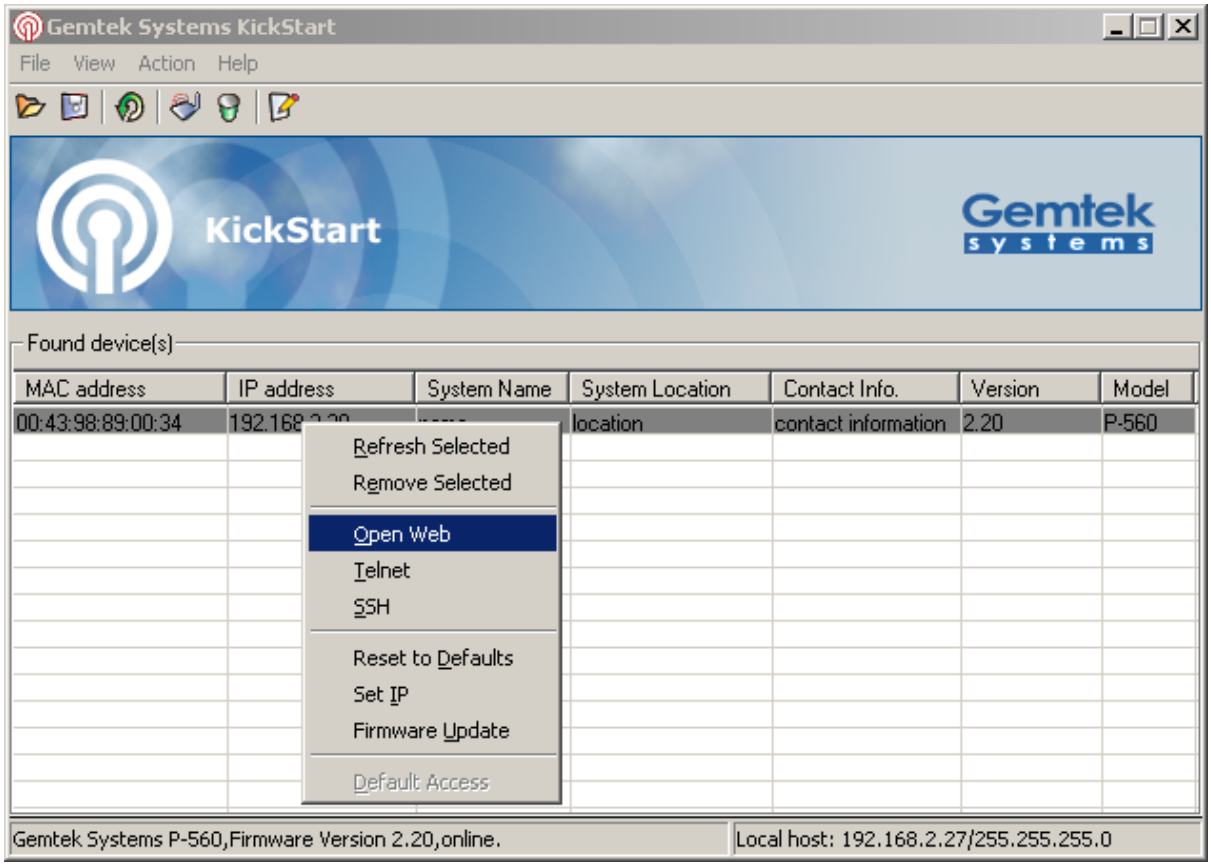
Step 3 After successful administrator log on you will see the main page of the access controller's **Web interface**:

If second method is prefered follow the instuctions:

Step 1 Install the **KickStart** utility from the **Installation CD**. Click **Start > Programs > GSI > KickStart** to launch the application. If the P-560 device is connected to your network, the utility will automatically find your AC:



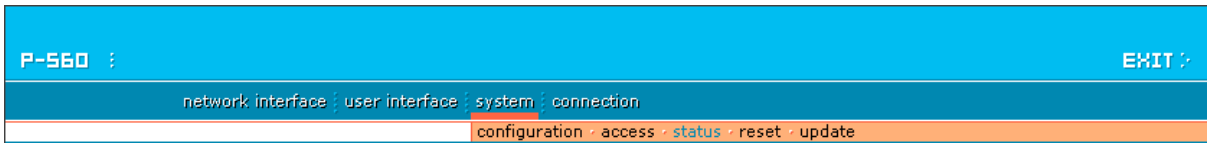
Step 2 Select your controller and right click. Select **Open WEB** item to launch the web management interface through the secure https connection:



Step 3 Enter the Access Controller administrator login settings to access the **web management** interface.

The default administrator log on settings for all controller interfaces are:
User name: **admin**
Password: **admin01**

Step 4 After successful administrator log on you will see the controller **web interface**. The controller system statistics page is displayed by default:



If you cannot connect to the device via your web browser because of TCP/IP mis-configuration, you can reset the product to the factory default. Press the reset button for more than 5 seconds.

Now you are enabled to perform the initial controller configuration. Follow the next section for step-by-step setup instruction to configure the device according to your needs.

Step by Step Setup

Step 1. Interface Set-Up

In the **network interface | configuration** menu you can set the TCP/IP settings. Eth0 is pre-configured as the WLAN port of your Access Controller, Ixp1 is the WAN port, and Ixp0 is the LAN port. You can modify these settings according to your local network requirements. Make sure that IP subnets do not overlap.

interface configuration

interface	status	type	IP address	netmask	gateway	action
eth0	enabled	LAN	192.168.4.1	255.255.255.0	ixp1	edit
ixp0	enabled	LAN	192.168.3.1	255.255.255.0	ixp1	edit
ixp1	enabled	WAN	192.168.2.66	255.255.255.0	*192.168.2.1	edit

Figure 5 – Interface Configuration Settings

If DHCP client, PPPoE, or PPTP is selected as a dial-up protocol for the WAN interface the WAN settings of this table will be overwritten by the values retrieved from the Internet Provider.

Step 2. DNS Set-Up

In the **network interface | DNS** menu you can specify your local domain name server or enter the DNS server provided by your ISP (Internet Service Provider).

DNS

type	IP address	action
primary	195.14.162.78	edit
secondary	0.0.0.0	edit

Figure 6 – DNS Redirection

DNS is set automatically if provided by the ISP dynamically via DHCP, PPPoE or PPTP.

Step 3. IP Address Management

For automatic IP assignments to client stations, set the **DHCP settings** in the **network interface | DHCP** menu according to your TCP/IP configuration from **step 1**. Only use address ranges within the corresponding IP subnet of the LAN interface. In addition you can switch on the Universal Address Translation function in the **system | access | UAT** menu. With **UAT** users do not need to change their local TCP/IP settings to log on to the Access Controller. The Access Controller will translate fixed IP numbers used in private networks transparently for the user.

Please refer to **Chapter 3 – Universal Address Translation** for further details to avoid IP conflicts.

Step 4. RADIUS Set-Up

In the **network interface | RADIUS settings** menu you can first define the local settings of the integrated **RADIUS** client of the Access Controller. For example you can modify timeouts and the **NAS server ID** (name of the RADIUS client):

RADIUS settings

setting	value	action
RADIUS retries	5	
RADIUS timeout (seconds)	2	
NAS server id	TEST	update cancel
user session timeout (seconds)	18000	
user accounting update interval (seconds)	600	
user accounting update retry (seconds)	60	
user idle timeout (seconds)	900	
location ISO country code	us	
location E.164 country code	1	
location E.164 area code	408	
location network	GEMTEK_SYSTEMS	
hotspot operator name	GEMTEK_SYSTEMS	
location	Terminal_Worldwide	
bandwidth up	128.00 Kbps	
bandwidth down	128.00 Kbps	

Figure 7 – RADIUS Settings

On the second page: **network interface | RADIUS servers** you can specify up to 32 different **RADIUS** servers for authentication and accounting (see *Figure 8 – RADIUS Servers*). The first line of this table is the default server (can be configured as default). Thus, if a user cannot be associated to any specific service provider by his login name, the Access Controller will send authentication and accounting messages to the first **RADIUS** server on the list.

RADIUS servers

name	type	IP address	port	secret	action
DEFAULT (default)	authentication	195.14.175.137	1812	testing123	details edit delete
	accounting	195.14.175.137	1813	testing123	
					new

Figure 8 – RADIUS Servers

Make sure that the **RADIUS** server is up and running and is able to receive authentication requests from the Access Controller.

On the download pages at www.gemtek-systems.com you will find quick installation guides for common RADIUS servers.

Step 5. Welcome/Login/Start pages

The most popular authentication method for public users is the **UAM** (Universal Access Method). **UAM** can be enabled using the **system | access | AAA** menu. With UAM users can log-on to the Access Controller using their web browser. As an operator of a wireless access service you can provide a custom set of web pages to your subscribers.

- **welcome** page (default = **on**) - the first page that is presented when users start their web browser.
- **login** page (default = **on**) – the page containing the log-on fields for user name and password. This page is presented as default when the welcome page is disabled.
- **logout** page (default = **on**) - the page that pops up after successful authentication. It includes information about the online session such as online time and transferred data.
- **help** page (default = **on**) - the page with online help information for log-on.
- **start** page (default = **on**) - the default-page that will be presented to the user after successful log-on.
- **unauthorized** page (default = **on**) - the page which appears if web login method is disabled.

The default user login page looks like the picture below:

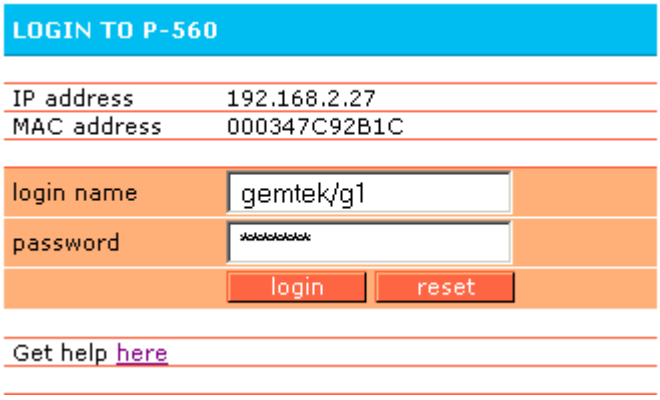


Figure 9 – Example of a Simple Login Page

You have full flexibility to modify and adapt all these pages to your needs and personal designs. For initial set up and testing we recommend you use the default configuration, which will present a simple login window with input fields for user name and password.

Enter any **start** page you like in the **user interface** | **start page** menu. In addition you can define a number of free web sites in the **walled garden** table on the **user interface** menu.

For more information on how to build your own user pages please refer to **Chapter 4 – User Pages**.

Step 6. Change Administrator Password

Before saving your initial configuration don't forget to change the administrator password in the **user interface | administrator** menu.

Step 7. E-mail Redirection

If you have a SMTP mail server available for your subscribers enter its IP address and SMTP port number in the **connection** menu under the item **e-mail redirection**. All outgoing e-mail passing through the Access Controller will be redirected to this server.

Step 8. Save Configuration and Restart

Make sure you have saved your changes from each of the first seven steps and then press the **restart** button on the lower side of the **web management** screen. After 10-15 seconds you can re-load the admin pages or start to log on to the Access Controller as a user.

Users connected to the LAN port of the Access Controller can type in any URL in their browser and they will be redirected to your defined **welcome** (if enabled) and **login** pages. Administrators can monitor connected users via the **connection | users** menu.

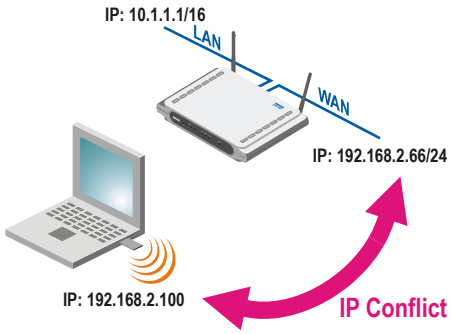
Chapter 3 – Universal Address Translation

Universal Address Translation (UAT) allows Hotspot operators to offer true Plug&Play access for their subscribers.

With **UAT** enabled, the Access Controller will automatically and transparently translate fixed IP settings (IP address, gateway, DNS, proxy server) on a user's PC enabling him to connect to the broadband Internet service.

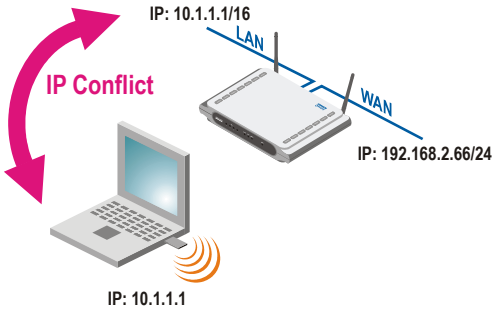
Without **UAT** public access, subscribers are forced to switch their TCP/IP settings to **DHCP** (automatic IP address assignment), potentially losing any fixed IP address settings they previously entered.

When using **UAT** operators have to be aware of some principal limitations:



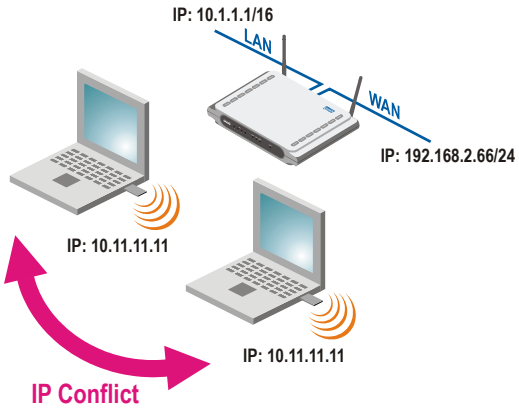
Conflict: Subscribers cannot access WAN services if their IP address overlaps the IP subnet of the WAN port.

Work-around: Use a public IP address or a seldom-used private IP address (range) for the WAN port.



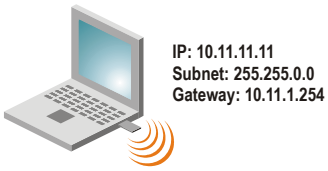
Conflict: Subscriber's IP address must not be identical to the LAN IP address of the Access Controller.

Work-around: Use a seldom-used IP address range for the LAN port.



Conflict: Two subscribers connected to one Access Controller cannot use the same IP address. For instance, this situation can happen when DHCP and UAT are used in parallel.

Work-around: Enable the DHCP service.



The subscriber's IP address and gateway address must be in the same subnet (a real network configuration).

Chapter 4 – User Pages

This chapter describes what the user pages are and how to manage them. Detailed instructions on how to change and upload new user pages are given below.

When launching his/her web browser the user's initial HTTP request will be redirected to an operator defined set of web pages, further called the "user pages". User pages are:

- **Welcome** page– the first page presented to the user.
- **Login** page**–** subscriber authentication page, allows the user to login to the network.
- **Logout** page– small pop-up window for logged-on user statistics and log-out function.
- **Help** page – get help with the login process.
- **Unauthorized** page – this page is displayed when web login or EAP login methods are disabled on the Access Controller for subscribers.
- **One Click** page – the additional pop-up pages, displayed when one click roaming for the third party WLAN operators are preconfigured.

All further presented user pages are factory default. The Hotspot operator can upload new templates for all user pages.

User Pages Overview

Welcome Page

Welcome page is the first page a Hotspot subscriber receives when he starts his web browser and enters any URL. By default it's a very simple page and provides only a link to the **login** page.

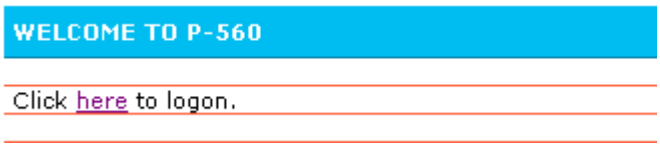


Figure 10 – Welcome Page

The Hotspot operator can change the **welcome** page according its needs. See more details in section: **Changing User Pages.**

Login Page

The subscriber gets to the **login** page after clicking the link on the **welcome** page. The **login** page is loaded from the Access Controller. To get access to the network, the user should enter his authentication settings: **login name** and **password** and click the **login** button:

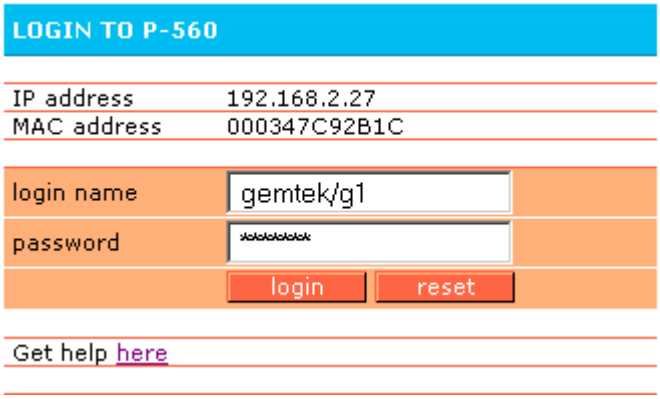


Figure 11 – Simple Login Page

The login name and password can be obtained from your Hotspot Operator. Login format available for P-560:

- username@WISPdomain
- WISPdomain/username

The **login** page also displays subscriber's logical and physical network addresses (IP and MAC). Once authenticated, a **start** page appears. In addition, a smaller **logout** window (page) pops up.

The Hotspot operator can change the **login** page according to its needs. See more details in section: **Changing User Pages.**

Logout Page

Make sure the JavaScript is enabled on your Web browser; otherwise you will not receive the **logout** page.

The **Logout** page contains the detailed subscriber's session information and provides function for logging out of the network:

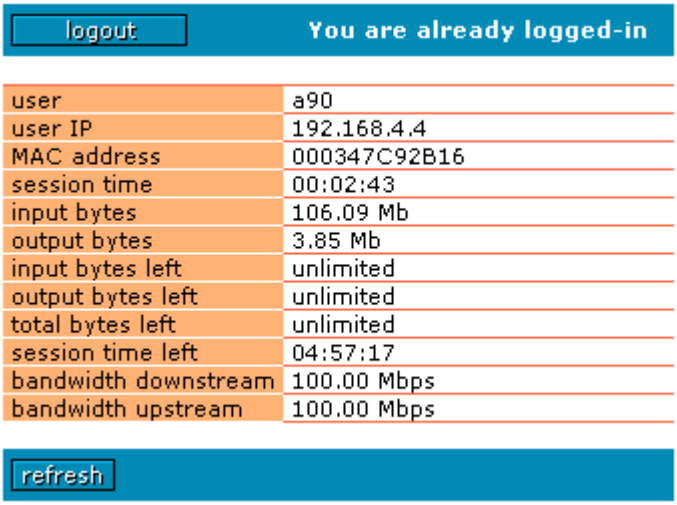


Figure 12 – Logout Page

Detailed AC subscriber's session information includes:

User – subscriber's login name.

User IP – subscriber's logical network name (IP address).

MAC Address – subscriber's physical network address.

Session time – subscriber's session time from client log on in format: [hours: minutes: seconds].

Input/Output bytes – subscriber's session input and output statistics in bytes.

Input/Output bytes left – session input and output bytes left for subscriber limited from RADIUS [in B, KB, MB, GB and unlimited].

Total bytes left – session total (input and output) bytes left for subscriber limited form RADIUS [in B, KB, MB, GB and unlimited].

Session time left – session time left in format: [hours: minutes: seconds].

Bandwidth downstream/upstream – available upstream and downstream bandwidth for subscriber limited from RADIUS [in bps].

Logout button – click the button to logout from the network. The log-out pop-up window closes.

Refresh button – click the button to refresh the subscriber session information.

The Hotspot operator can change the **logout** page interface according to its needs. See more details in section: **Changing User Pages**. All session details are further accessible via the operator XML interface.

Help Page

Click on the **get help** link in the **login** page for help tips related to network registration. A page appears similar to the following:

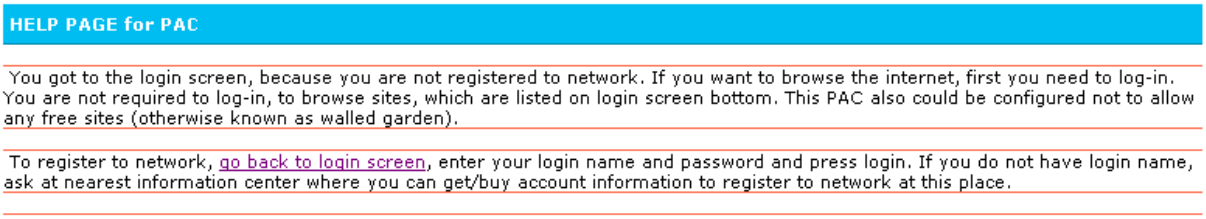


Figure 13 – Help Page

The Hotspot operator can change the **help** page according to its needs. See more details in section: **Changing User Pages.**

Unauthorized Page

If web log-on method (UAM) or EAP-based authentication methods are disabled on the AC and the subscriber attempts to login to the network, he will receive the following page:

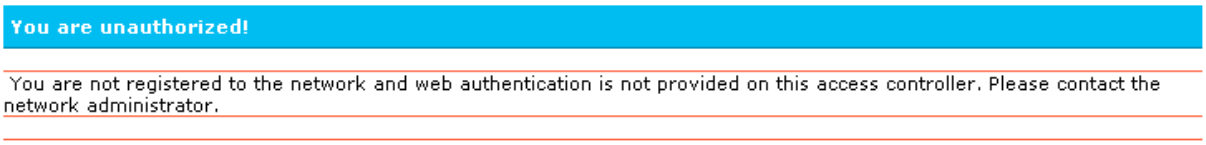


Figure 14 – Unauthorized Page

The Hotspot operator can change the **unauthorized** page according to its needs. See more details in section: **Changing User Pages.**

Changing User Pages

As the Hotspot operator you can modify the user pages freely according to your personal needs and preferences. User Page templates can be either stored locally on the AC or on an external web server.

See the Appendix: **G) User Pages Templates Syntax** to find the syntax and comments of all user pages.

Use the **user interface | configuration** menu to modify user pages. There are two ways to change and store new user page templates:

- **External** – linking new user page templates from an external server.
- **Internal** – upload new templates to local memory.

Supported user pages template formats:

- **XSL** (Extensible Style sheet Language) for welcome/login/logout/one click pages.
- **HTML** (Hypertext Markup Language for help/unauthorized pages.

The following image formats are supported for new templates. Other formats are not accepted:

- **PNG**
- **GIF**
- **JPG**

The following examples demonstrate the use of internal and external user pages.

User Pages templates samples can be found in the **Installation CD** delivered to you with the product.

Example for External Pages

Step 1 Prepare your new user pages template for each user page: welcome/login/logout/help/unauthorized/oneclick.

Step 2 Under the **user interface | configuration | pages** menu select the user page you want to change (e.g. login)

pages

page	use	status	location	action
welcome	internal	enabled	welcome.xsl	
login	internal	-	login.xsl	update cancel
logout	internal	-	logout.xsl	
help	internal	-	images/help.html	
unauthorized	internal	-	images/unauthorized.html	
one click	internal	-	oneclickuser.xsl	

Step 3 Choose the **external** option under the **use** column:

pages

page	use	status	location	action
welcome	internal	enabled	welcome.xsl	
login	external	-	login.xsl	update cancel
logout	internal	-	logout.xsl	
help	internal	-	images/help.html	
unauthorized	internal	-	images/unauthorized.html	
one click	internal	-	oneclickuser.xsl	

Step 4 Specify the new user page location in the **location** field (http://servername/filelocation):

pages

page	use	status	location	action
welcome	internal	enabled	welcome.xsl	
login	external	-	http://192.168.2.27/login.xsl	update cancel
logout	internal	-	logout.xsl	
help	internal	-	images/help.html	
unauthorized	internal	-	images/unauthorized.html	
one click	internal	-	oneclickuser.xsl	

Do not try to upload other than supported formats. Such uploaded pages will not be displayed properly.

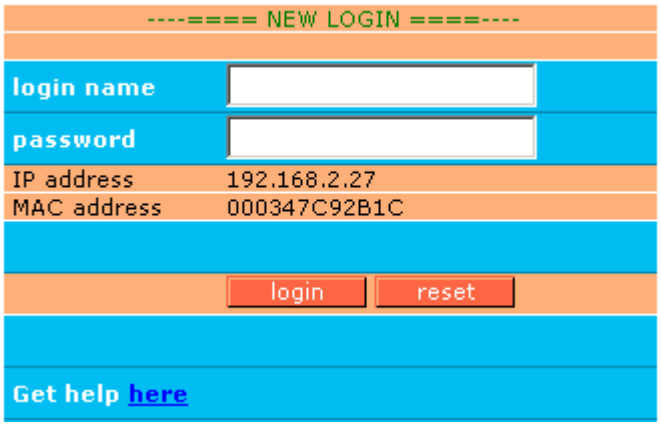
Step 5 Save entered changes with the **apply changes** button:

pages

page	use	status	location	action
welcome	internal	enabled	welcome.xsl	change
login	external	-	http://192.168.2.27/login.xsl	change
logout	internal	-	logout.xsl	change
help	internal	-	images/help.html	change
unauthorized	internal	-	images/unauthorized.html	change
one click	internal	-	oneclickuser.xsl	change

apply changes discard changes

Step 6 Check for new uploaded user page (e.g. login):



If at anytime you wish to restore factory default user pages, click the **reset** button under the **system | reset** menu.

Example for Internal Pages

We will use the **user pages** templates from the **Installation CD** to show the example how to upload the internal pages. Follow the steps below:

Step 1 Ensure that **internal** option is selected for **all** user pages you want to change. By default internal option is defined for all pages:

pages

page	use	status	location	action
welcome	internal	enabled	welcome.xsl	change
login	internal	-	login.xsl	change
logout	internal	-	logout.xsl	change
help	internal	-	images/help.html	change
unauthorized	internal	-	images/unauthorized.html	change
one click	internal	-	oneclickuser.xsl	change

Step 2 Under the **user interface | configuration | upload** menu click the **upload** button to upload new prepared user pages:

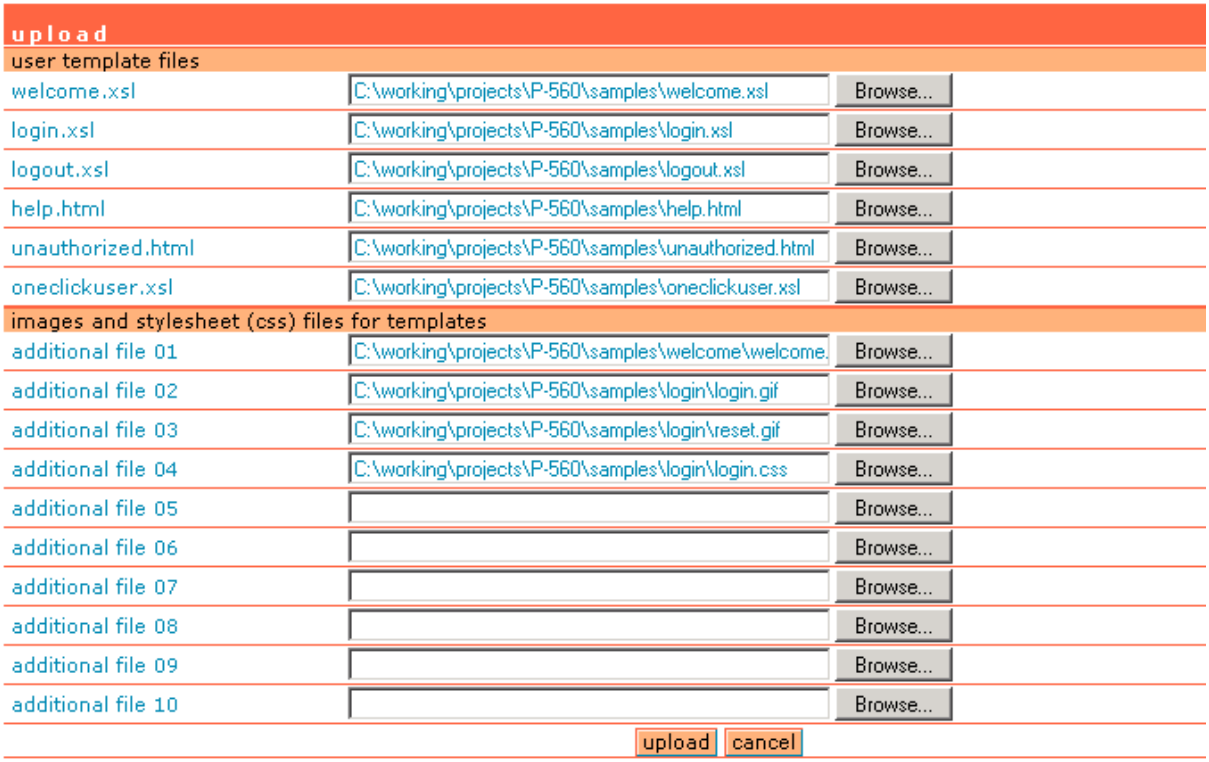
upload

description	action
Before uploading new template files and images, please delete old files. There is limited space on server for templates and images.	delete
Upload new template files and images. Old files will be overwritten, if exist with the same name. If you need, you can repeat upload process few times, until upload all needed images (you do not need to upload template files twice). Please remember, that server space is limited! All files will be uploaded to "images" directory, please prepare your templates to use images and stylesheets from that directory.	upload

The memory space in the AC for internal user pages is limited to **1 MB**.

Step 3 Specify the location (**Examples** directory if you use the **Installation CD**) of new user page templates by clicking the **browse** button or enter the location manually.

Specify the location for the additional files of new user page templates: images and a cascading style sheet file (**css**) by clicking the **browse** button or enter the location manually:

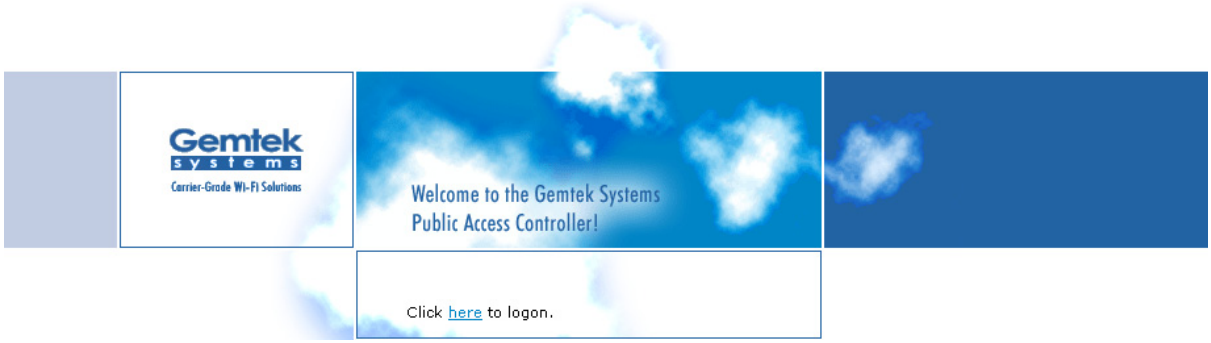


Step 4 Click the **upload** button to upload specified templates and files.

You do not need to upload all additional files at once. You can repeat the upload process a number of times until all necessary images are uploaded.

Step 5 Check for the newly uploaded user pages and images to ensure that everything is uploaded and displayed correctly. Go to the link:

`https://<device-IP-address>/` to get to the new user **welcome** page:



Click the **here** link or enter the link directly:

`https://<device-IP-address>/login.user` to get to the new user **login** page:

If at anytime you wish to restore the factory default user pages, click the **reset** button under the **system | reset** menu.

Extended UAM

The **Extensions** feature (**user interface | configuration** menu) allows an external Web Application Server (WAS) to intercept/take part in the user authentication process externally log on and log off the user as necessary. It provides means to query user session information as well.

See the following schemes to understand how the remote client authentication works.

Scheme 1:

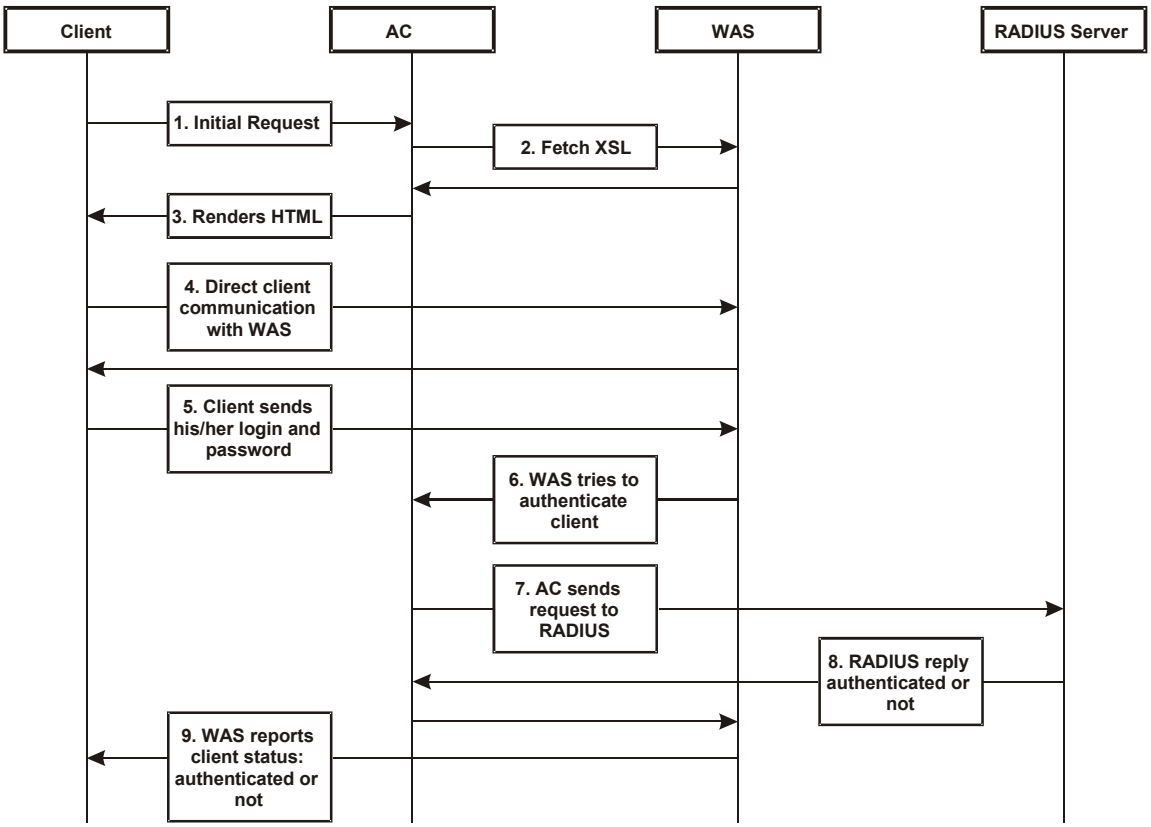


Figure 15 – Client Remote Authentication Scheme (1)

Client initiates (1) authentication process. AC intercepts any access to the Internet via HTTP and redirects the client to the **welcome**, or **login** URL on AC. In order to render the custom login screen HTML page, the AC must be configured to (2) fetch .XSL script from a remote server, which in this case is a Web Application Server (WAS), or have custom .XSL uploaded on the AC. There is the ability to enable caching of .XSL scripts (see: **User Interface | Configuration | Pages**), thus avoiding fetching of the same document every time a client requests authentication.

The AC (3) uses .XSL script to render HTML output, which is done by feeding a XML document to a parsed and prepared for rendering .XSL script. The latter XML document contains all needed information for Web Application Server like user name, password (if there was entered), user IP address, MAC address and NAS-Id. Custom .XSL script must generate initial welcome/login screen so that it embeds all the needed information in a HTML FORM element as hidden elements and POST data not back to the AC, but to the Web Application Server (5). Thereafter the client communicates directly with the Web Application Server.

Find more details on how to prepare the .XSL templates to renter the HTML in Appendix: **G) User Pages Templates Syntax.**

When the Web Application server has all needed data from the client, it must try to authenticate (6) the client. Authentication is done by the RADIUS server but through the AC. At this step the **shared secret** is used to make the connection between the WAS and the AC. The AC re-sends the authentication request to the RADIUS server (7). Depending on the status, appropriate authentication status must be returned back to the WAS but through the AC (8). In step (9), the Web Application Server knows the client authentication status and reports success or failure back to the client.

The Web Application Server (WAS) must be configured as a free site in the Walled Garden area.

There is an ability to skip the rendering initial user pages from the .XSL. See the following scheme when the user initial request is redirected to the specified location.

Scheme 2:

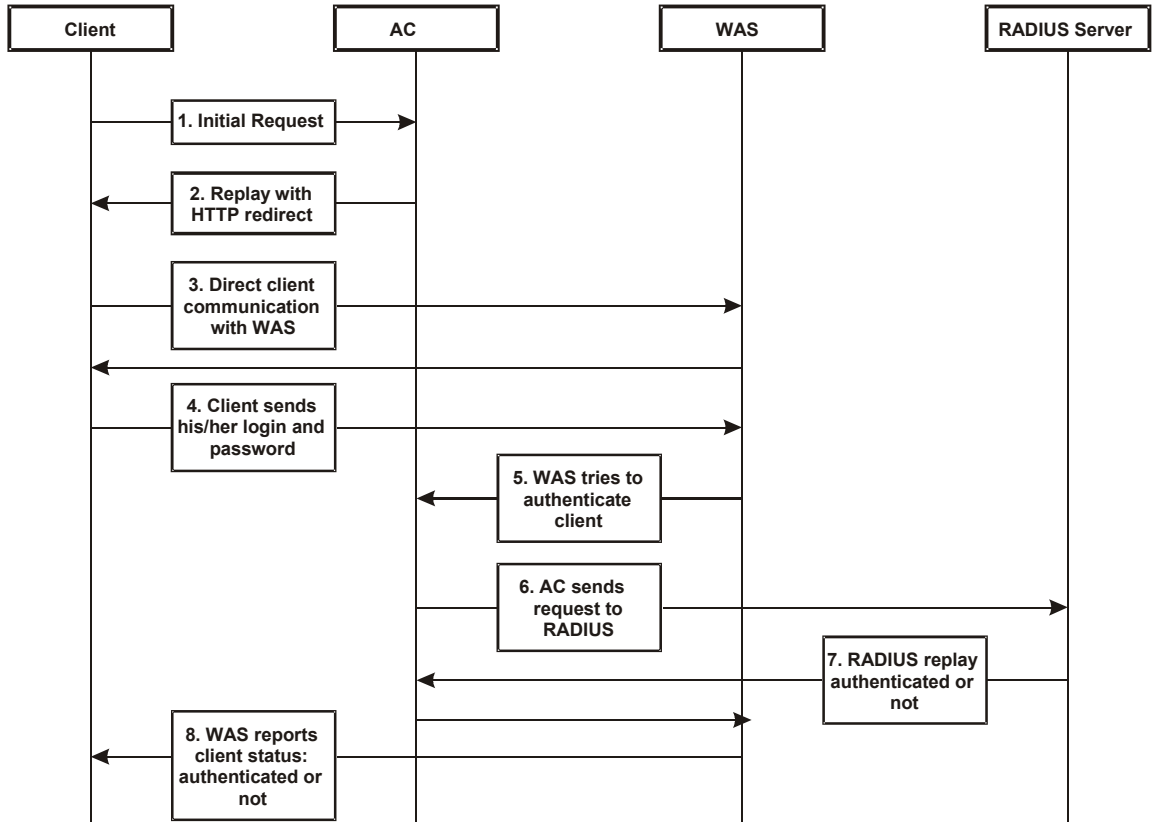


Figure 16 – Client Remote Authentication Scheme (2)

The initial client request (1) can be redirected to the specified location, as **redirection URL** on the Web Application server. In such case the client who wants to authenticate gets the redirection from AC (2). In other words the AC intercepts any access to the Internet via HTTP and redirects the client to the defined **welcome**, or **login** URL on WAS (also see: **User Interface | Configuration | Pages**). The further actions are the same as described in the **Scheme 1** (*Figure 15 – Client Remote Authentication Scheme (1)*).

The WAS location URL under welcome page redirect must be configured as a free site in the Walled Garden area.

To define such redirection URL use the **user interface | configuration | pages** menu. Enable **welcome** page, set the **redirect** setting and specify the redirect location for such authentication process (also see: **User Interface | Configuration | Pages**).

Parameters Sent to WAS

Parameters that are sent to the WAS for user authentication pages redirection:

parameter	description
nasid	NAS server ID value. Can be changed or specified under the **network interface | RADIUS | RADIUS settings** menu
nasip	P-560 WAN IP address. Can be changed or specified under the **network interface | configuration | interface configuration** menu.
cientip	Client IP address. Cannot be defined manually.
mac	Client MAC address. Cannot be defined manually.
ourl	Initial URL where not authorized client enter to his/her browser and tries to browse. After authentication the user is redirected in this URL (optional).
sslport	HTTPS port number of AC (by default: 443). Not configurable.
lang	Parameter "accept-language" from client browser request (optional).

In order to logon, log-off or get user status WAS submits POST request to the following URLs:

1. Remote user logon

- Script name: pplogon.user
- Parameters (all parameters are required):
  - secret shared secret, to protect page from accidental use
  - ip IP address of user to be logged on.
  - username Username of the user to be logged on.
  - password Password of the user to be logged on.

Script call example:

```
https://P560/pplogon.user?secret=sharedSecret&ip=<user_IP_address>&username
=userName&password=UserPassword
```

Script produces XML output:

```
<logon>
<status>Ok</status>
<error>0</error>
<description>User logged on.</description>
<replymessage>Hello user!</replymessage>
</logon>
```

Response status and error codes:

status	error	description
OK	0	User is logged on.
Not checked	100	Logon information not checked.
No IP	101	No user IP address supplied.
No username	102	No username supplied.
Disabled	103	Remote authentication is disabled.
Bad secret	104	Incorrect shared secret supplied.
No password	105	No user password.
OK	110	User already logged on.
Failed to authorize	111	Failed to authorize user.
Bad password	112	Incorrect username or/and password.

Network failed	113	Network connection failed.
Accounting error	114	Accounting error.
Too many users	115	Too many users connected.
Unknown authorization error	120	Unknown authorization error.

`<replymessage>` is RADIUS Reply-Message attribute value. If RADIUS responds with Reply-Message(s), they are added to logon response. If RADIUS does not responds with Reply-Message, <replymessage> attribute is not added to output XML.

See the Appendix: **E) Standard RADIUS Attributes** for all supported RADIUS attributes.

2. Remote user log-off

- Script name: pplogoff.user
- Parameters:
  - secret shared secret, to protect page from accidental use
  - ip IP address of user to be logged off.
  - username Username of the user to be logged off.
  - mac AC address of the user to be logged off.

All parameters are required, except the IP and MAC. At least one of IP and MAC addresses should be supplied. If supplied only IP, user is checked and logged off by username and IP. If IP and MAC addresses are supplied, then user is checked and logged off by username, IP and MAC addresses.

Script call example:

```
https://P560/pplogoff.user?secret=sharedSecret&username=UserName&ip=<user_IP_address>
```

Script produces XML output:

```
<logoff>
<status>Ok</status>
<error>0</error>
<description>User logged off.</description>
</logoff>
```

Response statuses and error codes:

status	error	Description
OK	0	User is logged off.
Not checked	100	Logoff information not checked.
No username	102	No username supplied.
Disabled	103	Remote authentication is disabled.
Bad secret	104	Incorrect shared secret supplied.
No IP/MAC	106	No user IP and/or MAC address supplied.
No user by MAC	121	User with supplied MAC address not found.
No user by IP	122	User with supplied IP address and username not found.
No user by IP and MAC	123	User with supplied IP, MAC addresses and username not found.

Failed to logoff	131	Failed to logoff user.
Cannot resolve IP	132	Cannot resolve user IP.
Unknown logoff error	140	Unknown logoff error.

3. Remote user status

- Script name: ppstatus.user
- Parameters:
  - secret shared secret, to protect page from accidental use
  - ip IP address of user to get status.
  - username Username of the user to get status.

All parameters are required.

Script call example:

```
https://P560/ppstatus.user?secret=sharedSecret&username=UserName&ip=<user_IP_address>
```

Script produces XML output:

- XML output, when some error occurs:

```
<ppstatus>
  <status>No user by IP</status>
  <error>122</error>
  <description>User with supplied IP address not found.</description>
</ppstatus>
```

Response statuses and error codes:

status	error	description
OK	0	User status is ok.
Not checked	100	Status information not checked.
No IP	101	No user IP address supplied.
No username	102	No username supplied.
Disabled	103	Remote authentication is disabled.
Bad secret	104	Incorrect shared secret supplied
No user by IP	122	User with supplied IP address not found.
No user by IP and username	141	User with supplied IP address and username not found.

- XML output when no errors and user statistics got successfully:

```
<ppstatus>
  <status>Ok</status>
  <error>0</error>
  <description>Got user status.</description>
  <entry id="1">g17</entry>
  <entry id="2">192.168.2.117</entry>
  <entry id="3">200347C92B63</entry>
  <entry id="4">00:00:05</entry>
```

```
  <entry id="5">3E64C7967A36</entry>
  <entry id="6">00:01:10</entry>
  <entry id="7">0 bytes</entry>
  <entry id="8">0 bytes</entry>
  <entry id="9">testlab</entry>
  <entry id="10">unlimited</entry>
  <entry id="11">unlimited</entry>
  <entry id="12">unlimited</entry>
  <entry id="13">32 Mbps</entry>
  <entry id="14">32 Mbps</entry>
  <entry id="15">04:59:55</entry>
  <entry id="16">EAP</entry>
</ppstatus>
```

Status detailed information by ID:

id	description
1	User name
2	User IP address
3	User MAC address
4	Session time
5	Session ID
6	User idle time
7	Output bytes
8	Input bytes
9	User WISP name
10	Remaining bytes
11	Remaining output bytes
12	Remaining input bytes
13	Bandwidth upstream
14	Bandwidth downstream
15	Remaining session time
16	Authentication method

Chapter 5 – Command Line Interface

Introduction

The CLI (Command Line Interface) software is a configuration shell for the Access Controller. Using the CLI system operator can configure:

- **User interface**
- **Network interface**
- **Wireless interface**
- **System**

Using the CLI system operator can check:

- **Status (device, network, service)**
- **Connection**

All available key combinations in CLI mode are listed in the table below:

Key and/or Combination	Function
?	Get context-sensitive help
<TAB>	Complete the current keyword or list all the options
<CTRL> <D>	Break out the sub-shell
<CTRL> <A>	Jump to the beginning of the line
<CTRL> <E>	Jump to the end of the line
<CursUP>/<CursDOWN>	Scroll through the history of commands

Figure 17 – Key Combinations in the CLI

Get Connection to CLI

There are three different ways to get a connection to the CLI of the Access Controller, via the:

- **Telnet**
- **SSH client**

Telnet Connection

Make sure that **default access status** is allowed and **telnet** function is enabled on the AC before trying to connect via **telnet**. Otherwise, no **telnet** connection will be available.

Connect the Access Controller via LAN or WAN ports using the enclosed UTP cable and start a telnet session (using a telnet application). For example, connect your device via the WAN port, and then make a telnet connection as the following:

```
telnet 192.168.2.66
```

where 192.168.2.66 is the default WAN interface IP. Login to CLI mode and the prompt will be displayed automatically. Enter the administrator login settings (refer to the **Login** section for details).

SSH Connection

Make sure that **default access status** is enabled on the AC before attempting to connect via **SSH**. Otherwise no **SSH** connection will be available.

Connect the Access Controller via LAN or WAN ports using the enclosed UTP cable and start a SSH session (using an application as PuTTY). For example connect your device via the WAN port and then make a SSH connection to host IP: 192.168.2.66 (default WAN interface IP).

Login to CLI mode prompt will be displayed automatically. Enter the administrator login settings (refer to the next section for details).

Login

Enter the administrator login settings in the displayed CLI command prompt.

The default administrator login settings:

Login: **admin**

Password: **admin01**

```
P560 login: admin
Password:
Press '?' for more information on available commands.
```

Figure 18 – CLI Login

After a successful login command prompt is displayed, the CLI is ready for commands. Press '?' to get a list of main commands:

```
connection: Device settings related to user's connection with device.
exit      : Exit command line interface.
network   : Device configuration settings affecting networking.
reboot    : Reboots the device.
reset     : Resets configuration to defaults and reboots the device.
shell     : Starts the shell.
status    : Device status information commands.
system    : System configuration.
telnet    : Runs telnet client.
user      : Device configuration settings affecting user's interface.
wireless  : Wireless card configuration settings.
```

Figure 19 – Main CLI Commands

'**?**' will not appear on the screen. While pressing this character, the display changes to the desired help page. To enter '**?**' as character type '**\?**'.

Connection

Connection is a category of command that is related to the user's connection with the device.

A full list of all available **connection** commands/subcommands and its parameters is available in the Appendix section: **D) CLI Commands and Parameters.**

In general, connection usage is as follows:

```
connection <command> <value>
```

To get a list of all available commands in the connection category type:

```
connection ?
```

```
>connection

Device settings related to user's connection with device.
email      : Outgoing Main (SMTP) Redirection settings.
supervision: Settings for station availability monitoring with ARP-Pings.
```

Figure 20 – Connection Commands

Network

Network is a category of commands that configures controller interface settings, DNS, DHCP, UAT and RADIUS settings.

A full list of all available **network** commands/subcommands and its parameters is available in the Appendix section **D) CLI Commands and Parameters.**

The **network** commands themselves contain several subcommands and the subcommands again contain several parameters. In general, **network** command usage is as follows:

```
network <command> <subcommand1> <subcommand2> [-parameter] <value>
```

To get a list of all available commands in the configure category, type:

```
network ?
```

```
>network

Device configuration settings affecting networking.
configuration: Device configuration.
dhcp         : Dynamic Host Configuration Protocol services configuration.
dns          : DNS Server settings.
radius       : Configuration set for changing RADIUS Server settings.
tunnels      : Tunnels configuration commands.
```

Figure 21 – Network Commands List

To get a list of all-available subcommands for a specific command, type:

```
network <command> ?, (e.g. network radius ?)
```

All available subcommands for radius are displayed:

```
>network radius

Configuration set for changing RADIUS Server settings.
accounting_log: For sending RADIUS accounting via syslog.
proxy         : RADIUS Proxy configuration.
servers       : Up to 32 different RADIUS servers' configuration.
settings      : General RADIUS settings configuration.
wisp          : WISP information and setup.
```

Figure 22 – Configure Network (1)

Specific command contains several subcommands:

```
network <command> <subcommand1> ?, (e.g. network radius servers ?)
```

All available subcommands are displayed:

```
>network radius servers

Up to 32 different RADIUS servers' configuration.
accounting    : Accounting RADIUS servers' configuration.
authentication: Authentication RADIUS servers' configuration.
backup        : Accounting information backup servers configuration.
```

Figure 23 – Configure Network (2)

To get a list for available parameters on selected subcommand, type:

`network <command> <subcommand1> <subcommand2> ?, (e.g. network radius servers accounting ?)`

All available parameters on entered subcommand are displayed:

```
>network radius servers accounting

Accounting RADIUS servers' configuration.
<id>           : RADIUS server id.
-a <ip_address>: RADIUS server IP address used for Radius accounting.
-p <port>      : RADIUS server port used for Radius accounting.
-s <secret>    : Shared secret key for accounting(must be the same on RADIUS ser
ver and RADIUS client).
```

Figure 24 – Configure Network (3)

To configure the desired controller interface setting, type all required parameters with values and subcommands:

`network <command> <subcommand1> <subcommand2> [-parameter] <value>`

`(e.g. network radius servers accounting 1 –a 127.0.0.2 –p 1814 –s testing111),` where parameters are as follows:

-a – RADIUS server IP address used for RADIUS accounting

-p – RADIUS server port number used for RADIUS accounting

-s – Shared secret key for accounting.

```
>network radius servers accounting 1 –a 127.0.0.2 –p 1814 –s testing111
Command completed successfully.
```

Figure 25 – Configure Network (4)

If successful, a message regarding the successful completion is displayed; otherwise, an error message is displayed.

In some cases, entered commands without parameters display current controller configuration or settings:

`network <command> <subcommad1> <subcommad2>, (e.g. radius servers accounting),` displays available RADIUS servers and its settings list (in this case, the RADIUS accounting server which is already updated):

```
>network radius servers accounting
Id Name       Address         Port  Shared Secret Key
1  LOCAL      127.0.0.2       1814  testing111
2  REMOTE     192.168.2.162   1813  testing123
```

Figure 26 – Configure Network (5)

Wireless

Wireless is a category of commands that configures controller basic and advanced wireless interface settings, access control list (ACL) and WDS.

A full list of all available **wireless** commands/subcommands and its parameters is available in the Appendix section: **D) CLI Commands and Parameters.**

The **wireless** commands themselves contain several subcommands and the subcommands again contain several parameters. In general, **wireless** command usage is as follows:

`wireless <command> <subcommand1> [-parameter] <value>`

To get a list of all available commands in the configure category, type:

`wireless ?`

```
>wireless

Wireless card configuration settings.
acl     : Static ACL configuration.
advanced: Advanced wireless settings.
basic   : Basic wireless settings.
security: Wireless security configuration.
wds     : Wireless Distribution System (WDS) configuration.
```

Figure 27 –Wireless Commands List

To get a list of all-available subcommands for a specific command, type:

`wireless <command> ?, (e.g. wireless basic ?)`

All available subcommands for radius are displayed:

```
>wireless basic

Basic wireless settings.
-s <ssid>    : SSID name.
-d <domain>  : Regulatory domain name.
-l           : Print available regulatory domains.
-m <mode>    : Wireless network mode: b_only, b_wifi, mixed_wifi, mixed, mixed_g_wifi,
 g_wifi.
-c <channel> : Channel selection.
-a           : Print available channels for current regulatory domain.
```

Figure 28 – Configure Wireless Basic

To configure the desired controller interface setting, type all required parameters with values and subcommands. Use the samples from previous section.

User

User is a category of commands that configures controller interface settings, affecting the user's interface: redirection URL, free sites (walled garden), system management access, administrator login/password.

A full list of all available **user** commands/subcommands and their parameters is available in the Appendix section: **D) CLI Commands and Parameters.**

In general, the **user** command usage is as follows:

`user <command> <subcommand1> <subcommand2> [-parameter] <value>`

To get the full list of the **user** commands, type:

`user ?`

```
>user

Device configuration settings affecting user's interface.
administrator: Administrator login and password change.
connected    : Connected users list.
oneclick     : One click roaming configuration.
start_page   : Definition of first URL after user login.
walled_garden: Free Web sites list.
webproxy     : Web proxy configuration.
```

Figure 29 – User Commands List

To get a list of all-available subcommands for a specific command, type:

`user <command> ?, (e.g. user walled_garden ?)`

All available subcommands for walled garden (free sites) are displayed:

```
>user walled_garden

Free Web sites list.
host : Configures free web sites that are not displayed to users.
url  : Configure free web sites that are displayed to users.
```

Figure 30 – Configure User Interface (1)

To configure selected user interface settings, type:

`User <command> <subcommand1> <subcommand2> [-parameter] <value>,`

`(e.g. user walled_garden url A -u www.gemtek.system.com -s gemtek system site),` where parameters are as follows:

A – action: add URL

-u – define URL address

-s – define URL description, visible for user:

```
>user walled_garden url A -u www.gemtek.system.com -s gemtek system site
Command completed successfully.
>
```

Figure 31 – Configure User Interface (2)

If successful, a message regarding the successful completion is displayed; otherwise, an error message is displayed.

Status

Status is a category of commands that's displays:

- General **devices** status (model, firmware version, uptime, memory)
- All interface **network** settings (IP address/netmask, MAC address, gateway, RX/TX statistics)
- Currently running **services** (DHCP, routes, port forward, telnet, SNMP, UAT, ..).

A full list of all available **status** commands/subcommands and their parameters is available in the Appendix section: **D) CLI Commands and Parameters.**

In general the **status** command usage is as follows:

```
Status  <command>
```

To get the full list of the **status** commands, type:

```
status ?
```

```
>status

Device status information commands.
device : General system information.
network: Network information.
service: Services information.
```

Figure 32 – System Status Commands List

To get the general device status information, type:

```
status device :
```

```
>status device
Device name     : Gemtek Systems, 54Mb Hotspot-in-a-Box, model: P-560
Firmware version: P560.GSI.2.20.0411.11271543
Uptime          : 00:21:57
Software runtime: 00:21:41
Total memory    : 30904 kB
Free memory     : 936 kB
Average load    :
1min:             1.18
5min:             1.10
15min:            0.81
```

Figure 33 – Device Status

Here you can find the current firmware **version** of your AC. This is important information for support requests and for preparing firmware uploads.

System

System is a category of commands that configures access to controller (telnet, AAA methods, L2 isolation, SNMP, UAT) and configuration: clock, NTP, syslog, trace.

A list of all available **system** commands/subcommands and their parameters are available in the Appendix section: **D) CLI Commands and Parameters.**

In general, the **system** command usage is as follows:

```
system <command> <subcommand1> <subcommand2> [-parameter] <value>
```

To get the full list of the **system** commands, type:

```
system ?
```

```
>system

System configuration.
access       : System access configuration.
configuration: System configuration.
```

Figure 34 – System Commands List

Telnet

To make a telnet connection, type the **telnet** command in the command line:

```
telnet
```

```
>telnet

Starts telnet client.

>telnet
telnet>
```

Figure 35 – Telnet Command

The telnet client is activated and ready for a telnet session.

```
>telnet
telnet> open 192.168.2.88
Trying 192.168.2.88...
Connected to 192.168.2.88.
Escape character is '^]'.
```

Figure 36 – Telnet Session

Quit the telnet to return to CLI interface.

Reboot

To stop the controller and reboot the device, type the **reboot** command in the command line. No configuration changes are done. The last saved configuration is applied to the rebooted controller.

Reset

To reset the controller to factory defaults, type the **reset** command. The device is restarted and defaults values are set.

Please note, that even the administrator password will be set back to the factory default. Refer to Appendix section: **B) Factory Defaults for the Access Controller**.

Exit

To leave the **CLI** mode, type the **Exit** command in the command line.

Chapter 6 – SNMP Management

Introduction

Another way to configure and monitor the Access Controller (P-560) via a TCP/IP network is **SNMP** (Simple Network Management Protocol).

SNMP is an application layer protocol that facilitates the exchange of management information between network devices. It is part of the Transmission Control Protocol/Internet Protocol (TCP/IP) protocol suite. SNMP enables network administrators to manage network performance, find and solve network problems, and plan for network growth.

The SNMP agent and management information base (MIB) reside on the Access Controller. To configure SNMP on the controller, you define the relationship between the Network Management System (NMS) and the SNMP agent (our AC). The SNMP agent contains MIB and **Gemtek Systems private MIB** variables whose values the SNMP manager can request or change. A NMS can get a value from an agent or store a value into the agent. The agent gathers data from the MIB, the repository for information about device parameters and network data. The agent can also respond to a manager's requests to get or set data.

In order to manage the device you have to provide your Network Management System software with adequate MIB files. Please consult your management software manuals on how to do that.

SNMP Versions

Access Controller supports the following versions of SNMP:

- **SNMPv1**—The Simple Network Management Protocol: A Full Internet Standard, defined in RFC 1157. (RFC 1157 replaces the earlier versions that were published as RFC 1067 and RFC 1098.) Security is based on community strings.

- **SNMPv2c**—The community-string based Administrative Framework for SNMPv2. SNMPv2c (the "C" stands for "community") is an Experimental Internet Protocol defined in RFC 1901, RFC 1905, and RFC 1906. SNMPv2c is an update of the protocol operations and data types of SNMPv2p (SNMPv2 Classic), and uses the community-based security model of SNMPv1.

- **SNMPv3 –** SNMP v3 is based on version 2 with added security features. It addresses security requirements through encryption, authentication, and access control rules.

Both SNMPv1 and SNMPv2c use a community-based form of security. The community of managers able to access the agent's MIB is defined by an IP address access control list and password.

The Access Controller implementation of SNMP supports all MIB II variables (as described in RFC 1213) and defines all traps using the guidelines described in RFC 1215.The traps described in this RFC are:

coldStart

A coldStart trap signifies that the SNMP entity, acting in an agent role, is reinitializing itself and that its configuration may have been altered.

WarmStart

A WarmStart trap signifies that the SNMP entity, acting in an agent role, is reinitializing itself

and that its configuration is unaltered.

authenticationFailure

An authenticationFailure trap signifies that the SNMP entity, acting in an agent role, has received a protocol message that is not properly authenticated.

linkDown

A linkDown trap signifies that the SNMP entity, acting in an agent role, recognizes a failure in one of the communication links represented in the agent's configuration.

linkUp

A linkUp trap signifies that the SNMP entity, acting in an agent role, recognizes that one of the communication links represented in the agent's configuration has come up.

SNMP Agent

The SNMP agent responds to SNMP manager requests as follows:

- Get a MIB variable—The SNMP agent begins this function in response to a request from the SNMP manager. The agent retrieves the value of the requested MIB variable and responds to the manager with that value.
- Set a MIB variable—The SNMP agent begins this function in response to a message from the SNMP manager. The SNMP agent changes the value of the MIB variable to the value requested by the manager.

The SNMP agent also sends unsolicited trap messages to notify an SNMP manager that a significant event has occurred (e.g. authentication failures) on the agent.

SNMP Community Strings

SNMP community strings authenticate access to MIB objects and function as embedded passwords. In order for the SNMP manager to access the controller, the community string must match one of the two community string definitions on the controller. A community string can be as follows:

- Read-only—Gives read access to authorized management stations to all objects in the MIB except the community strings, but does not allow write access.
- Read-write—Gives read and write access to authorized management stations to all objects in the MIB, but does not allow access to the community strings.

Use SNMP to Access MIB

As shown in the picture *Figure 37 – SNMP Network* SNMP agent gathers data from the MIB. The agent can send traps (notification of certain events) to the SNMP manager, which receives and processes the traps. Traps are messages alerting the SNMP manager to a condition on the network such as improper user authentication, restarts, link status (up or down), MAC address tracking, and so forth. The SNMP agent also responds to MIB-related queries sent by the SNMP manager in *get-request*, *get-next-request*, and *set-request* format.

Figure 37 – SNMP Network

Gemtek Private MIB

In addition to standard SNMP MIBs, Gemtek P560 supports **private Gemtek MIB**. The private MIBs are enterprise specific and serve to extend the functionality of the standard MIBs. Private MIB identifies manageable objects and their properties that are specific to the managed device. MIBs let you manage device not only by using WEB or Command Line Interface but also using SNMP protocol. The descriptions and brief explanations of managed objects are available in the MIB file. The MIB file is a specially formatted text file. It is using the so-called ASN.1 standard syntax.

Chapter 7 – Reference Manual

This chapter contains Hotspot-in-a-Box web management reference information.

The **web management** main menu consists of the following sub menus:

- **Network Interface** – device configuration settings affecting networking.
- **User Interface** – device configuration settings affecting the user interface.
- **System** – device system configuration settings directly applicable to the controller.
- **Connection**– device settings related to user's connection with the P560.
- **Exit** – click exit and leave the web management then close your web-browser window.

Web Interface

The main **web management** menu is displayed at the top of the page after successfully logging into the system (see the figure below). From this menu all essential configuration pages are accessed.

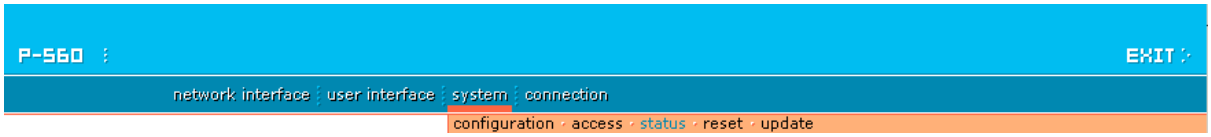


Figure 38 – Main Configuration Management Menu

By default the **system | status** menu is activated and the current AC system status is displayed. The active menu is displayed in a different color.

The **web management** menu has the following structure:

Network Interface

Configuration – configuration page for all controller network interfaces
- **Interface configuration** – network interfaces configuration
- **VLAN** – define VLAN on your controller
- **Route** – define new static route on the controller interface
- **Port forwarding** – port-forwarding rules
- **Management subnet** – access points (APs) management

DNS – define DNS server settings

DHCP – Dynamic Host Configuration Protocol services configuration

RADIUS – configuration set for RADIUS servers, includes menu:
- **RADIUS settings** – NAS server ID, hotspot operator name and other settings
- **RADIUS servers** – accounting, authentication RADIUS servers IP, port and other settings
- **WISP** – add new WISP on the system.
- **Proxy –**configure the AC to act as RADIUS server proxy.
- **Accounting backup** – backup authentication logs in the remote or external server

Tunnels – set tunnels:
- **PPPoE/PPTP/GRE for DSL** – connect to ISP via the PPPoE, PPTP or GRE tunnel
- **PPTP client for VPN** – configure PPTP client for Virtual Private Networks
- **GRE client for VPN** –set the GRE (Generic Routing Encapsulation) tunnel for the P560

Wireless – wireless interface configuration
- **Basic –** SSID, regulatory domain, WEP keys
- **Advanced –** channel selection, layer 2 client isolation and other settings
- **Security –** WEP and WPA
- **ACL –**access control default policy, static ACL, access control by MAC address
- **WDS** – access point and WDS modes

User Interface

Configuration –Welcome/Login/Logout/Help page customization

Pages – configure and upload user pages
Upload – upload new internal user pages
Headers – define http headers encoding and language
Remote Authentication – allow external Web Application Server intercept/take part in user authentication process
One Click – configure One Click roaming

Administrator – administrator login and password change
Start page – define start page URL
Walled Garden – free web site list
Web Proxy – web proxy settings for clients

System

Configuration – system configuration utilities:
Syslog – specify address where to send system log file
Trace system – trace such controller services as PPTP and PPPoE
Clock – system clock settings
NTP – get time from network time protocol service
Certificate– upload new certificates into the local controller memory
Save and restore – save current device configuration for backup
Pronto - Pronto compatibility agent configuration

Access – configure access to your controller:
Access Control – set default access to your AC
Telnet – enable/disable telnet connections
AAA – define different AAA methods
UAT – enable/disable universal address translation
Isolation – restricts clients from communicating along Level 2 separation
NAV – NAT, authentication and visitor access control
SNMP – SNMP service and proxies

Status – AC system status
Reset – reset configuration to factory defaults values and/or reboot
Update – find out current software version and update with new firmware

Connection

Users – connected users' statistics list and log-out user function
E-Mail Redirection – outgoing mail (SMTP) redirection settings
Station Supervision – monitor station availability with ARP-pings settings

In the following sections, short references for all menu items are presented.

Network Interface

Network Interface | Configuration | Interface Configuration

The interfaces eth0 and ixp0 on 2.21 firmware are bridged therefore they will be displayed as one eth0. The screen shots in this manual will not match with ones on your device.

The Hotspot-in-a-Box contains up to three multi-purpose network interfaces: eth0, ixp0 and ixp1.

These interfaces can be configured to work as either local area network (LAN) or wide area network (WAN) interfaces for Access Points. LAN is used to connect hubs, switches, Access Points and subscribers. The WAN port connects to the Internet or the service provider's backbone network.

All these interfaces are listed in the **interface configuration** page. All network interfaces available in the Hotspot-in-a-Box are shown in the following table:

interface configuration

interface	status	type	IP address	netmask	gateway	action
eth0	enabled	LAN	192.168.100.1	255.255.255.0	ixp1	edit
ixp0	enabled	LAN	192.168.3.1	255.255.255.0	ixp1	edit
ixp1	enabled	WAN	192.168.2.29	255.255.255.0	*192.168.2.1	edit

Figure 39 – Interface Configuration Table

To change network interface configuration properties click the **edit** button in the **action** column. The **status** can be changed now:

interface configuration

interface	status	type	IP address	netmask	gateway	action
eth0	enabled	LAN	192.168.100.1	255.255.255.0	ixp1	
ixp0	enabled	LAN	192.168.3.1	255.255.255.0	ixp1	continue cancel
ixp1	enabled	WAN	192.168.2.29	255.255.255.0	*192.168.2.1	

Figure 40 – Edit Interface Configuration Settings part.1

Interface - standard interface name. This name cannot be edited and is assigned by the operating system during startup. Interface name cannot be changed because the hardware drivers define it.

Status – select the status of interface: [enabled/disabled].

Do not disable the interface through which you are connected to the P-560. Disabling such interface will lose your connection to the device.

Type – network type cannot be changed. There are two possible networking types:

LAN – interface is used as local area network (LAN) gateway, and is connected to a LAN;
WAN – interface is used to access the ISP network;

Change **status** or leave in the default state if no editing is necessary and click the **continue** button. Then the following parameters can be changed:

interface configuration

interface	status	type	IP address	netmask	gateway	action
eth0	enabled	LAN	192.168.100.1	255.255.255.0	ixp1	
ixp0	enabled	LAN	192.168.4.1	255.255.255.0	ixp1	update cancel
ixp1	enabled	WAN	192.168.2.29	255.255.255.0	*192.168.2.1	

Figure 41 – Edit Interface Configuration Settings part.2

IP Address – specify new interface IP address [in digits and dots notation, e.g. 192.168.5.1].

IP address of each interface should be from a different subnet; otherwise, you will receive an error message.

Netmask – specify the subnet mask [[0-255].[0-255].[0-255].[0-255]].These numbers are a binary mask of the IP address, which defines IP address order and the number of IP addresses in the subnet.

Gateway – interface gateway. For LAN type interfaces, the gateway can only be defined as WAN interface gateway. The gateway of the WAN interface is usually the gateway router of the ISP or other WAN network. [Default gateway is marked with '*'].

Update – update old values with entered ones.

The DHCP server settings will be automatically adjusted to match the new network settings.

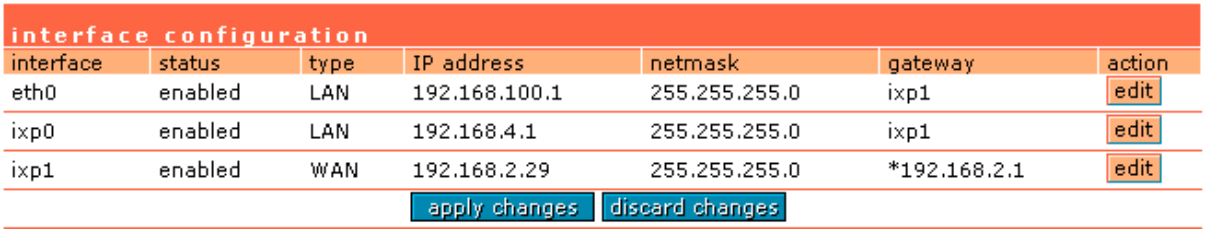


Figure 42 – Apply or Discard Interface Configuration Changes

Apply changes – to save all changes made in the **interface configuration** table at once.

Discard changes – restore all previous values.

For such general changes as interface settings change, the Hotspot-in-a-Box server needs to be restarted. Request for restart server appears:

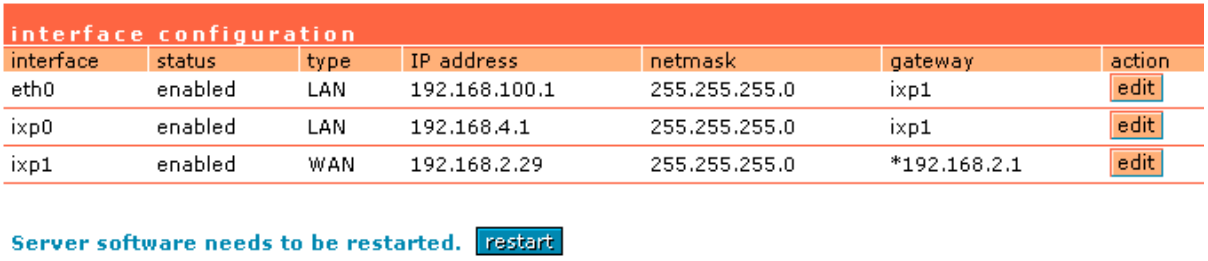


Figure 43 – Restart Server

Restart – Click the button to restart the server and apply the changes.

Network Interface | Configuration | VLAN

Up to **4094** VLANs can be created in the system.

Virtual Local Area Networks (**VLANs**) are logical groupings of network resources. You can create your own VLANs on your AC using the network **interface | configuration | VLAN** menu. By default no VLANS are defined on the system:

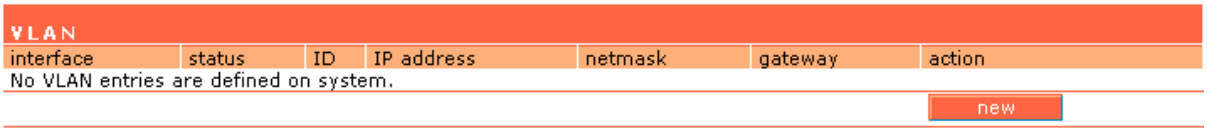


Figure 44 – VLAN

To create a VLAN on the AC click the new button and enter following parameters:

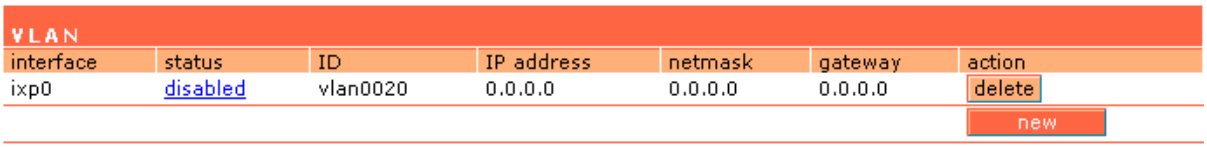


Figure 45 – Create New VLAN

Interface – select interface for your VLAN network [eth0/ixp0].

Status – non-editable, by default is disabled.

ID – assign ID for your VLAN network [1 to 4094]. Client devices that associate using the ID are grouped into this VLAN.

Other VLAN settings cannot be changed. Click on the **disabled** link to continue specifying settings for your VLAN. The network interface configuration page is opened and VLAN settings are ready for editing:

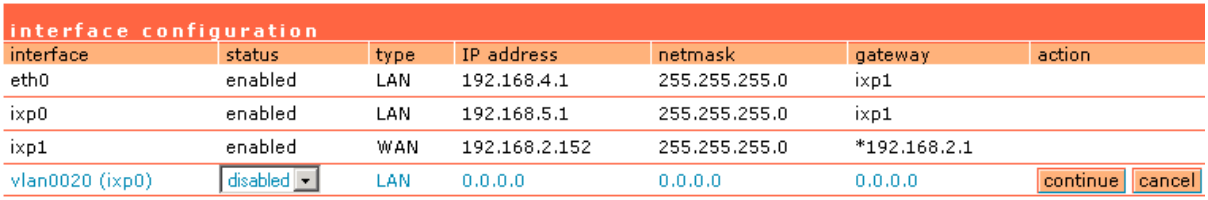


Figure 46 – Configure VLAN

Status – enable/disable your VLAN network. Select [enable] and click the **continue** button to configure the VLAN settings:

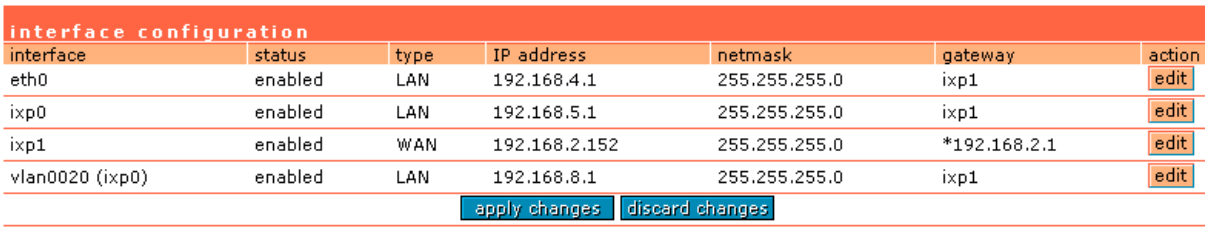


Figure 47 – Configure VLAN

Type – cannot be edited, depends on selected interface for VLAN [ixp0/eth0].

IP Address – enter the network address of your VLAN [format: digits and dots].

Netmask – enter the netmask for your VLAN network [format: digits and dots].

Gateway – select gateway for VLAN network [default: ixp1].

Click the **update** and **restart** and **apply changes** to save your new VLAN. Check the **interface | configuration | VLAN** menu for new created VLAN:

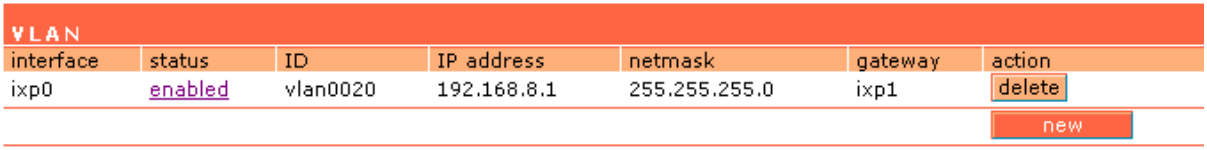


Figure 48 – Enable New VLAN

Network Interface | Configuration | Route

Under the **network interface | configuration | route** menu, static routes for the Ethernet interfaces can be set. By default no static routes are defined on the system:

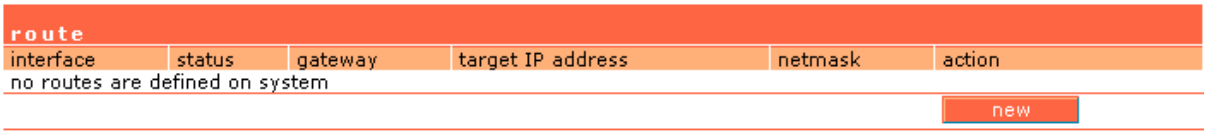


Figure 49 – Route

A routing rule is defined by the **target** subnet (target IP address and subnet mask), **interface** and/or **gateway** where to route the target traffic. A data packet that is directed to the **target** network is routed to the specified AC interface or to another gateway router. To add a new static route for the system, click the **new** button under the **action** column and specify the following parameters:

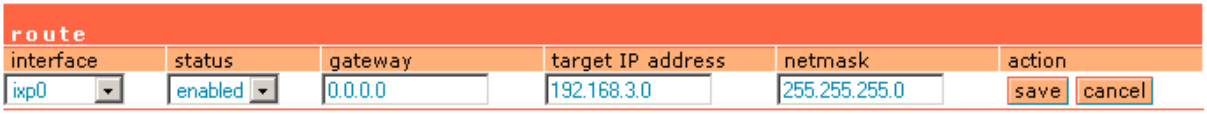


Figure 50 – Add New Route

Status – set new static route status: [enabled/disabled].

Interface – choose device interface for the route: [eth0/ixp0/ixp1/vlan[n]].

Gateway – enter the gateway address for the route. 0.0.0.0 stands for the default gateway of the selected interface [IP address].

Target IP Address – enter network address or host IP to be routed to [IP address].

Netmask – enter the target network netmask [dots and digits].

Save – save the new route.

Cancel – restore all previous values.

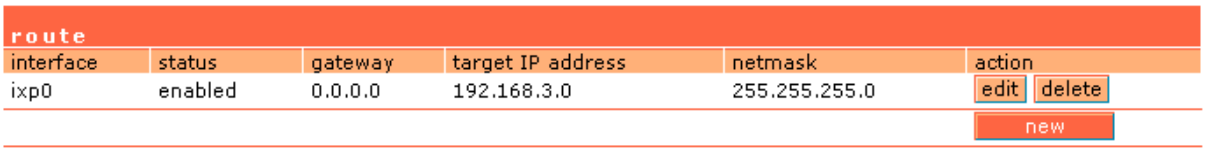


Figure 51 – Save New Route

Up to **255** static routes can be set between each interface.

Network Interface | Configuration | Port Forwarding

Port Forwarding is required when NAT is configured. NAT translates all internal addresses to one official IP address (WAN IP address). With port forwarding enabled it is possible to access internal services and workstations from the WAN interface.

Port forwarding forwards TCP or UDP traffic trough the P560 controller's local port to the specified remote port. Use the **network interface | configuration | port forwarding** menu to specify such a port forwarding rule. By default no port forwards are defined on the controller:

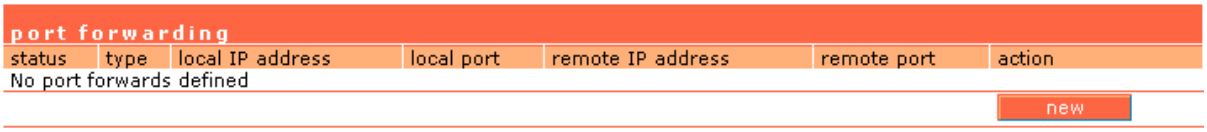


Figure 52 – Port Forwarding Rules

Click the new button to add a port-forwarding rule:

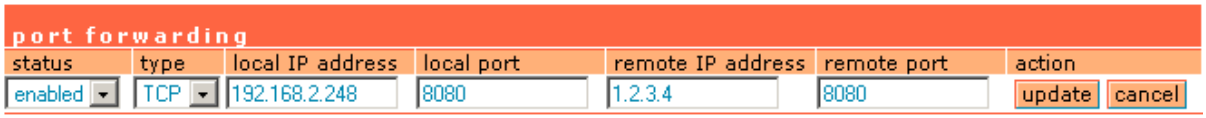


Figure 53 – Add Port Forwarding Rule.

Status – select status: [enabled/disabled].

Type – select type of forwarding traffic: [TCP/UDP].

Local IP Address – P560 device interface address from which the selected traffic should be forwarded.

Local Port – P560 device interface port from which the selected traffic should be forwarded.

Remote IP Address/Port – internal IP address and port no (LAN ports) to which the selected traffic shall be forwarded.

Example:

Create rule as follow:

Type = TCP, local IP address/port = 192.168.2.248:8080 remote IP address/port = 1.2.3.4:8080.

With such a rule all traffic coming to port 8080 on the P560 interface local address 192.168.2.248 will be forwarded to port 8080 on the server (host) 1.2.3.4.

Port forwarding is limited to **255** rules.

Network Interface | Configuration | Management Subnet

Each network interface can have a **management subnet**. Use the **network interface | configuration | management subnet** menu to configure this feature on selected interface.

When **management subnet** is enabled, **port forwarding will NOT WORK** when connecting from IP addresses that are in the management subnet's **remote** administrator's network. This is because the **management subnet** allows connecting to the client computer without using **port forwarding**.

The administrator can enable or disable management subnet for each interface. By default no management subnet is enabled on the controller:

management subnet

interface	status	IP address	netmask	remote network	remote netmask	action
eth0	disabled	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	edit
ixp0	disabled	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	edit
vlan0020	disabled	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	edit

Figure 54 – Management Subnet

To specify new subnet management click the **edit** button on the selected interface:

management subnet

interface	status	IP address	netmask	remote network	remote netmask	action
eth0	disabled	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	edit
ixp0	enabled	10.0.0.1	255.255.255.0	10.10.0.1	255.255.255.0	edit
vlan0020	disabled	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	edit

apply changes discard changes

Figure 55 – Add Management Subnet

IP Address and **Netmask** – specify the IP address and netmask of the management subnet. **IP address** will be set on the network interface as an alias, so you can connect to the P560 using this address. This IP address should be used on access points as the gateway address.

Remote Network and **Netmask** –specify the remote network that is allowed to access the local management subnet. Only addresses that are from the remote network will be accepted [dots and digits].

If you do not specify any remote network all stations with IP addresses from the management LAN are routed to the WAN port even without being authenticated.

Clients using an IP address from the management subnet can browse the Internet without authorization, and no accounting will be done. Thus, it is strongly recommended to allow traffic only from the administrative remote network (no 0.0.0.0/0.0.0.0 in remote specification).

Example:

Interface configuration for ixp0:

type:	LAN
IP address:	192.168.3.1
netmask:	255.255.255.0
gateway:	ixp1

Management subnet on ixp0:

IP address:	10.0.0.1
netmask:	255.255.255.0
remote network:	10.10.0.1
remote netmask:	255.255.255.0

With these settings applied, the administrator will be able to connect to devices behind the P560 on interface ixp0, if these devices use address in the range: 10.0.0.2 ... 10.0.0.254. The administrator is connecting via the Internet (from ixp1 interface).

The administrator's computer can have an address from 10.10.0.1 to 10.10.0.254.

The P560 interface eth0 has two IP addresses – 192.168.3.1 and 10.0.0.1.

Please note that devices which are using 10.0.0.2. – 10.0.0.254 addresses have access to the administrative network too!

In this example, the administrative network uses the reserved IP address (10.x.x.x) – they are not routed in the Internet, so the administrator should setup routers in a path between the P560 and the administrator's computer to recognize 10.x.x.x addresses and route them correctly. This is not comfortable and sometimes it is impossible. There is a solution – the administrator can use "PPTP client for VPN" (or GRE tunnel) (see: **Network Interface | Tunnels**) to setup a tunnel between the administrator's computer and the P560. The only addresses visible on the Internet will be the P560 WAN IP address and the administrator's computer (or router) IP address.

Network Interface | DNS

DNS (Domain Name Service) service allows AC subscribers to enter URLs instead of IP addresses into their browser to reach the desired web site.

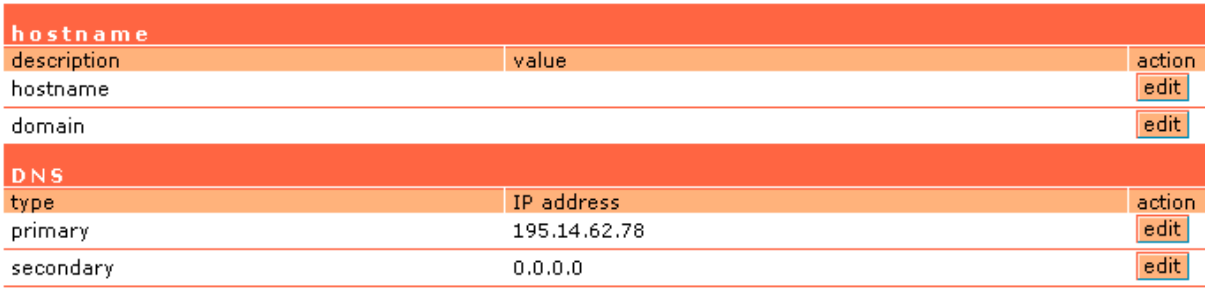


Figure 56 –- DNS Settings Configuration

To enter **hostname** and **domain** click the **edit** button in the **action** column and type required value:

Figure 57 – Hostname Settings

Hostname – specify the Hostname. By default hostname is not specified.

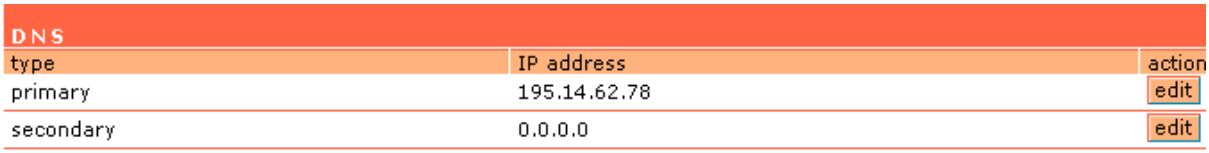
Domain – specify the Domain name. By default domain name is not specified.

Save – save modified settings.

When user is redirected to device welcome/login page, redirection will be done to:

- WAN-IP, if no hostname defined;
- hostname, if hostname defined, but domain empty;
- hostname.domain, if hostname and domain defined.

You can enter the **primary** and **secondary DNS** servers settings under the **network interface | DNS** menu:



DNS

type	IP address	action
primary	195.14.62.78	edit
secondary	0.0.0.0	edit

Figure 58 – DNS Redirection Settings

The **DNS server** or **DNS address** can be obtained dynamically if DHCP, PPPoE and/or PPTP (for DSL) service is enabled. To add **DNS** server manually click the **edit** button in the **action** column and type in the **DNS** server's IP address:

DNS

type	IP address	action
primary	195.14.62.78	
secondary	195.14.62.70	save cancel

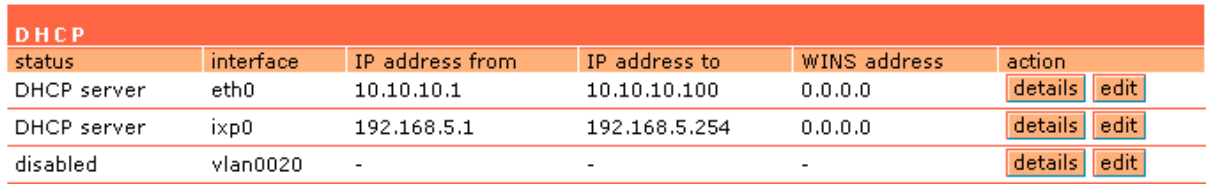
Figure 59 – Edit DNS Redirection Settings

IP address – enter the primary or secondary DNS server's IP address [in digits and dots notation].

Save – click to save the new DNS server's settings.

Network Interface | DHCP

The **P560** controller can act as a **DHCP server** and/or as a **DHCP relay gateway**. The **DHCP** (Dynamic Host Configuration Protocol) service is supported on the LAN interfaces [eth0/ixp0/vlan[n]]. This service enables clients on the LAN to request configuration information, such as an IP address, from a server. This service can be viewed in the following table:



DHCP

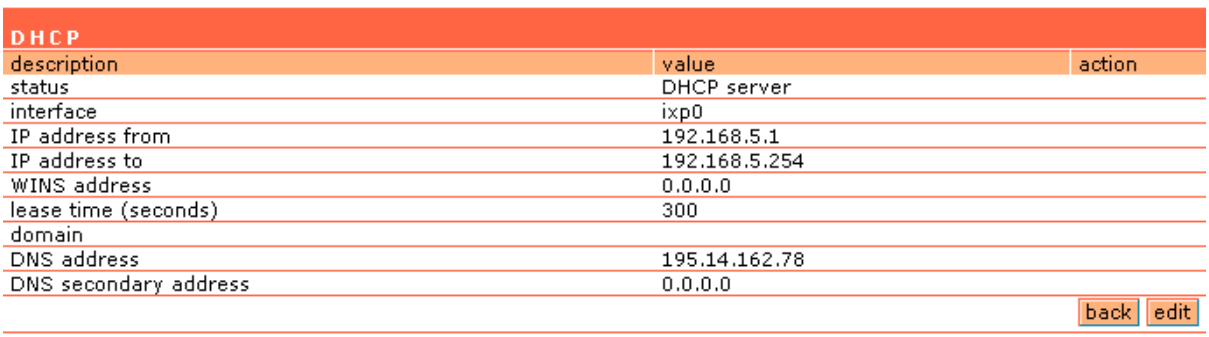
status	interface	IP address from	IP address to	WINS address	action
DHCP server	eth0	10.10.10.1	10.10.10.100	0.0.0.0	details edit
DHCP server	ixp0	192.168.5.1	192.168.5.254	0.0.0.0	details edit
disabled	vlan0020	-	-	-	details edit

Figure 60 – DHCP Configuration

By default the AC is configured to act as a **DHCP server**.

Each LAN interface runs a different instance of the **DHCP** service. This service is configured by defining an IP address range and WINS address for client workstations. Other settings, such as the default gateway and DNS server address are configured automatically according to the interface settings.

To see the complete **DHCP** service configuration, click the **details** button in the action column:



DHCP

description	value	action
status	DHCP server	
interface	ixp0	
IP address from	192.168.5.1	
IP address to	192.168.5.254	
WINS address	0.0.0.0	
lease time (seconds)	300	
domain		
DNS address	195.14.162.78	
DNS secondary address	0.0.0.0	
		back edit

Figure 61 – DHCP Settings Details

To edit the **DHCP** service configuration [DHCP server/DHCP relay], click the **edit** button in the **action** column:

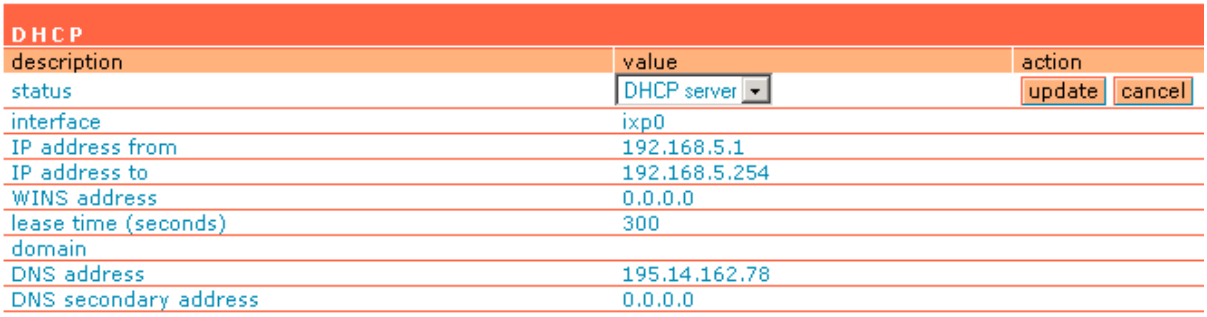


Figure 62 – Edit DHCP Configuration Settings

Status – select status from drop-down menu:

Disabled – disable the DHCP service on the selected interface
DHCP Server – enabled by default
DHCP Relay – to route DHCP through the external server, enable relay service

Case 1 Configure the DHCP server

Select the interface on which you want to configure the DHCP service [eth0/ixp0/vlan[n]]. Select the **DHCP server** and click the **update** button specify the DHCP server parameters:

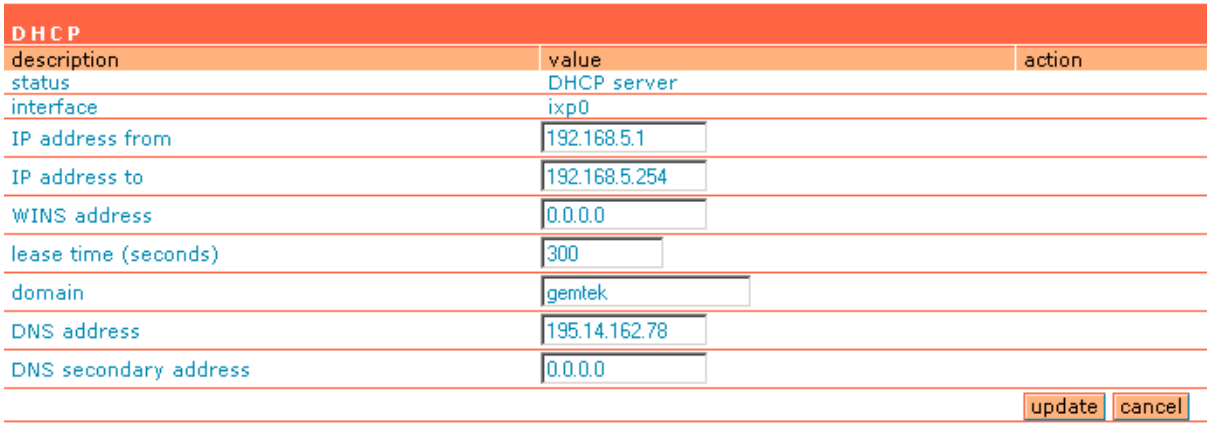


Figure 63 – Edit DHCP Server Settings

IP Address from/IP Address to – specify the IP address range supported for the **DHCP** service [mandatory fields].

WINS Address (Windows Internet Naming Service) – specify service IP address if it is available on the network [dots and digits].

Lease Time – specify the IP address renewal in seconds [1-1000000].

Domain – specify DHCP domain name [optional, 1-128 sting].

DNS address – specify the DNS server's IP address [in digits and dots notation].

DNS secondary address – specify the secondary DNS server's IP address [in digits and dots notation].

Case 2 Configure the DHCP relay

Select the interface on which you want to configure the DHCP service [eth0/ixp0/vlan[n]]. Select the **DHCP relay** and click the **update** button specify the DHCP relay parameters:

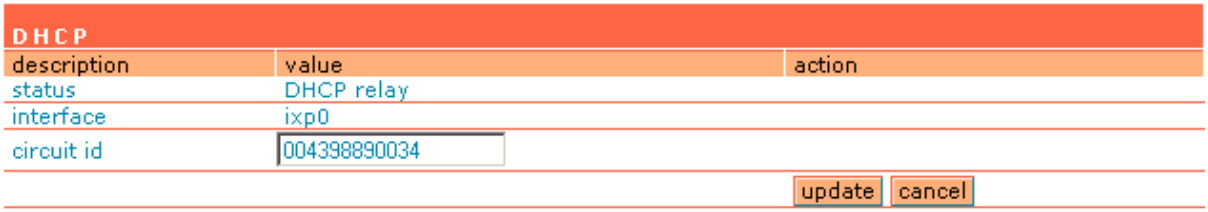


Figure 64 – Edit DHCP Relay Settings

Circuit ID – the unique DHCP relay parameter [optional, by default the MAC address of the device WAN interface is used].

If DHCP relay service is selected, the default WAN gateway is used automatically.

Update – to update entered values, the following screen appears:

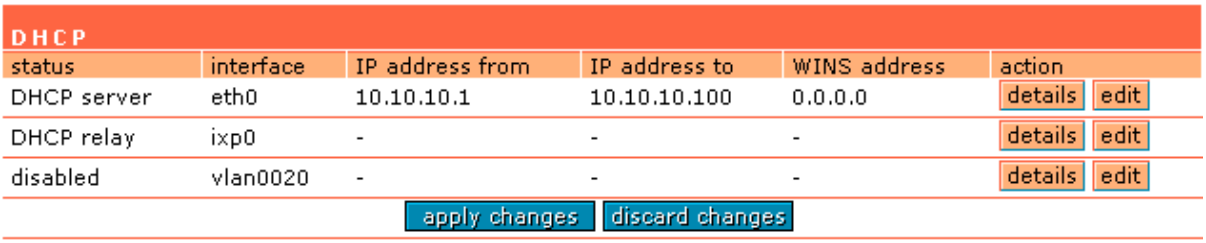


Figure 65 – Apply or Discard DHCP Server Settings

Apply Changes – to save entered new **DHCP** settings.

Discard Changes – to restore previous values.

Network Interface | RADIUS

RADIUS is an authentication and accounting system used by many Internet Service Providers (ISP). **RADIUS** enables ISPs to maintain a very large database of users. By using **RADIUS,** service providers can implement policy-based management of their subscribers' base. **RADIUS** also helps ISPs to collect statistical data about their subscribers (e.g. amount of time, amount of transferred bytes, and session time).

Use the **RADIUS** (Remote Authentication Dial In User Service) menu to set-up the following **RADIUS** settings:

- **RADIUS Settings** – general **RADIUS** settings configuration (e.g. NAS server ID, servers timeouts)
- **RADIUS Servers** – up to 32 different **RADIUS** servers' configuration (accounting and authentication servers)
- **WISP** (Wireless Internet Service Provider) **–** specify **WISP** domain for **RADIUS** server
- **Proxy –** configure the P560 to act as RADIUS proxy server.
- **Accounting Backup –** backup the **RADIUS** subscribers accounting information.

In the Appendix tables: **E) Standard RADIUS Attributes** and **Vendor Specific Attributes** Hotspot operators will find the required standard RADIUS attributes for setting up the RADIUS system.

Network Interface | RADIUS | RADIUS Settings

General **RADIUS** settings are configured using the **RADIUS settings** menu under the **network interface**:

RADIUS settings		
setting	value	action
RADIUS retries	5	edit
RADIUS timeout (seconds)	2	edit
NAS server id		edit
user session timeout (seconds)	18000	edit
user accounting update interval (seconds)	600	edit
user accounting update retry (seconds)	60	edit
user idle timeout (seconds)	900	edit
location ISO country code	us	edit
location E.164 country code	1	edit
location E.164 area code	408	edit
location network	GEMTEK_SYSTEMS	edit
hotspot operator name	GEMTEK_SYSTEMS	edit
location	Terminal_Worldwide	edit
bandwidth up	128.00 Kbps	edit
bandwidth down	128.00 Kbps	edit

Figure 66 – RADIUS Settings Configuration

RADIUS Retries – retry count of sending RADIUS packets before giving up.

RADIUS Timeout – maximum amount of time before retrying RADIUS packets [sec].

NAS Server ID – name of the RADIUS client.

User Session Timeout - amount of time from the user side (no network carrier) before closing the connection [sec].

User Accounting Update - period after which server should update accounting information [sec].

User Accounting Update Retry – retry time period in which server should try to update accounting information before giving up [sec].

User Idle Timeout - amount of user inactivity time, before automatically disconnecting user from the network [sec].

Location ISO Country code – location ID attribute, country code according ISO standards [string].

Location E.164 Country code – location ID attribute, country code according E.164 specification.

Location E.164 Area code – location ID attribute, area code according E.164 specification.

See the Location ID and ISO Country codes for your country in the Appendix: **F) Location ID and ISO Country Codes.**

Location Network – location ID attribute, network name [string].

Hotspot Operator Name – location name attribute, operator's name [string].

Location – location name attribute, textual description of the location [string].

Bandwidth Up – maximum bandwidth up at which corresponding user is allowed to transmit [bps].

Bandwidth Down – maximum bandwidth down at which corresponding user is allowed to receive [bps].

User can check its available bandwidth in the **logout** page statistics.

Each setting in this table can be edited. Select **RADIUS** setting you need to update, click the **edit** next to the selected setting and change the value:

RADIUS settings

setting	value	action
RADIUS retries	5	
RADIUS timeout (seconds)	1	update cancel
NAS server id		
user session timeout (seconds)	18000	
user accounting update interval (seconds)	600	
user accounting update retry (seconds)	60	
user idle timeout (seconds)	900	
location ISO country code	us	
location E.164 country code	1	
location E.164 area code	408	
location network	GEMTEK_SYSTEMS	
hotspot operator name	GEMTEK_SYSTEMS	
location	Terminal_Worldwide	
bandwidth up	128.00 Kbps	
bandwidth down	128.00 Kbps	

Figure 67 – Edit RADIUS Settings

Use the **update** button to update to an entered value. Now select another **RADIUS** setting to edit, or **apply changes** and restart the server if the server configuration is finished:

RADIUS settings

setting	value	action
RADIUS retries	5	edit
RADIUS timeout (seconds)	1	edit
NAS server id		edit
user session timeout (seconds)	18000	edit
user accounting update interval (seconds)	600	edit
user accounting update retry (seconds)	60	edit
user idle timeout (seconds)	900	edit
location ISO country code	us	edit
location E.164 country code	1	edit
location E.164 area code	408	edit
location network	GEMTEK_SYSTEMS	edit
hotspot operator name	GEMTEK_SYSTEMS	edit
location	Terminal_Worldwide	edit
bandwidth up	128.00 Kbps	edit
bandwidth down	128.00 Kbps	edit

apply changes discard changes

Figure 68 – Apply or Discard RADIUS Settings

Apply Changes – click if **RADIUS** settings configuration is finished.

Discard Changes – restore all previous values.

Network Interface | RADIUS | RADIUS Servers

Up to **32** different RADIUS servers can be configured under the **RADIUS servers** menu.

By default, one **RADIUS** server is specified for the system:

RADIUS servers

name	type	IP address	port	secret	action
DEFAULT (default)	authentication	0.0.0.0	1812	secret	details edit delete
	accounting	0.0.0.0	1813	secret	
					new

Figure 69 – RADIUS Servers Settings

New – add new RADIUS server.

Details – click on details to get more information about RADIUS server settings.

Edit – edit selected RADIUS server settings.

Delete – remove selected RADIUS server.

To view complete **RADIUS server** settings, click the **details** button in the action column:

RADIUS servers

description	value	action
name (default)	DEFAULT	
authentication ip	0.0.0.0	
authentication port	1812	
authentication secret	secret	
accounting ip	0.0.0.0	
accounting port	1813	
accounting secret	secret	
reverse accounting	disabled	
strip WISP	enabled	
UAM authentication method	pap	
		back edit

Figure 70 – RADIUS Server's Details

To edit **RADIUS server** click the **edit** button:

RADIUS servers

description	value	action
name	TEST	
default	☑	
authentication ip	192.168.2.88	
authentication port	1812	
authentication secret	pass	
accounting ip	192.168.2.88	
accounting port	1813	
accounting secret	pass	
backup on	☐	
backup ip	192.168.2.99	
backup port	1814	
backup secret	pass	
reverse accounting	enabled	
strip WISP	enabled	
UAM authentication method	pap	
		update cancel

Figure 71 – Add New RADIUS Server

Name – specify the new RADIUS server name.

Default – check the check box to make the selected RADIUS the default server.

Authentication IP – authentication RADIUS server IP address [dots and digits].

Authentication Port – specify the network port used to communicate with RADIUS [1-65535].

The port default value of 1812 is based on RFC 2138 "Remote Authentication Dial-in User Service (RADIUS)".

Authentication Secret – shared secret string that is used to encrypt data frames used for authentication server.

Accounting IP – accounting RADIUS server IP address [dots and digits].

Accounting Port – specify the network port used to communicate with RADIUS [1-65535].

Accounting Secret – shared secret string that is used to encrypt data frames used for accounting server.

Backup IP – backup RADIUS server IP address [dots and digits].

Backup Port – specify the network port used to communicate with RADIUS [1-65535].

Backup Secret – shared secret string that is used to encrypt data frames used for backup server.

Shared secret must be **the same** on **RADIUS server** and **RADIUS client**.

Reverse Accounting – [enabled/disabled]. The RADIUS accounting request contains **Acc-Input-Octets** and **Acc-Output-Octets** attributes. The interpretation of these attributes according the RFC2866 is relative to the point of view. If this point is at the AC - Acct-Input* attributes should contain the bytes/packets received at AC port from the client and Acct-Output* attributes should contain bytes/packets sent from AC port to the client. If we move this point to the client - we will get the reversing of Acct-Input* and Acct-Output* attributes values. The Acct-Input* then should contain bytes/packets received from AC, what is bytes/packets that AC sent to the user in AC point of view and what was Acct-Output*.

The AC implementation of RADIUS accounting request is at the client point of view (**reverse accounting** is disabled).

The value "**disabled**" means that Acct-Input* RADIUS attributes will contain bytes/packets **sent to the client** and Acct-Output* RADIUS attributes will contain bytes/packets **received from the client** during the curse of service being provided.

The value "**enabled**" means that info in the Acct-Input* and Acct-Output* RADIUS attributes will be swapped (reversed). That is the Acct-Input* will contain bytes/packets received from the client and the Acct-Output* will contain bytes/packets sent to the client.

Strip WISP – [enabled/disabled] select '**enabled**' if you want to strip WISP domain name before sending it to the RADIUS server. Stripping means removing everything before the "/" character including character itself for such user name login format like: "WISPdomain/username".

Select "**disabled**" if you need to send the user login name to RADIUS server unmodified. Some RADIUS servers can be configured in such way that requires full-unmodified user name to be sent.

UAM authentication method – select authentication method from drop-down menu:

PAP – Password Authentication Protocol
CHAP – Challenge Handshake Authentication Protocol
MSCHAP1 – Microsoft Challenge Handshake Authentication Protocol version 1
MSCHAP2 – Microsoft Challenge Handshake Authentication Protocol version 2

Update – add new specified RADIUS server.

Cancel – restore all previous values.

After adding a new RADIUS server or editing an existing one, the following controls appears:

Apply Changes – save changed configuration.

Discard Changes – discard all changes.

Restart – after **applying changes** to the system, you should restart the controller to make applied changes work.

Network Interface | RADIUS | WISP

Up to **32 WISP** entries can be defined using the **network interface | RADIUS | WISP menu.**

Different **WISPs** (Wireless Internet Service Providers) can be associated with appropriate RADIUS servers and device interfaces using the **network interface | RADIUS | WISP** menu:

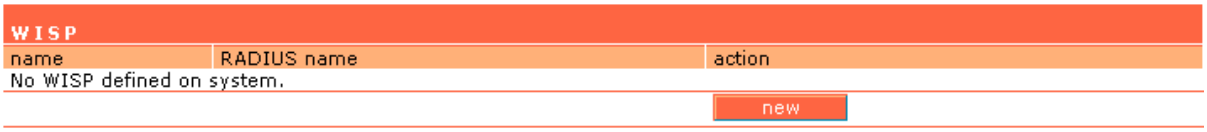


Figure 72 – WISP Menu

Hotspot subscribers user name format from WISP table is as follows:

- **username@WISPdomain**
- **WISPdomain/username**

New – click to define WISP for RADIUS server.

Figure 73 – Define New WISP

Name – new WISP domain name [string, up to 256 symbols, no space, dot or dash allowed].

RADIUS Name – select RADIUS for new WISP from list box [non editable].

Bound To – select the WISP binder interface [none/eixp0/ixp1/ixp2/vlan[n]]. The WISP can be associated with appropriate device interface.

Update – system with new WISP.

Cancel – restore all previous values.

Network Interface | RADIUS | Proxy

The P560 (AC) can forward the RADIUS authentication and accounting requests from Access Point (AP) to the real RADIUS server. To configure the RADIUS proxy, follow the steps:

Step 1 Connect the Access Point to any LAN port available on the Access Controller (P560). The AP should be in the bridge mode.

Step 2 Using the **network interface | RADIUS | proxy** menu configure the RADIUS proxy parameters: RADIUS authentication port (UDP), RADIUS accounting port (UDP) - different from authentication port and Accounting detection timeout:

RADIUS proxy		
description	value	action
RADIUS proxy status	enabled	edit
authentication port	1812	edit
accounting port	1813	edit
detection timeout	30	edit

Figure 74 – RADIUS Proxy Settings

RADIUS Proxy Status – select [enabled] to enable the RADIUS proxy feature [enabled/disabled].

Authentication Port – specify the port on AC for listening the RADIUS authentication packets. The AC RADIUS proxy authentication port will accept only RADIUS authentication packets [1-65535, default: 1812].

Accounting Port – specify the port on AC for listening the RADIUS accounting packets. The AC RADIUS proxy accounting port will accept only RADIUS accounting packets [1-65535, default: 1813].

Detection Timeout – specify the RADIUS proxy accounting detection timeout in seconds. The AC will wait the specified period for accounting packet after the authentication request was got [0-3600].

The authentication RADIUS proxy port should differ from the accounting port.

Step 3 Configure the AP to send the RADIUS authentication and accounting packets to the AC LAN IP address and UDP ports which are configured on AC RADIUS proxy configuration.

Step 4 The RADIUS secrets on AC should be set to value, which is good at the real RADIUS server for which the following packet will be forwarded.

Such preconfigured AC will act as RADIUS proxy and will forward the RADIUS authentication and accounting packets from AP according WISP and RADIUS server settings in the AC configuration without any modification.

Network Interface | RADIUS | Accounting Backup

The administrator can backup the hotspot subscribers' RADIUS accounting information in two ways:

- Via syslog protocol to the specified host
- Download to the selected location (e.g. on your PC)

Use the **network interface | RADIUS | accounting backup** menu:

accounting backup

description	status	host	action
backup via syslog	disabled	0.0.0.0	edit
backup to local file	enabled	-	edit

Figure 75 – Accounting Backup

Backup via syslog – enable this type to send the RADIUS accounting information via syslog protocol to the specified host [enable/disable] and note that the Host IP specification is obligatory.

Host – enter host IP address where to send accounting backup messages.

Backup to local file – enable this option, and the **download** button appears:

accounting backup

description	status	host	action
backup via syslog	disabled	0.0.0.0	edit
backup to local file	enabled	-	edit download

Download – click the button to download the accounting information file to your selected location.

Both types of accounting backup can be enabled.

Network Interface | Tunnels

This chapter describes the configuration of VPN tunnels. VPN tunnels can be used to secure management and AAA traffic between the hotspot network and the network operation center of the operator.

The Gemtek Systems Access Controllers support PPTP and GRE tunnels. Furthermore PPP (Point-to-Point Protocol) can be use to authenticate the AC to a authentication server and to assign IP settings to the WAN port of the AC.

Network Interface | Tunnels | PPPoE/PPTP/GRE

Use the **network interface | tunnels | PPPoE/PPTP/GRE** menu to connect to ISP via PPTP, PPPoE or GRE tunnel. All traffic will be sent via this tunnel.

Default gateway specified in **network interface | configuration** page will not be used, because all Internet traffic will be sent/received via the specified PPTP, PPPoE or GRE server (tunnel).

By default no services are available on the controller:

Figure 76 – PPPoE/PPTP/GRE for DSL

To specify **PPTP** tunnel for your controller click the **edit** button and enter the following:

Figure 77 – Specify PPTP Tunnel

Service – select service PPTP.

Username – enter username to connect to the server [text string, can not be empty].

The same username should be configured on the PPTP server.

Password – enter password by which user should be authenticated [text string, can not be empty].

Encryption – enables use of MPPE encryption.

Server IP – PPTP server IP address.

To specify **PPPoE** tunnel for your controller click the **edit** button and enter the following:

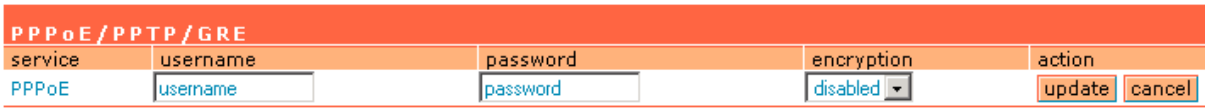


Figure 78 – Specify PPPoE Tunnel

Service – select service PPPoE.

Username – enter username to connect to the server [text string, can not be empty].

The same username should be configured on the PPPoE server.

Password – enter password by which user should be authenticated [text string, can not be empty].

Encryption – enables use of MPPE encryption.

When PPPoE tunnel is used, then no server IP is required - broadcast address will be used.

To specify **GRE** tunnel for your controller click the **edit** button and enter the following:

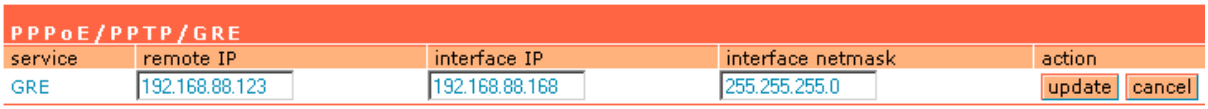


Figure 79 – Specify GRE Tunnel

Service – select service GRE.

Remote IP – IP address of GRE tunnel endpoint [IP address].

Interface IP – enter the IP address of GRE interface [IP address].

Interface Netmask – enter the netmask of GRE interface [netmask].

Network Interface | Tunnels | PPTP Client for VPN

PPTP Client for Virtual Private Network (VPN) is designed to secure the management and AAA traffic as well as to establish a VPN tunnel connection to the network operation center, for example when the administrator needs to reach access points behind the P560 from his workstation.

Should be used with **Management Subnet** feature, otherwise the firewall will not be enabled to reach anything behind the P560.

Only specific traffic will be sent to the tunnel with everything else sent using the default gateway specified on **network interface | configuration** page.

By default no PPTP clients are defined for the controller:

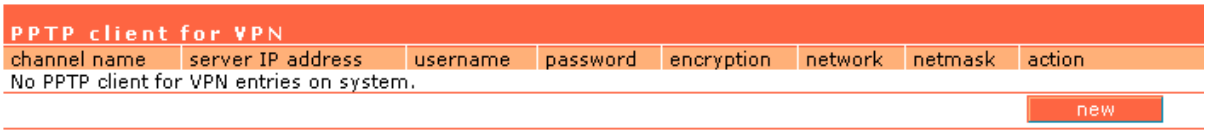


Figure 80 – PPTP Client for VPN

To specify new tunnel for your AC, click the **new** button:

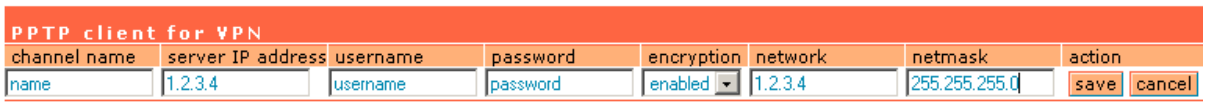


Figure 81 – Add PPTP Client

Channel Name – enter free form string for tunnel identification (for user only).

Server IP Address - IP address [can not be empty].

Username – enter username to connect to the PPTP server [text string, can not be empty].

Password – enter password by which user should be authenticated [text string, can not be empty].

Encryption – enables use of MPPE encryption.

Network/Netmask – enter remote network settings [format: dots and digits].

Up to **16** VPN entries can be set.

Network Interface | Tunnels | GRE Client for VPN

GRE (Generic Routing Encapsulation) tunnel is one of the solutions for tunneling private network over the TCP/IP connection (e.g. PPTP, L2TP, PPPoE). **GRE** tunnel does not use encryption. It only encapsulates data and sends it over the Internet. So the administrator should take care that no unencrypted private information is going through the GRE tunnel. By default the GRE tunnel is disabled on the AC:

GRE client for VPN		
setting	value	action
GRE status	disabled	edit
GRE remote host	0.0.0.0	edit
GRE interface IP	0.0.0.0	edit
GRE interface netmask	0.0.0.0	edit
GRE route	0.0.0.0/0	edit

Figure 82 – GRE Tunnel

See the following example to understand **GRE settings**.

Example:

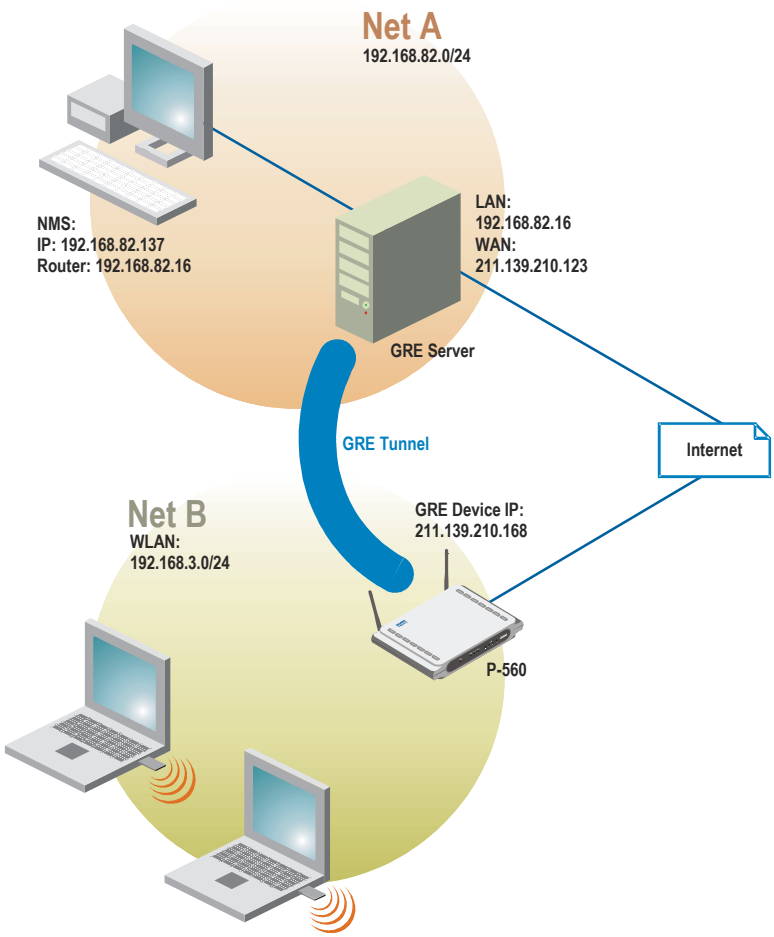


Figure 83 – GRE Tunnel

For example, there are 2 internal networks: network A and B, and intermediate network - Internet.

Network A (administrator's computer with Network Management System); we shall call this network (192.168.82.0/24) "**Net A**".

Network:	192.168.82.0
Netmask:	255.255.255.0
Router:	192.168.82.16

GRE server has two interfaces, LAN and WAN:

LAN IP:	192.168.82.16
WAN IP:	211.139.210.123

Settings in GRE tunnel page:

GRE Remote Host:	211.139.210.123
GRE Route:	192.168.82.0/24

Network B has subscribers on wireless P-560 interface (eth0) we shall call this network (192.168.3.0/24) "**Net B**":

Network:	192.168.3.0
Netmask:	255.255.255.0
Router:	192.168.3.1

Where GRE interface (WAN IP of AC) is 211.139.210.168.

Settings in **GRE** tunnel page:

GRE Device IP:	211.139.210.168
GRE Device Netmask:	255.255.255.0

Settings in **Management Subnet** page on eth0 interface (**network interface | configuration | management subnet** menu) of AC:

IP Address:	192.168.3.1
Netmask:	255.255.255.0
Remote Network:	192.168.82.1
Remote Netmask:	255.255.255.0

management subnet

interface	status	IP address	netmask	remote network	remote netmask	action
eth0	enabled	192.168.3.1	255.255.255.0	192.168.82.1	255.255.255.0	edit
ixp0	disabled	0.0.0.0	0.0.0.0	0.0.0.0	0.0.0.0	edit

Figure 84 – Management Subnet Settings

As far as the Internet is concerned, we assume that it will pass any packet sent from A to B and vice versa.

With settings from above, the administrator from **Net A** will be able to access clients on **Net B** through the GRE tunnel between the GRE server and the GRE interface of AC.

Use the **edit** button next to a setting to change its value:

GRE client for VPN

setting	value	action
GRE status	enabled	edit
GRE remote host	211.139.210.123	edit
GRE interface IP	211.139.210.168	edit
GRE interface netmask	255.255.255.0	edit
GRE route	192.168.82.0/24	edit

Figure 85 – GRE Settings

GRE Status – select one: [enabled or disabled].

Remote Host – IP address of GRE tunnel endpoint [IP address].

GRE Interface IP – enter the IP address of GRE interface [IP address].

GRE Interface Netmask – enter the netmask of GRE interface [dots and digits].

GRE interface IP/Netmask settings is important when configuring the GRE server.

GRE Route – this is the destination network for the GRE tunnel in the combined node/subnet format [IP address/N].

The /N stands for the number of bits that are in the network address. There are 32 bits, so we have 32-N bits left that are part of our network. The first N bits of x.x.x.x correspond to x.0.0.0 when N=8, our network address, and the netmask is 255.0.0.0 (when N=8).

bits	netmask
/32	255.255.255.255
/31	255.255.255.252
/30	255.255.255.248
…	…
/26	255.255.255.192
/25	255.255.255.128
/24	255.255.255.0
…	…
/16	255.255.0.0
…	…
/8	255.0.0.0
…	…
/0	0.0.0.0

Network Interface | Wireless

The Hotspot-in-a-Box has the wireless interface (eth0) and can act as the Access Point. Using the **network interface | wireless** menu, the system administrator can create a wireless network infrastructure (WDS), set the wireless basic settings (SSID, network mode: 802.11b/802.11g, regulatory domain/channel), set the advanced settings (layer 2 isolation, SSID broadcasting), select the security methods (WEP/WPA) or create the access control list (ACL).

Network Interface | Wireless | Basic

Use the **network interface | wireless | basic** menu to configure such wireless settings as SSID, network mode or regulatory domain/channel. Click the edit button on the setting you need to change:

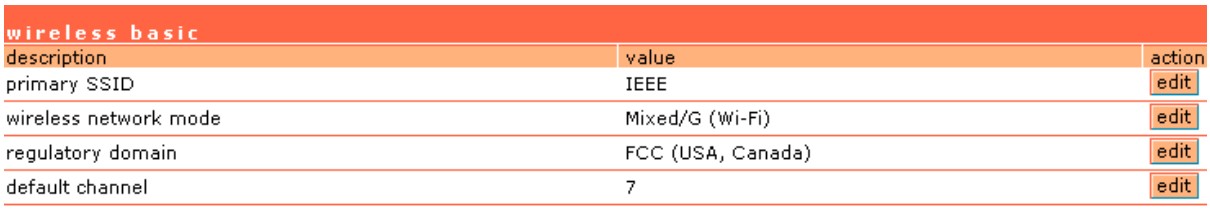


Figure 86 – Basic Wireless Settings

Primary SSID – is a unique name for your wireless network. It is case sensitive and must not exceed 126 characters. The default SSID is "P560" but you should change this to a personal wireless network name. The SSID is important for clients when connecting to the access point. All client stations must have their client SSID settings configured and must use the same SSID.

Wireless Network Mode – select wireless network mode for optimal performance, from the drop down list. Each wireless network mode includes basic and supported rates.

Wireless Network Mode	Basic Rates (Mbps)	Supported Rates (Mbps)	Preamble Settings	Non ERP Protection	Slot Settings	CWmin
B only	1, 2, 5.5, 11	-	Dynamic	Dynamic	Long	31
G (Wi-Fi)*	1, 2, 5.5 6, 11, 12, 24	9, 18, 36, 48, 54	Dynamic	Dynamic	Dynamic	15
B (Wi-Fi)	1, 2	5.5, 11	Dynamic	Dynamic	Long	31
Mixed/G (Wi-Fi)	1, 2, 5.5, 11	6, 9, 12, 18, 24, 36, 48, 54	Dynamic	Dynamic	Dynamic	15
Mixed	1, 2, 6, 12, 24	5.5, 9, 11 18, 36, 48, 54	Dynamic	Dynamic	Dynamic	15
Mixed (Wi-Fi)	1, 2, 5.5, 6, 11, 12, 24	9, 18, 36, 48, 54	Dynamic	Dynamic	Dynamic	15

* This mode enforces rejection of non-ERP capable clients.

Data Rates – the range of data transmission rates supported by a device and they are measured in megabits per second (Mbps).

Basic Rates – are the list of rates that are mandatory for another radio to communicate with. These rates are used for packets such as, control packets and broadcast packets.

Supported Rates – are the list of rates that the radio is capable of running.

Preamble Settings – indicates **Dynamic** mode that allows mixing Long Preamble only clients with Short Preamble capable clients. If both 802.11g clients and Long Preamble only clients are

associated, the Access Point sets the Short Preamble capability bit to 0 and Long Preamble is used. In all other cases, the Short Preamble capability bit is set to 1 and Short Preamble is used.

CWmin – indicates contention window size minimum.

NonERP Protection – indicates **Dynamic** mode what means that NonERP protection bit is set to 0 or 1 whether NonERP BSSs or stations are associated to AP or not.

Slot Settings – indicates **Dynamic** or **Long** mode:

- **Dynamic** mode allows mixing 802.11b only clients with Short Slot capable clients. If only 802.11g Short Slot capable clients are associated, 802.11a slot timing is used and the Short Slot capability bit is set. If any non-802.11g/Short Slot capable clients are associated, the access point switches back to 802.11b slot timing and clears the Short Slot capability bit.
- **Long** mode indicates that the access point never sets the Short Slot capability bit in the Beacons, Probes and Association Responses. Clients should therefore not use it.

Regulatory Domain – select the domain according to your country.

The full frequency range of the 2.4 GHz ISM band is not permitted for use in all countries. Depending on your selection of regulatory domains, the available frequency channels will vary.

Before changing radio settings manually verify that your settings comply with government regulations. At all times, it will be the responsibility of the end-user to ensure that the installation complies with local radio regulations. Refer to the Appendix: **C) Regulatory Domain/Channels.**

Default Channel – select the default channel. Channels list will vary depending on selected regulatory domain.

Multiple frequency channels are used to avoid interference between nearby access points. If you wish to operate more than one access point in overlapping coverage areas, we recommend a distance of at least four channels between the chosen channels. For example, for three Access Points in close proximity choose channels 1, 6 and 11.

Network Interface | Wireless | Advanced

Use the **network interface | wireless | advanced** menu to configure the layer 2 client isolation, SSID broadcasting or threshold values or wireless card output power:

wireless advanced		
description	value	action
layer 2 isolation	enabled	edit
SSID broadcasting	enabled	edit
fragmentation threshold (bytes)	2346	edit
RTS threshold (bytes)	2347	edit
output power (dBm)	10	edit
antenna gain (dBi)	2	edit

Figure 87 – Advanced Wireless Setting

Layer 2 Isolation – Layer 2 wireless client separation. Connected clients with user isolation function enabled cannot access each other directly. The clients are isolated from each other using their MAC addresses [enabled/disabled].

SSID Broadcasting – when enabled, your AP's SSID is visible in the networks list while scanning the available networks for wireless client. When disabled, the AP's SSID is not visible in the available network list (SSID is not broadcasted with its Beacons) [enabled/disabled]. By default the SSID broadcasting is enabled.

Fragmentation Threshold –the fragmentation threshold, specified in bytes, determines whether packets will be fragmented and at what size. On an 802.11 wireless LAN, packets exceeding the fragmentation threshold are fragmented, i.e., split into, smaller units suitable for the circuit size. Packets smaller than the specified fragmentation threshold value are not fragmented [[256-2346] default: 2346 (2346 means that fragmentation is disabled)].

RTS Threshold – when set, this setting specifies the maximum packet size beyond which the Wireless LAN Card invokes its RTS/CTS mechanism. Packets that exceed the specified RTS threshold trigger the RTS/CTS mechanism. The NIC transmits packets smaller than this threshold without using RTS/CTS [[0-2347] default: 2347 (2347 means that RTS is disabled)].

Output Power – the wireless card transmission output power in dBm [0-31].

Antenna Gain (dBi)– is the gain of the connected antenna in relation to an isotropic radiated power.

Total output power (wireless **output power** plus **antenna gain**) should comply with local radio regulations. Refer to the Appendix: **C) Regulatory Domain/Channels.**

Network Interface | Wireless | Security

Secure your wireless network use one of the available encryption methods:

- **WEP** (Wired Equivalent Privacy) with 64-bit/128-bit encryption
- **WPA** (Wi-Fi Protected Access) with pre shared key or with RADIUS server

The WPA is a far stronger protocol and fixes the weaknesses in WEP. To enable the WPA security for your WLAN you will need:

- An access point that has WPA support (e.g. Gemtek Systems P-560)
- A wireless network card that has WPA drivers available
- A mobile client that supports WPA and your operating system

To configure the WPA with pre-shared key security on the P-560 use the **network interface | wireless | security** menu, select the WPA with pre-shared key security method and enter the pre-shared key:

Figure 88 – WPA with Pre-shared Key Security Settings

Pre-shared Key – specify the pre-shared key for WPA security [8-64 characters].

The encryption pre-shared key must also be entered into the WLAN card configuration of the mobile clients.

Update – click the button to apply security setting to your wireless network.

WPA with RADIUS server makes use of external AAA (RADIUS) server to generate and exchange dynamic WPA keys between P-560 and user station. To configure the WPA with RADIUS server security on the P-560 use the **network interface | wireless | security** menu and select the WPA with RADIUS server security method:

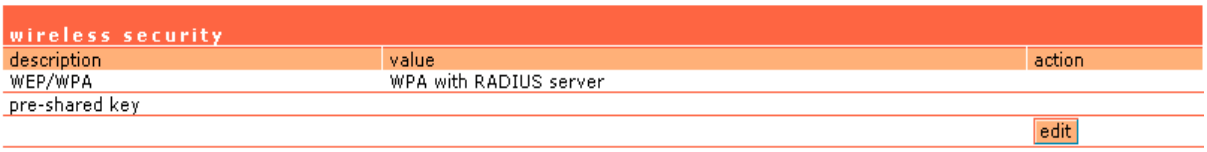


Figure 89 – WPA with RADIUS Server Security Settings

To configure the WEP encryption, select the WEP key algorithm and enter the pre-shared key:

Figure 90 – WEP Security Settings

WEP keys are entered as a series of colon-separated HEX (0-9, A-F, and a-f) pairs:

5 pairs for 64-bit (e.g. 00:AC:01:35:FF)
13 pairs for 128-bit (e.g. 00:11:22:33:44:55:66:77:88:99:AA:BB:CC)

The encryption pre-shared key must also be entered into the WLAN card configuration of the mobile clients.

Network Interface | Wireless | ACL

Use the **ACL** service to control the default access to the wireless interface (eth0) of the AC or define special access rules for mobile clients. Configure the ACL using the network interface | wireless | ACL menu:

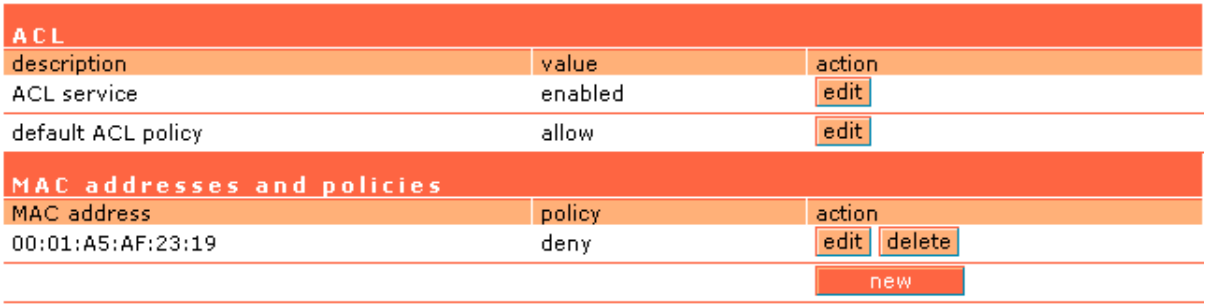


Figure 91 – ACL Service

ACL service – click the **edit** button to enable or disable the access control service on device. By default the ACL service is disabled and all mobile clients connections to the AC are allowed (no ACL rules are applied to the mobile clients).

Default ACL policy – click the edit button to change the default ACL policy [allow/deny]. Select **allow** to allow all mobile clients to access this access point or **deny** to prevent all mobile clients from accessing your access point. Clients may also be subject to rules in the **MAC addresses and policies** table.

You can create your own access list if you need to define special access rules for specific network devices. The access control list is based on the network device's MAC address. In the **MAC addresses and policies** table, you need only specify the network device MAC address and its access policy (accept/deny) with the new rule. Click the **new** button to define the ACL rule:

Figure 92 – Add ACL Rule

MAC Address – enter the physical address of the network device you need to (MAC address) The format is a list of colon separated hexadecimal numbers (for example: 00:AA:A2:5C:89:56).

Policy – select the permission of the rule to determine whether the specified network device should be allowed or denied as an access point client [allow/deny].

The special ACL rule policy should differ from the default ACL policy otherwise the ACL rule does not work.

Update – click the button to add new ACL rule.

Network Interface | Wireless | WDS

A **WDS (Wireless Distribution System)** allows you to create a wireless network infrastructure. Normally, the access points must be connected with a wire (LAN), which is generally an Ethernet connection in business applications. Once connected, these access points create wireless cells allowing a wireless connection. The WDS feature allows the access points to be wirelessly connected to another access point, eliminating the need to the wired connection between them:

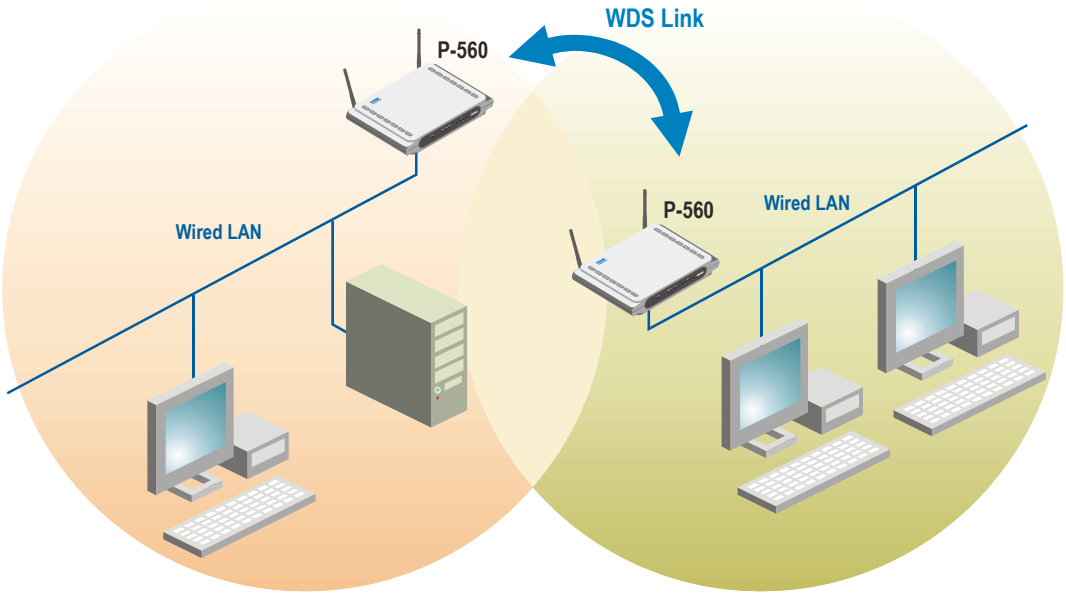


Figure 93 – WDS Link

The WDS mode is configured by entering the WDS link peer access points (AP e.g. P-560) MAC address in each other's AP configuration e.g. Web interface. As a result APs that relay data received from a wireless station to another access points (and vice versa) have to receive and send each packet over the same channel. Hence the overall throughput will be reduced for each relay link.

The **radio channel** in all WDS link peer APs **must be the same.**

To configure the WDS links use the **network interface | wireless | WDS** menu, click the edit button and enter the peer access point MAC addresses:

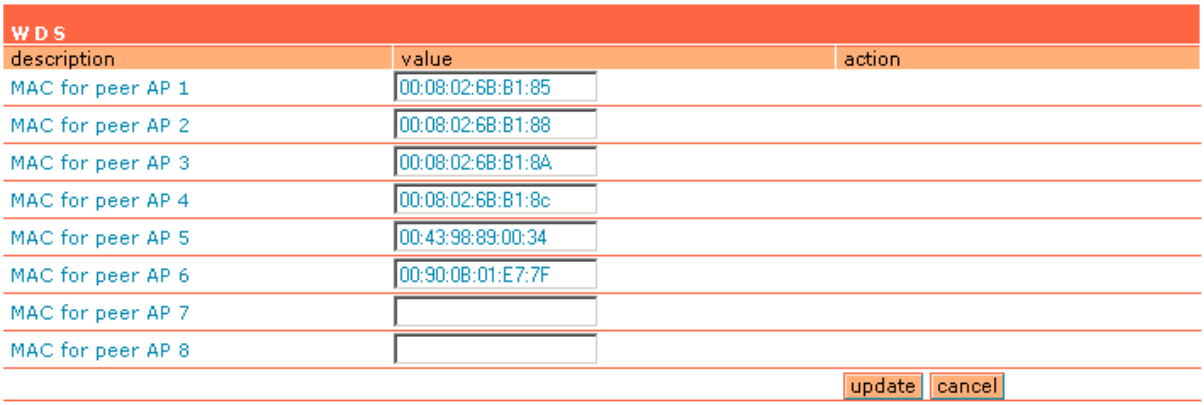


Figure 94 – Add WDS Link

MAC for Per AP [1-8] – enter **wireless interface** (eth0) **MAC** address of the peer AP for the WDS link [6-HEX pairs separated by colon [1-9] [A-F] [a-f]].

You can discover the wireless interface (eth0) MAC address of your P-560 in the **system | status** page.

Update – click the button to update you system with WDS links.

User Interface

Use the **user interface** menu to configure device settings affecting the user interface. If you need to configure the: welcome/login/logout/help/unauthorized pages, administrator settings, start page or free sites, use the **user interface** menu.

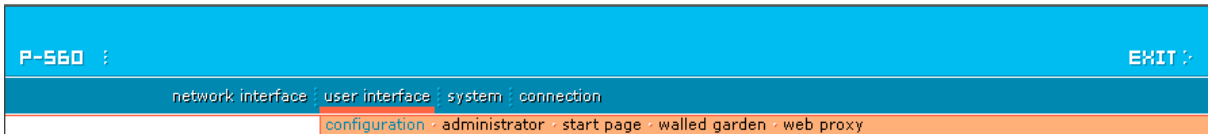


Figure 95 – User Interface Menu

User Interface | Configuration | Pages

Detailed description about user page customization is given in the **Chapter 4 – User Pages**.

The **welcome/login/logout/help** pages can be easily changed to user defined pages by choosing the **configuration** menu. The **pages** configuration menu is displayed by default:

pages

page	use	status	location	action
welcome	internal	enabled	welcome.xsl	change
login	internal	-	login.xsl	change
logout	internal	-	logout.xsl	change
help	internal	-	images/help.html	change
unauthorized	internal	-	images/unauthorized.html	change
one click	internal	-	oneclickuser.xsl	change

caching

status	action
disabled	change
clear cached templates	clear

Figure 96 – Available User Pages for Configuration

Login/Logout/Help/Unauthorized pages settings detailed description is given in the Chapter 4. Only **Welcome** page settings reference is provided here.

Welcome – first page the user gets when he/she opens its browser and enters the URL.

Internal – choose this option when using the internal user pages templates.
External – choose this option when uploading your own user pages templates.
Redirect – choose this option when using the **Extended UAM** function (see Chapter 4, section: **Extended UAM**).

Status – choose enable/disable welcome page status. Note that redirect option with status 'disabled' would work.

Location – enter location for external templates or redirect (e.g. WAS IP address).

pages

page	use	status	location	action
welcome	redirect	enabled	http://192.168.2.11/portal/	change
login	internal	-	login.xsl	change
logout	internal	-	logout.xsl	change
help	internal	-	images/help.html	change
unauthorized	internal	-	images/unauthorized.html	change
one click	internal	-	oneclickuser.xsl	change

Figure 97 – Redirect User Pages

Welcome page with **redirect** option selected redirects the user authentication process to the specified location. The user welcome/login/logout page can be implemented as simple HTML (not required to use the .XSL or default user pages templates) in such case.

The redirect location URL should be specified as Walled Garden URL, otherwise the redirect would NOT WORK.

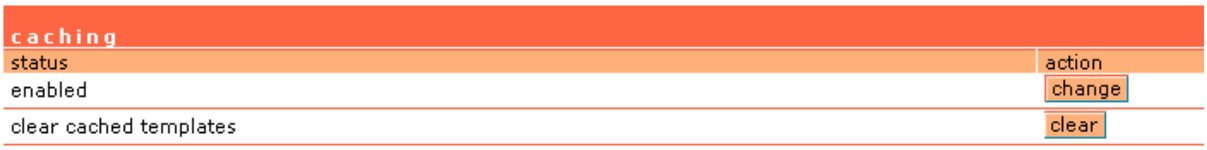


Figure 98 – Caching Option

Caching option can be used for caching the external uploaded user pages (available choice: enabled/disabled)

Clear – click the button to clear cached user pages.

Controller cache is also cleared after device reboot/reset.

User Interface | Configuration | Upload

Look for the **user pages template samples** in the **Installation CD** delivered to you with the product.

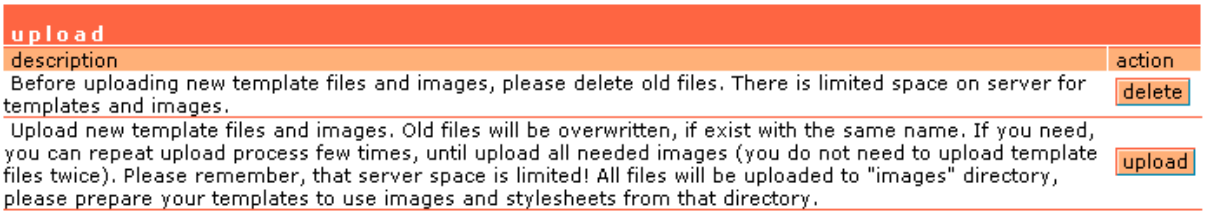


Figure 99 – Upload Page

Delete – click the button to delete earlier uploaded files from Hotspot-in-a-Box memory.

Upload – click the button to select and upload new user pages.

How to upload user pages see in the **Chapter 4 – User Pages**.

User Interface | Configuration | Headers

System administrator can set **HTML headers encoding** and **language** settings for AC web management interface and new uploaded user pages. Select **user interface | configuration | headers** menu:

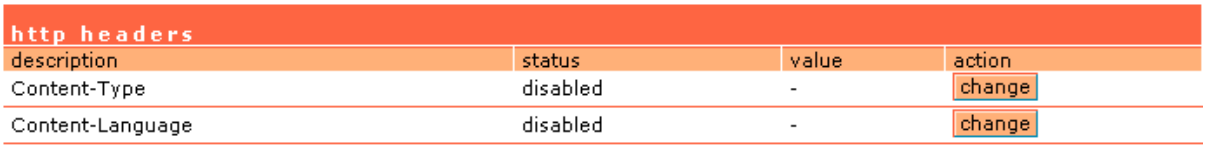


Figure 100 – HTTP Headers Settings

P560 device supports some http META tags. Syntax of such META tags:

```
<META HTTP-EQUIV="name" CONTENT="content">
```

Currently P560 supports **Content-Type** and **Content-Language** tags:

- **Content-Type** is used to define document char set (used, when text has non-Latin letters, like language letters).
- **Content-Language** may be used to declare the natural language of the document.

P560 automatically adds defined content-type and content-language to generated XML. Then user pages (.XSL) templates will use these parameters to generate the output HTML.

Click the change button to define new headers of the web management interface on user pages templates. The default HTML encoding is **ISO-8859-1**, language = **English**. Enable the HTTP header status and default values appear:

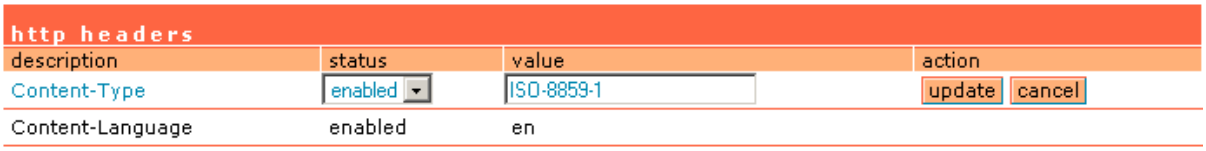


Figure 101 – Set HTTP Headers

The system administrator can set his own header encoding and language settings.

Use the HTML 4.01 specification to define the header encoding and language.

User Interface | Configuration | Remote Authentication

Read more about extensions feature in **Chapter 4**, section: **Extended UAM.**

The **Remote Authentication** feature under the **user interface | configuration** menu allows an external Web Application Server (WAS) to intercept/take part in the user authentication process, externally log on and log off the user as necessary. It provides means to query user session information as well. By default such remote authentication is disabled:

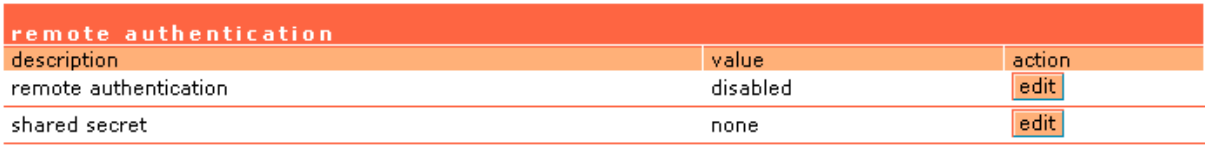


Figure 102 – Remote Authentication

Click the **edit** button next to appropriate settings to specify **remote authentication** parameters:

Figure 103 – Enable Remote Authentication

Remote Authentication – select status: [enabled/disabled].

Shared Secret – enter password for WAS to communicate with AC [sting (4-32), no spaces allowed].

User Interface | Configuration | One-Click Roaming

One-Click roaming is the ability of T-mobile customers to use the T-mobile Hotspot service in Third Part Hotspots, while the authentication and billing is entirely realized through T-mobile. The Third Part Hotspot only provides the access to the T-mobile WLAN platform. Use the **network interface | configuration | one click** menu to configure this feature. By default One-Click roaming is disabled. Click the **edit** button to change roaming status.

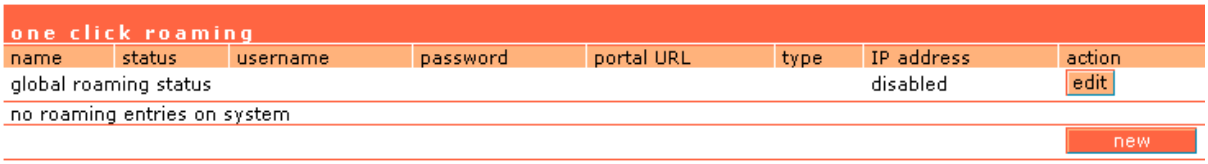


Figure 104 – One-click Roaming Settings

To add a new One-Click partner, click the **new** button:

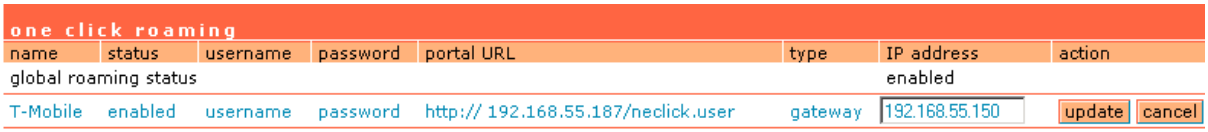


Figure 105 – Add new One-Click partner

Name – enter One-Click roaming partner's name.

Status – select status: [enabled/disabled].

Username – enter username that is valid user name on RADIUS server [text string, can not be empty].

Password – enter password by which user should be authenticated [text string, can not be empty].

Portal URL – enter T-mobile portal URL to redirect user when One-Click roaming is enabled (optional parameter).

Type – choose source routing policy: clients' traffic can be either routed directly via secondary router or via PPTP tunnel. Choose **gateway** to route clients' traffic via specified router's **IP address**. Or choose **PPTP- [name]** tunnel that was created for t-mobile users' traffic to route through.

IP address – enter One-Click roaming gateway IP address that is reachable via WAN interface [can not be empty if gateway type is selected].

Update – click to update One-Click roaming settings.

Welcome Pages are stored on Portal. Every user, even T-mobile and Netcheckin will see Welcome pages loaded from Portal server. The Welcome page with portal URL should be entered on **network interface | configuration | page**.

See the following diagram to understand **One-Click roaming**:

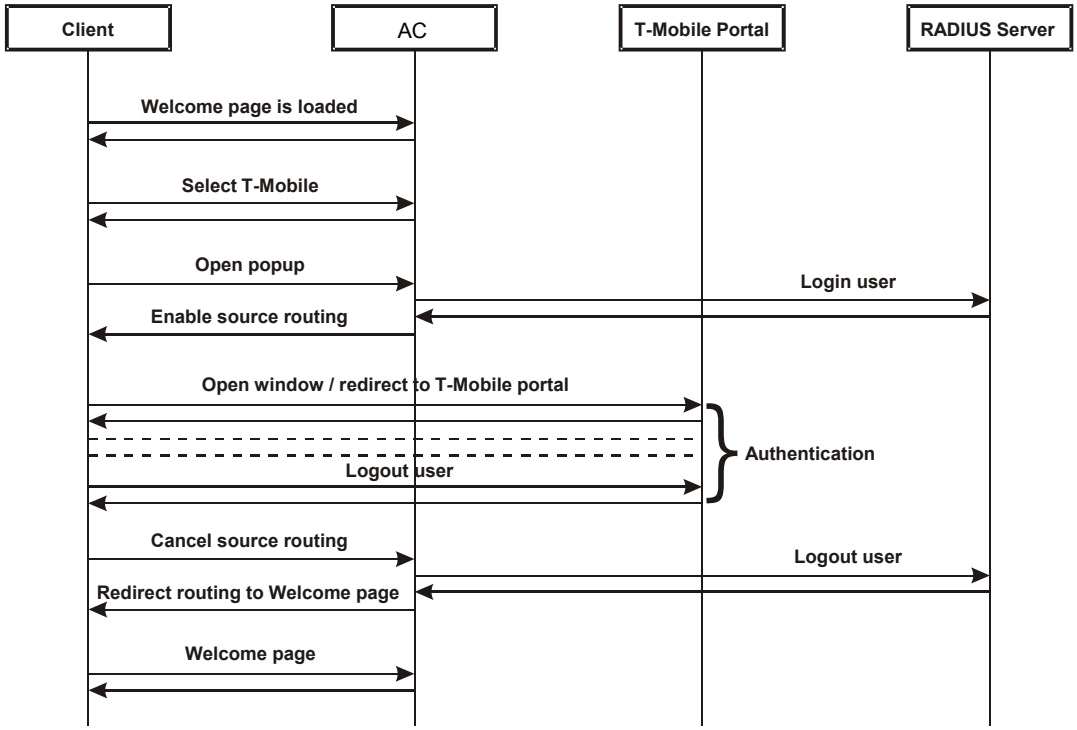


Figure 106 – One-Click Roaming diagram

When T-mobile user attempt connect to internet it is redirected to 'Welcome Page' on access controller. Then client selects T-mobile, AC internally authenticates client with a provided username and password. AC opens a new browser window and which in turns open popup window. Latter popup window will allow canceling source routing policy at any time and returning to a welcome page.

User Interface | Administrator

The system administrator also can be the RADIUS user with corresponding attributes.

The **administrator** menu is for changing the administrator's settings: user name and password:

administrator		
username	idle timeout	action
admin	default	edit

Figure 107 – Administrators Settings

Default administrator logon settings are:

User Name: **admin**

Password: **admin01**

To edit or change the administrator settings simply click the **edit** button:

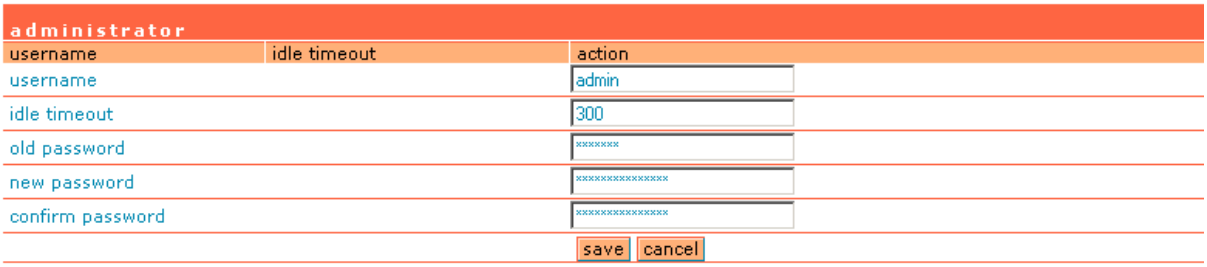


Figure 108 – Change Administrator Settings

Username – administrator username for access to Access Controller (e.g. web interface, CLI mode) [1-32 symbols, spaces not allowed].

Idle Timeout – amount of administrator inactivity time, before automatically disconnecting administrator from the web interface [300-3600 seconds]. The default idle time: 10minutes (600 seconds).

Old Password – old password value.

New Password –new password value used for user authentication in the system [4-32 symbols, spaces not allowed].

Confirm Password – re-enter the new password to verify its accuracy.

Save – click to save new administrator settings.

User Interface | Start Page

The **start page** is the default web page where users will be redirected after log-on. This value will be overwritten by the WISP RADIUS attribute no.4 "Redirection-URL" if provided in the authentication response message. Use the **user interface | start page** menu to view or change the start page URL:

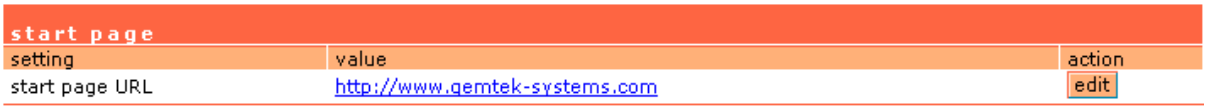


Figure 109 – Start Page

The administrator can change the **start page** by clicking the **edit** button. The value entry field will change into an editable field:

Figure 110 – Edit Start Page

Value – enter new redirection URL of start page in valid format [http://www.startpageurl.com].

Save – to save new settings.

Cancel – restores all previous values.

User Interface | Walled Garden

The **walled garden** is an environment that controls the user's access to Web content and services. This feature gives the ability to define a free, restricted service set for a user not yet logged into the system. Use the **user interface | walled garden** menu to view or change the free URLs or hosts:

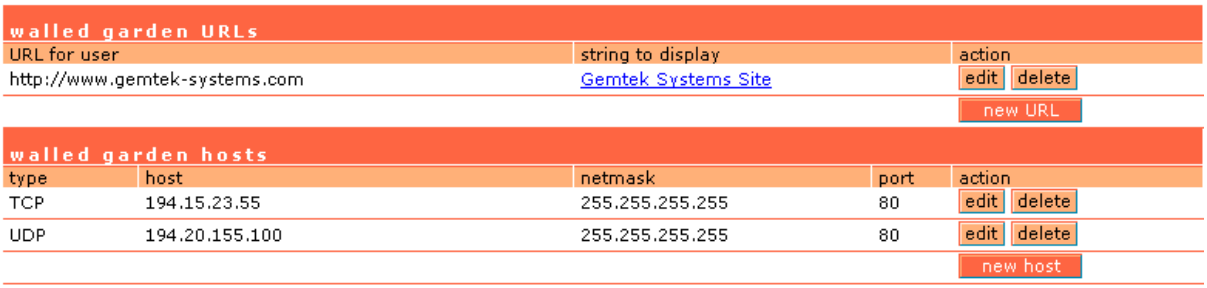


Figure 111 – Walled Garden

Edit – edit the selected URL or host. All settings become available for editing.

Delete – delete the selected URL or host.

New URL – click the **new URL** button and enter the new URL and its description. Save entered information by clicking the **update** button:

Figure 112 – Add New URL part 1

URL for User – define full URL address [www.gemtek-systems.com].

String to Display – site description visible to user as link on the **welcome** and **login** page:

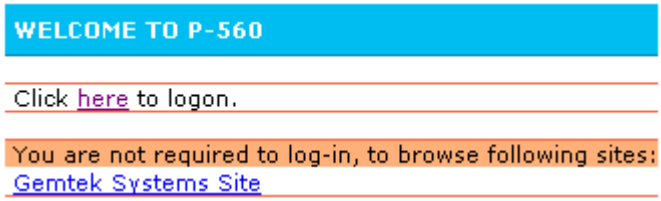


Figure 113 – Walled Garden link in the Welcome Page

New Host – If you need to define hosts (web servers) for walled garden, specify hosts by clicking the **new host** button and click the **update** button:

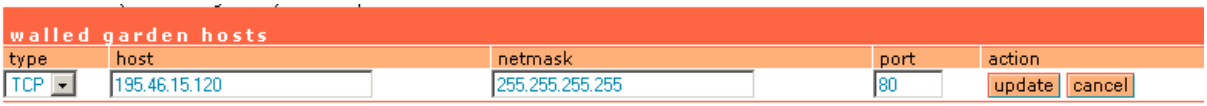


Figure 114 – Walled Garden Host

Type –select the data traffic protocol for host server [TCP/UDP].

Host – Web server address [IP address or host name].

Netmask – enter the network mask to specify the host servers network.

Port – network port, which is used to reach the host [1-65535]. For standard protocols use the default ports:

Protocol	
HTTP	80
HTTPS	443
FTP	21

User Interface | Web Proxy

The enabled **web proxy** allows any clients' connections with configured proxy settings on their browsers. The AC accepts any client proxy configurations and grants the access to the Internet. The system administrator should list only ports the AC is listening on for proxy requests.

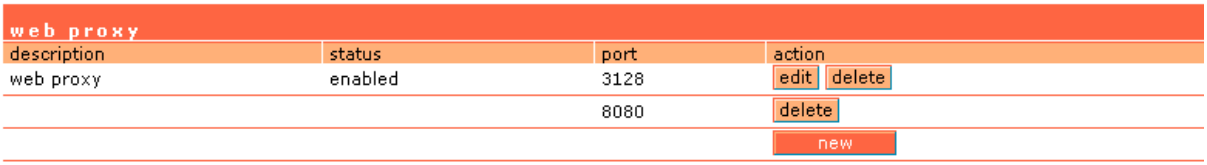


Figure 115 – Web Proxy

Web proxy is enabled by default and the port numbers are: 3128 and 8080.

To add more port number for web proxy, click the **new** button:

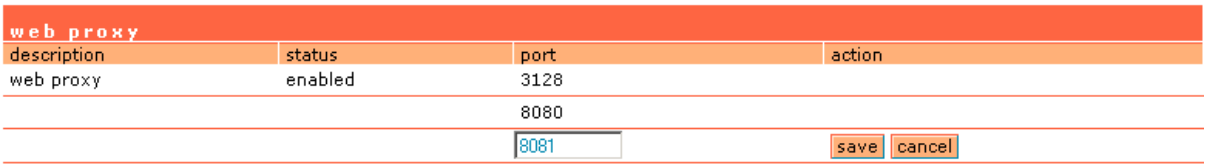


Figure 116 – Add Web Proxy Port

Port – add port number for web proxy to listen to [1-65535].

Save – click the button to save new proxy port number.

System

Use the **system** menu to **configure** such system utilities:

- **Syslog** – for sending system and debug messages via the syslog protocol.
- **Trace system** – trace such controller services as PPTP and PPPoE.
- **Clock** – manual setting of internal device clock.
- **NTP** – set the Network Time Protocol service on the AC.
- **Certificates** – upload your own SSL certificate and private key files for server.
- **Save and Restore** – save current AC configuration and restore.

Use the **system** menu to define default access/visitor access to the device via or using:

- **Telnet** – enable telnet connections to AC.
- **AAA** – enable different AAA methods.
- **UAT** – enable the service.
- **SNMP** – enable/configure SNMP management.

Use the **system** menu to check the system status, reset the device, or update with new firmware.

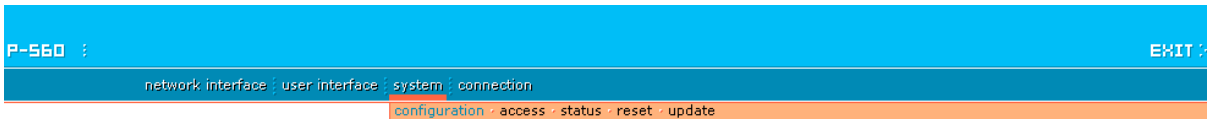


Figure 117 – System Menu

System | Configuration | Syslog

You can trace your AC system processes and get the system log messages remotely using the **system | configuration | syslog** menu (by default the **syslog** utility is disabled):

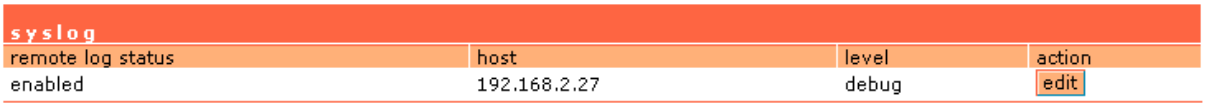


Figure 118 – Syslog Settings

To enable the **syslog** remote sending function, click the **edit** button and choose the **enabled** option:

Figure 119 – Configure Syslog Messages

Remote Log Status – choose disable/enable remote log [enabled/disabled].

Host – specify the host IP address where to send the **syslog** messages [host IP address].

Be sure the remote host is configured properly to receive the **syslog** protocol messages.

Level – select the messages level you need to trace. The level determines the importance of the message. The levels are, in order of increasing importance:

Debug – debug messages including more important level messages: [info/warning/error/fatal].

Informational – informational messages including [warning/error/fatal]

Warning – warning condition messages including [error/fatal]

Error – error and critical condition messages including [fatal]

Fatal – critical and fatal condition for device messages. Actions should be taken immediately.

Save – save changes. The syslog messages will be started to send to the specified host.

Cancel – restore the previous values.

System | Configuration | Trace System

The trace system utility debugs system services and protocols if malfunction occur. Trace system works with started services as DHCP, PPTP, PPPoE, telnet and SNMP and shows number of system messages according to the selected history size. The trace system can help operators to locate mis-configurations and system errors. Select **system | configuration | trace system** menu to view current syslog messages in case of troubleshooting of one of the services:

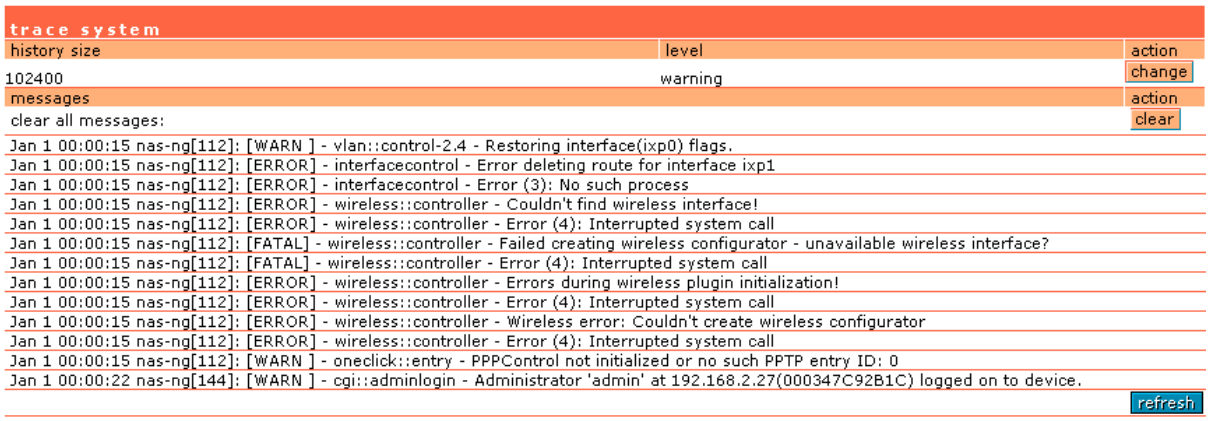


Figure 120 – Trace System

By default, trace system utility is switched on. The latest messages are displayed at the end of the message list.
History Size – select the message history size to display [102400-512000 bytes].

Level – select the messages level you need to trace. The level determines the importance of the message. The levels are, in order of increasing importance:

Debug – debug messages including more important level messages: [info/warning/error/fatal].

Informational – informational messages including [warning/error/fatal]

Warning – warning condition messages including [error/fatal]

Error – error and critical condition messages including [fatal]

Fatal – critical and fatal condition for device messages. Actions should be taken immediately.

Change – click the change button to apply new history size or selected message level. Trace system will start to sort by selected level at once you click the change button.

Clear – delete all displayed messages.
Refresh – click to refresh trace system messages.

System | Configuration | Clock

To set the Hotspot-in-a-Box internal clock, use the **clock** utility, accessed by selecting the **system | configuration | clock** menu link:

Figure 121 – Clock Utility

To adjust the clock settings, click the **change** button:

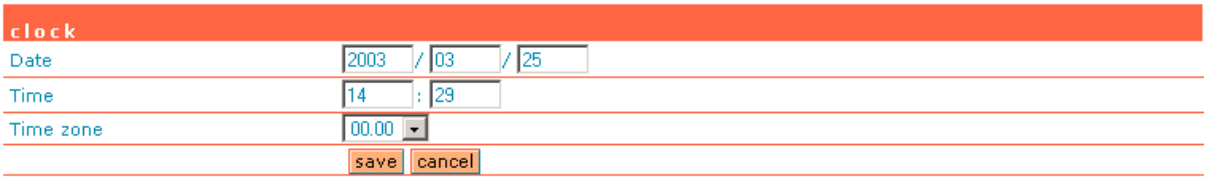


Figure 122 – Set Clock Settings

Date – specify new date value [year/month/day].

Time – specify time [hours: minutes].

Time Zone – select the time zone [-12.00 – 14.00]. If the NTP service is enabled the selected time zone will be applied to the clock settings also.

If the NTP server (see the next section for reference) is enabled on the system, no manual clock setting is available except time zone.

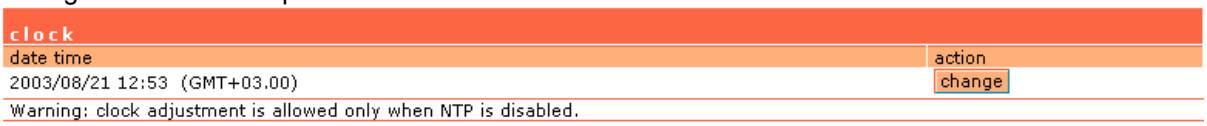


Figure 123 – Clock and NTP

Only time zone change is available when NTP server is used.

System | Configuration | NTP

The **NTP** (Network Time Protocol) is used to synchronize the clock of the AC to a selected time reference. You can synchronize the system clock settings using the **system | configuration | NTP** menu:

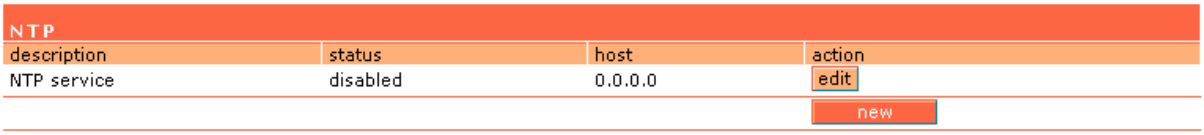


Figure 124 – NTP Service

By default NTP service is disabled. To start the service, click the **edit** button:

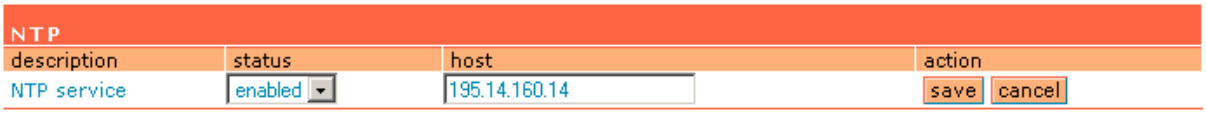


Figure 125 – Enable NTP

Status – select appropriate status for NTP service [enabled/disabled].

Host – specify the trusted NTP server IP on the field. It works only with enabled NTP function.

The NTP synchronize the device clock with GMT + 0 time. If you need to set the time zone, use the **system | configuration | clock** menu.

You may want to add more than one NTP host, for example, in the case where the first host fails to connect. Click the **new** button to add additional host settings:

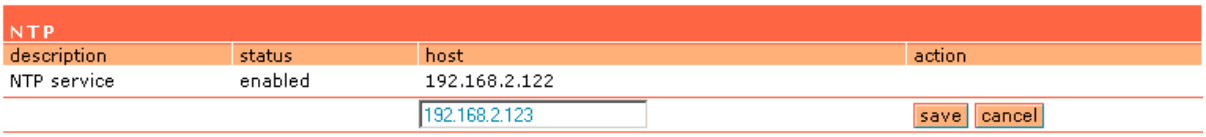


Figure 126 – Add New NTP Host

Host – add additional NTP service hosts [1-128]. This NTP server will be used, if connection to the first defined NTP server is lost.

System | Configuration | Certificate

You can upload your own SSL certificates files for HTTP connection using the **certificate** menu under the **system | configuration** menu:

Figure 127 – Certificate Upload

Only these certificate files are accepted:

- Server PEM-encoded X.509 certificate file
- Server PEM-encoded private key file

Click the **upload** to upload your own SSL **certificates** and **private key** files:

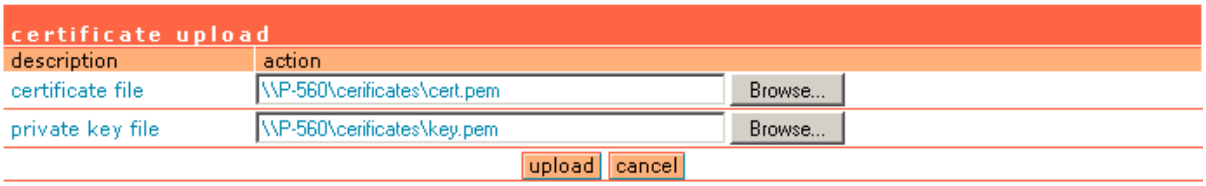


Figure 128 – Upload New Certificate

Certificate File – the PEM-encoded certificate file for the server.

Corresponding **RSA** or **DSA** private keys **SHOULD NOT** be included.

Private Key File – the PEM-encoded private key file for the server.

Private key **SHOULD NOT** be encrypted with a password. This private key should correspond to the certificate above.

Upload – upload new certificates.

Depending on the public key infrastructure implementation, the certificate includes the owner's public key, the expiration date of the certificate, the owner's name, and other information about the public key owner. The default certificate implemented in the AC includes the following:

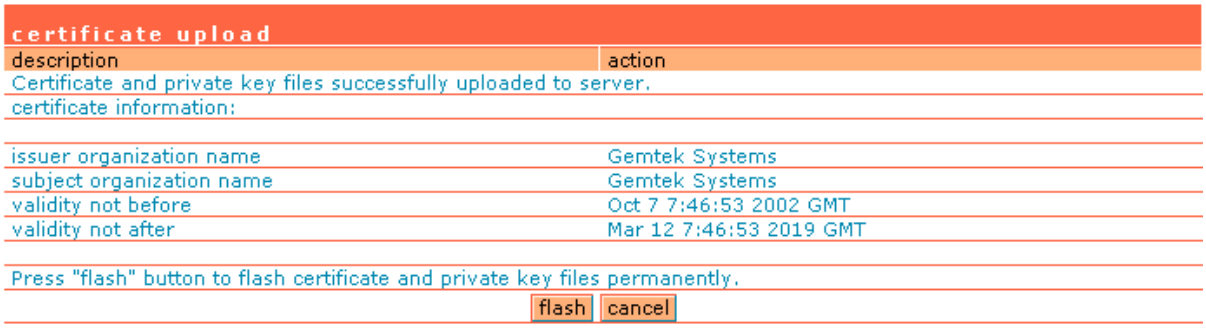


Figure 129 – Default Certificate Properties

Flash – upload new certificates into the controller.

Cancel – cancel new certificate upload.

System | Configuration | Save and Restore

You can save your current device configuration file locally using the **save and restore** menu under the **system | configuration** menu:

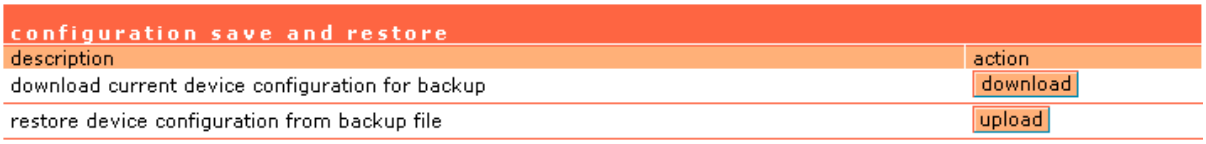


Figure 130 – Save and Restore

Such device configuration is saved in the specific format file (.cfg):

- Network configuration settings (including network interface, VLAN, port forwarding, route, management subnet, DHCP, DNS, RADIUS, tunnels)
- User interfaces configuration settings (including user pages templates)
- System configuration settings (including syslog, NTP configuration, access settings)
- Connection settings (including e-mail redirection and station supervision)

Click the **download** button to start saving the configuration file. You can change or leave the default configuration file description:

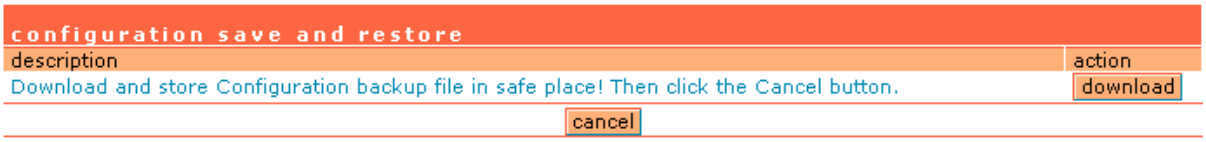


Figure 131 – Edit Configuration File Description

Download – click the **download** once again to save the configuration file under the selected path in your computer. Now the last saved configuration is successfully stored in your local computer.

Cancel – click the **cancel** button to back to main configuration page.

You can use this file any time you want to restore this configuration to the device by using the **upload** button (see: *Figure 130 – Save and Restore)*. Select the configuration file and upload it on the device:

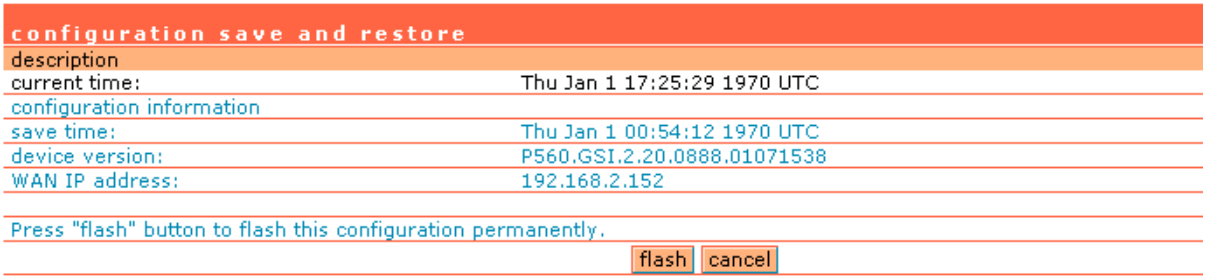


Figure 132 – Upload Configuration File

Flash – click the button to apply configuration setting to the device.

System | Configuration | Pronto

The goal of the pronto-compatible agent program is to ensure that a partner's hotspot is interoperable with Pronto's Hotspot OSS. Pronto compatibility agent is used to download and overwrite current configuration (only some parameters which are listed below) from pronto server using WEB proxy. On device boot only these parameters will be overwritten:

- LAN IP.
- WLAN (wireless LAN) IP.
- LAN DHCP range, DHCP default lease time, max lease time.
- WLAN DHCP range, DHCP default lease time, max lease time.
- WLAN channel.
- WLAN SSID.
- WEP key length (64-bit or 128-bit).
- WEP key format (HEX).
- SMTP server IP and port.
- Location name.
- Walled garden entries.
- Default RADIUS authentication, accounting and accounting backup servers IP.
- Default RADIUS authentication, accounting and accounting backup shared secrets.
- SNMP Read-Only and Read-Write communities.
- SNMP traps host. There will be created 3 traps with different trap types (v1, v2, inform) on the same host.

By default Pronto feature is disabled:

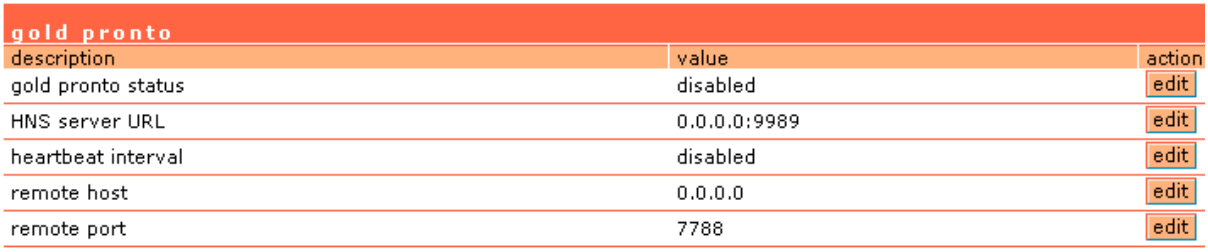


Figure 133 – Default Pronto Settings

Gold pronto status – select pronto compatibility agent status [enable/disable].

HNS server URL – specify HNS server URL.

Heartbeat interval – specify interval between heartbeat messages in seconds: 1-4 numbers [0-3600], no spaces allowed. '0' means that heartbeat is disabled. No heartbeat value specified - system will use external server value. Heartbeat messages are sending between the nodes that indicate a node is up and running.

Remote host – specify remote host [IP address or host name].

Remote port – specify remote host port number: 1-5 numbers, no spaces allowed, [1-65535].

Edit – click to edit required parameter.

Change Pronto status to **enable** and configure the rest Pronto settings. To configure Pronto settings, click the **edit** button next to appropriate parameter and specify value. Reboot the device.

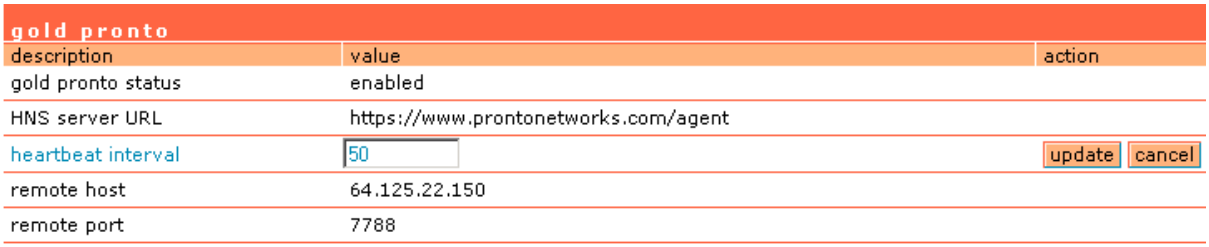


Figure 134 – Configure Pronto Settings

Update – click the button to apply pronto agent settings.

Cancel – restore the previous value.

After reboot device's configuration will be changed automatically.

Note that if Pronto agent is enabled, after reboot existing configuration will be overwritten with Pronto server parameters' values.

System | Access | Access Control

Use the **access control** menu to control the access management to your AC and to specific services. Access control to your device includes access to these services:

- **Telnet**
- **SSH**
- **SNMP**

Thus, the administrator can control the access of a single or every user to the controller via telnet, SSH or SNMP. This can be done by creating the access control list in the AC and checking the incoming user's IP address.

Default access status is used to deny all connections except the SNMP service to the controller. SNMP service is used to access your device via the **KickStart** utility.

Figure 135 – Access Control

Edit – click to edit the default access status [allow/deny].

New – click to create new access control rule for specific network to specific service(s) [all/ /ssh/telnet/snmp].

To configure the access control, click the **edit** button and specify the network address and select services to allow/deny:

Figure 136 –Modify Access Control

Service – select services that access you need to control [all/ssh/telnet/snmp].

Telnet service should be also enabled in the **system | access | telnet** to allow the telnet access to the controller. Otherwise, the client or network will not get telnet access.

Network Address – specify the network or host address with netmask in bit format separated by dash.

The /N stands for the number of bits that are in the network address. There are 32 bits, so we have 32-N bits left that are part of the network. The first N bits of x.x.x.x correspond to x.0.0.0 when N=8, our network address, and the netmask is 255.0.0.0 (when N=8).

bits	netmask
/32	255.255.255.255
/31	255.255.255.252
/30	255.255.255.248
…	…
/26	255.255.255.192
/25	255.255.255.128
/24	255.255.255.0
…	…
/16	255.255.0.0
…	…
/8	255.0.0.0
…	…
/0	0.0.0.0

Access – select the access policy: [allow/deny].

Up to **255** different access control rules can be set.

System | Access | Telnet

When the **telnet** function is switched on, telnet connection to the Hotspot-in-a-Box is enabled and the administrator can connect to the CLI interface via **telnet**.

Make sure that default access status to the administrator PC appears as 'allow' under the **system | access | access control** menu. Otherwise, you will not be able to connect via telnet, even though the telnet function is enabled.

By default **telnet** is disabled:

Figure 137 – Default Telnet Status

To switch the **telnet** function on, click the **edit** button and change the status:

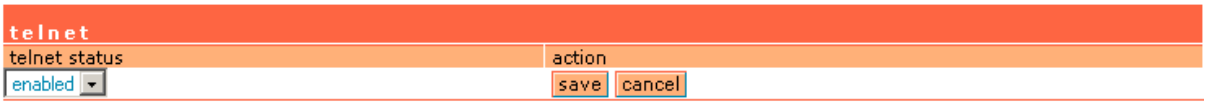


Figure 138 – Change Telnet Status

Enabled – connection via telnet to AC is enabled.

Disabled – connection via telnet to AC is disabled.

Save – click the button to save the configuration.

Cancel – restore the previous value.

System | Access | AAA

It is recommended to use the **Gemtek Systems** product **Smart Client Manager** (S-200) for EAP authentication methods.

Such multimode **Authentication, Authorization** and **Accounting** (AAA) methods are supported on the AC:

- **UAM** – Universal Access Method (web-login) method
- **EAP/802.1x** are:
  - **EAPMD5** – 802.1x authenticator with MD-5 method
  - **EAPSIM** – 802.1x authenticator with SIM authentication method
  - **EAPTLS** – 802.1x authenticator with TLS authentication method
  - **EAPTTLS** – 802.1x authenticator with TTLS authentication method
- **MAC** – user is authenticated from RADIUS server by its MAC address and password.

Use the **user interface | configuration | AAA** menu to enable/disable appropriate authentication method on your controller:

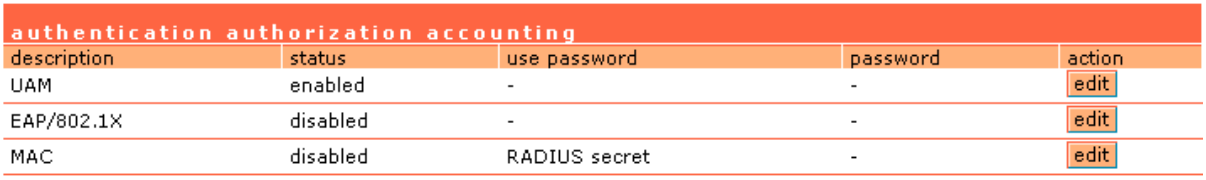


Figure 139 – AAA Settings

If **UAM** (web-login) method is disabled the subscriber will not be able to login through the web interface.

Status – change status of selected AAA method [enabled/disabled].

For **MAC authentication** the following settings are required:

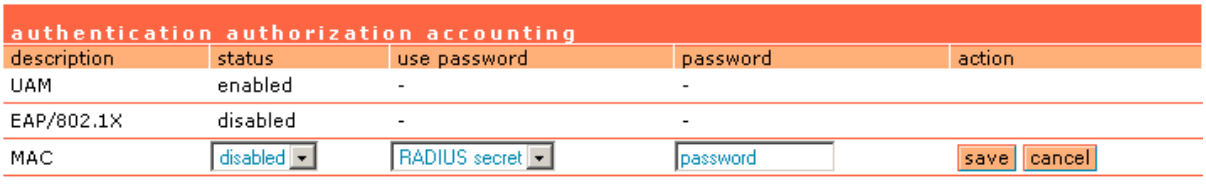


Figure 140 – MAC Authentication

Use Password – select [RADIUS secret] or [User defined] password for user authenticating by its MAC address.

Password – enter password with **user-defined** option selected. Password will be one for all users authenticated by MAC address [string, 4-32 characters, no spaces allowed].

Current **RADIUS secret** value is only displayed and **CANNOT** be changed under the **AAA** menu. To change the RADIUS secret value use the **network interface | RADIUS | servers** menu.

System | Access | UAT

With **Universal Address Translation** (UAT) enabled, the Hotspot-in-a-Box will automatically and transparently translate fixed IP settings (IP address, gateway, DNS, proxy server) on a user's PC so that he can connect to the broadband Internet service. There is no need for end-users to reset their corporate IP or web settings. Also outgoing subscriber e-mails can be redirected to the operator's e-mail server in order to facilitate e-mail forwarding for foreign subscribers.

Universal address translation works only on LAN and VLAN interfaces with **authentication** setting enabled (see more about these settings in the **System | Access | NAV**).

The **Universal Address Translation** (UAT) function can be enabled using the **system | access | UAT** menu. UAT can be configured separately for each interface. All available interfaces are listed:

universal address translation

interface	UAT status	IP address	netmask	action
eth0	disabled	0.0.0.0	0.0.0.0	edit
ixp0	disabled	0.0.0.0	0.0.0.0	edit
vlan0012	disabled	0.0.0.0	0.0.0.0	edit

Figure 141 – Universal Address Translation Settings

VLAN interface will not appear in list if it is not enabled in **Network Interface | Configuration | Interface Configuration** page.

To change UAT settings on interface click the **edit** button in the **action** column. The **status** can be changed now:

universal address translation

interface	UAT status	IP address	netmask	action
eth0	enabled	192.168.4.30	255.255.255.125	
ixp0	enabled	192.168.5.0	255.255.255.32	continue cancel
vlan0012	disabled	0.0.0.0	0.0.0.0	

Figure 142 – Change Universal Address Translation Status

Interface – standard interface name on which UAT can be configured.

UAT Status –universal address translation status [enabled/disabled].

Change **status** or leave in the default state if no editing is necessary and click the **continue** button. Then the IP address and Netmask can be changed:

universal address translation

interface	UAT status	IP address	netmask	action
eth0	enabled	192.168.4.30	255.255.255.125	
ixp0	enabled	192.168.5.150	255.255.255.32	update cancel
vlan0012	disabled	0.0.0.0	0.0.0.0	

Figure 143 – Change Universal Address Translation Settings

IP address – specify network IP of UAT address pool.

Netmask – specify UAT address pool network mask.

Update – update old values with entered ones.

IP address and netmask should be combined and used as pool for users on this interface. Note that count of available IP addresses will become maximum user count on this interface - if there will be no free IP addresses, access will be rejected because of lack of IP addresses.

System | Access | Isolation

Isolation mechanism under the **system | access | isolation** menu increases the security of the AC users.

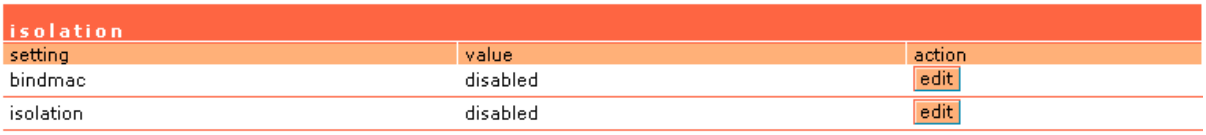


Figure 144 – Isolation

Bindmac – with **bindmac** function enabled, the AC binds the user's MAC and IP addresses together after a successful logon by the wireless client and thereby preventing Internet access to a new user who uses the same client IP address, although be it with a different MAC address [enabled/disabled].

Isolation – enable this function to prevent users on the same LAN to communicate with each other. Users can communicate only through the AC [enabled/disabled].

System | Access | NAV

To change **visitor access** on different LANs or VLANs, **authentication** or **NAT** attributes for AC users, go to the **system | access | NAV** menu:

Figure 145 – NAT, Authentication and Visitor Access

Interface – interface on which the changes will be done [ixp0, non editable].

IP Address – IP address of interface [non editable].

NAT – network address translation service status [enabled/disabled]. If enabled, users can access the Internet under its network gateway address.

Authentication – with disabled authentication, the user from his LAN gets access to the Internet without any authentication. If enabled, authentication for Internet access is required for all users [enabled/disabled].

This setting is important when configuring the **UAT**. See section: **System | Access | UAT** for more details.

Visitor Access – client with specific WISPr attribute can reach the LAN with enabled visitor access [enabled/disabled] (*see more details about visitor access below*).

Only **one selected interface** can have the **visitor access enabled**. Attempting to enable an additional interface for visitor access will **disable** the previous interface.

Visitor Access

Users can be grouped in two logical groups: **employees** and **visitors**. By default, all users belong to the **visitors** group without access to servers in the LAN. **Employees** have access to the Intranet (servers that are running in the LAN), meanwhile **visitors** have access only to the Internet with no way to connect and use services from servers running in the LAN. By default, clients connected on the WLAN and LAN cannot communicate among them-selves. This is prevented by default firewall rules. See the picture below to view the difference between employee and visitor traffic: