GO Metro Broadband Wireless

Getting Started

Technical Guide for WLP

Wireless LAN Pico Base Station

Version 2.2

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Version 1.00

FCC Compliance Status

The following information is for FCC compliance:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following 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.

This equipment has been tested and found to comply with the limits of a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment, this equipment generates, uses, and radiates radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference. However, there is no guarantee that interference will not occur.

To meet regulatory restrictions, the outdoor access point must be professionally installed.

The Part 15 radio device operates on a non-interference basis with other devices operating at this frequency when using its antennas. Any changes or modifications not expressly approved by GO Networks could void the user's authority to operate the equipment.

The antennas used for this transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Table of Contents

Introduction

GO Networks' WLP device is the key enabler for the Metro Broadband Wireless (MBW) Solution. Go Pico Cellular WiFi architecture offers a novel topology for metro WiFi networks which relies on the strengths of innovative XRF™ architectures. This architecture provides the coverage, capacity, and scalability required to deliver next-generation services and overcome the limitations of existing metro WiFi solutions.

The Go Networks' Pico Cellular WiFi architecture is a highly scalable Micro/Pico topology which provides unprecedented flexibility to service providers deploying Metro WiFi networks.

Key Product Features

a. Robust Pico cellular WiFi solution

b. Separate accesses & backhaul radios delivering unmatched bandwidth

c. xRF™ smart antenna engine for unmatched (360^o) coverage and capacity enhancements

d. Advanced automatic mesh

e. Designed for streetlight, wall, or pole deployment

Organization

The GO Metro Broadband *Getting Started Guide* for the Wireless LAN Pico Base Station (WLP) offers information and instructions for quickly installing and configuring the WLP. The instructions and information are presented in one volume as follows:

Introduction	Contains introductory information about the WLP.
GO WLAN Pico Base Station	Presents a general description and overview of the WLP including content and safety procedures.
Installation Process	Describes the installation process for the WLP.
WLP Component and Cable Connections	Describes the WLP component and cable connections.
Configuring the WLP	Describes how to configure the WLP.
Upgrading the WLP Software	Explains how to update the WLP software.
Appendix A	Lists the acronyms that appear in the manual.
Appendix B	Details the wiring specifications.

GO WLAN Pico Base Station (WLP)

The GO WLAN Pico Base Station (WLP) complements the WLAN Sector Base Station (WLS) by delivering street-level coverage and providing capacity enhancements in dense metro areas over a single 802.11b/g channel, while backhauling traffic over multiple 802.11a/b/g radios.

The WLP Base Station delivers omni-directional (360^o) coverage while retaining full xRF smart antenna engine functionality for enhanced capacity and range.

WLP Package Components

The WLP package items are listed in Table 1:

DESCRIPTION	REV	QTY
Wall/Poll Mount Kit Assembly (new)	1.0	1
Connectors Kit for WLP Package	1.0	1
WLP unit	1.0	1
WLP Access Antenna 2.4GHz 7.4dBi Gain, Omni		4
802.11a 10dBi Omni Antenna (Backhaul)		2
Streetlight Power Tap Adapter		1

Table 1: WLP package contents

Deployments of gateway devices connected by wire to an indoor switch/router would include installation of a lightning protector. A lightning protector is not supplied as part of the standard package. It can be ordered from GO Networks as an accessory.

Specific installation may require different Power/Ethernet connections. See WLP Component and Cable Connections for more details.

WLP Safety Information

RF Exposure

The WLP, an outdoor access point, is compliant with the requirements set forth in CFR 47 section 1.1307, addressing RF Exposure from radio frequency devices as defined in OET Bulletin 65. The outdoor access point antennas should be installed to provide a separation distance of at least 3 feet (1 meter) from humans

WLP Lightning Protector

A lightning protector is required when the WLP unit is installed in an outdoor location and the Ethernet cable connects to an indoor network device. The purpose of the lightning protection is to protect people and equipment located indoors from lightning that might strike the WLP or its outdoor cables. Therefore, the lightning protector device should be installed indoors, as close as possible to the point where the cables enter the building.

The lightning protector can also be installed outdoors, as long as the cables that go from the lightning protector to the indoors are well protected from lightning between the box and the building entrance.

Verify that you have shared grounding. GO Networks offers a lightning protector that can be ordered separately.

Installation Process

Installing the WLAN Pico Base Station involves the following steps:

1. Performing a Site Survey
2. Assembling and Mounting
3. Mounting the WLP unit
4. Connecting the Antennas
5. Connecting the cables
6. Powering up the unit and configuring the software
7. Performing a Post-installation Testing Procedure to verify connectivity and operation

Site Survey

Most wireless LANs include many access points installed in various locations in an overlapping radio-cell pattern. It is important to carefully position each access point’s positioning and the assignment of its radio channels. Therefore, a site survey becomes an essential first step before physically deploying the GO MBW WLP Pico Cellular Base Station solution.

Installation of the access points requires a backhaul to interface the corporate network or Internet. This backhaul connection can be a mesh configuration, an Ethernet-wired connection, or a third-party solution. When using any method other then a wired connection, keep in mind the WLP has to have a good reception on its BH side so it will not limit the access-channel performance.

Conclude the site survey with a detailed plan of the MBW system deployment. The system deployment plan should include WLP mounting points and the routes for the power and backhaul cables.

Note: When mounting the WLP on a pole (or wall mount), the pole should be able to support four times the weight of the WLP, as well as the wind loading created by the WLP.

Since the mounting structure itself is a potential source of interference, the cell should be mounted with at least 4 feet of clearance between the antennas and the mounting structure.

Assembling and Mounting

The universal mount is used to attach and secure the WLP to a wall, a lamppost, or a variety of poles.

The WLP mounting consists of the following stages:

a. Securing the mounting brackets to a wall, lamp post, or pole.

b. Connecting the WLP unit to the brackets using the ‘L’ adaptor.

c. Aligning the WLP unit.

Table 2 lists the universal mount parts:

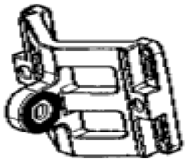
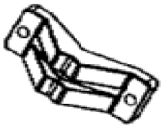
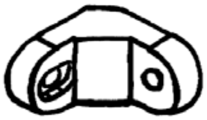
Item No.	Description	Qty	Picture
A	Wall/poll bracket	1	
B	Clamping bracket	1	
C	WLP ‘L’ adapter wall/poll mount	1	
D	Bolt M8x70	2	
E	Screw Hex Cap M8 x25	1	
F	Bolt M8x40	1	
G	Washer flat M8	3	
H	Washer spring M8	4	
I	Nut M8	1	

Table 2: Mounting Kit Part List

First connect the ‘L’ adaptor [C] to the WLP unit. As seen in Figure 1, the ‘L’ adapter is connected using an M8 [E] bolt, a washer spring [H], and a flat washer [G]. You must connect the ‘L’ adaptor on its normal-hole side and not on it grooved side.

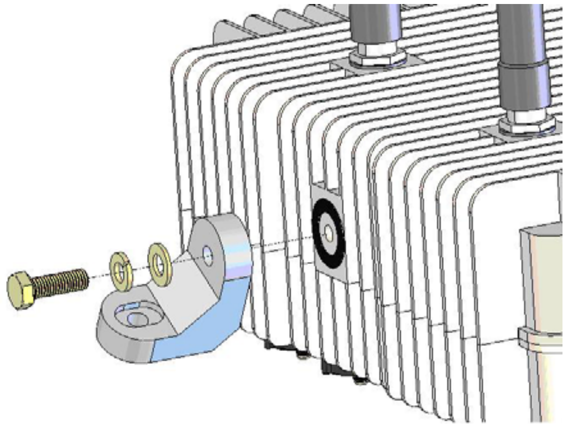


Figure 1: Mount ‘L’ Assembly

After preparing the unit with the ‘L’ adaptor, install the brackets. Assembly of the mounting brackets in a lamppost or a pole installation differs according to the width of the pole. Use two M8 bolts [D] with spring washers [H] to install the brackets onto narrow (1”–1.75”) and normal (1.75”–3”) poles, as illustrated in Figure 2. For poles larger than 3” in diameter, install the bracket using 13 mm width hose clamps (not supplied with the unit).

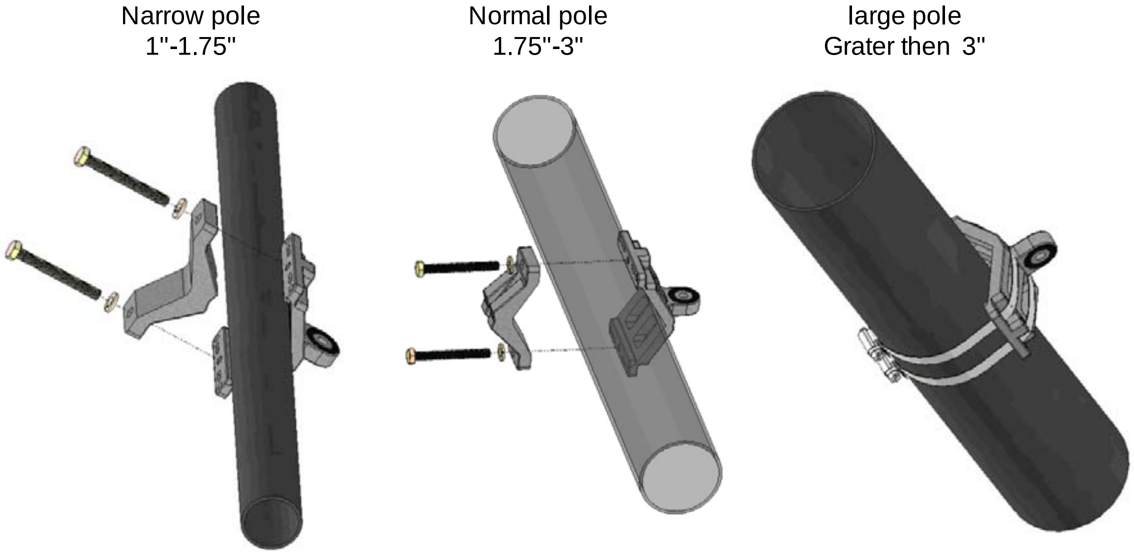


Figure 2: Pole Bracket Assembly

When mounting the WLP unit to a wall, use four 5 mm bolts to secure the bracket [A], using the holes seen in Figure 3. Wall-mounting bolts are not supplied with the unit.

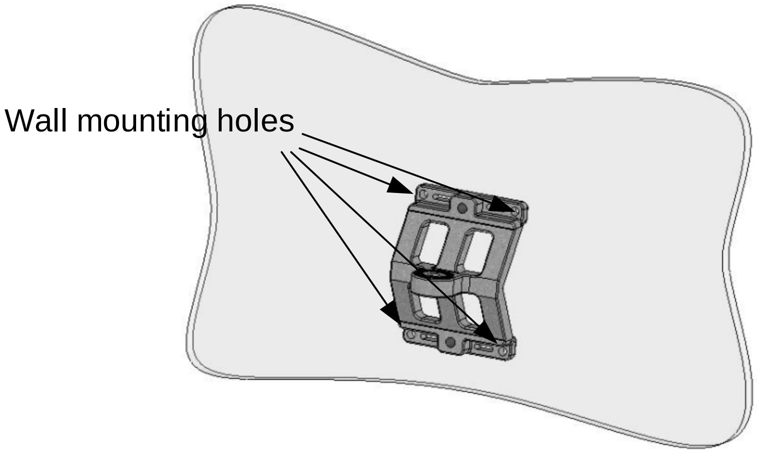


Figure 3: Bracket Wall Mounting

After assembling the brackets, mount the WLP unit on to the bracket as seen in Figure 45. To accomplish this, use an M8 bolt [F] inserted to the grooved side of the 'L' adaptor, a flat washer [G], a spring washer [H] and a nut [I].

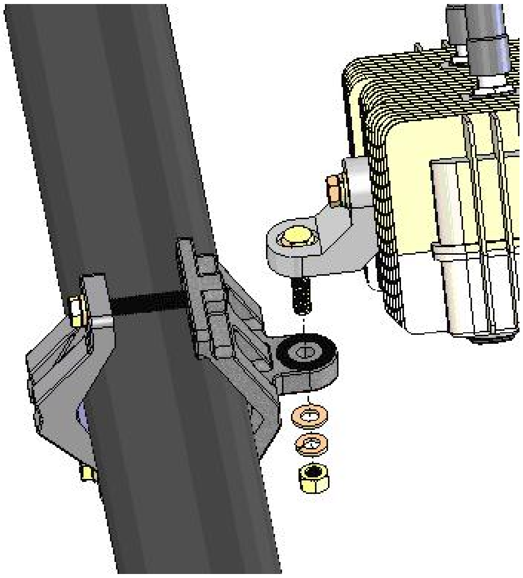


Figure 4: WLP Unit Mounting

Once the WLP unit is mounted, release the bolts slightly and align the WLP unit horizontally, as seen in Figure 56. When the unit is perfectly aligned, firmly close all bolts, applying 120 lbs-inch of tilting torque.

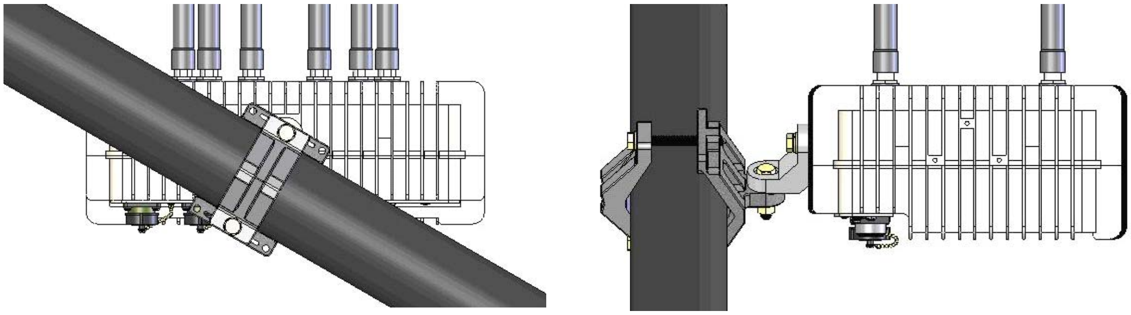


Figure 5: Aligning the WLP

Mounting the Antenna

Integral N-male connectors are used to mount the antennas on top of the WLP. The WLP holds four WiFi antennas for user access, operating on the 2.4 GHz band marked A1 to A4, and two antennas used for the mesh networking connections, operating on the 5.8 GHz band marked B1 and B2.

Screw all antennas into place by hand. Do not apply excessive force while using any tools as this may damage the unit.

Cable Connections

The WLP unit connections are very simple and can be accomplished in only a few minutes. When aligned, the WLP connecters are at the bottom of the unit.

Cable requirements are often unique to the location and deployment topology of each installation. As a result of this limitation, the Ethernet and grounding cables are not included in the installation kit.

The following cables are required to install the WLP unit and should be connected in the following order:

1. **Grounding Cable**:

   Provides the necessary safety functions.

2. **Ethernet Cable** (required only in units connected to the wired network):

   CAT5 shielded; maximum length: up to 100 meters

3. **Power Cable**:

   The supplied AC power cable is deigned to connect directly to a lamppost power-tap feed.

4. **RS-232 Console Cable:** (The device might be pre-configured, so console connection isn't required in the installation site.)

   To connect the WLP to a console (laptop computer) for configuration.

Grounding Cable

The grounding cable should be connected to the grounding screw at the bottom of the unit. Use a 1 mm / 18 awg grounding cable.

Note: Connect the grounding cables before connecting any other cables. Do not remove the grounding cable when other cables are connected.

Ethernet Connection

Ethernet connection is used for wired backhaul connection or an interface to a third party wireless BH solution.

Power Connection

Figure 6 illustrates how the WLP unit is connected to main outlet via the Auxiliary Power Adapter.

Figure 6: Power Connection

Release the photo-cell (also called the photo-control) installed on the pole. Insert the Auxiliary Power Adapter instead of the photo-cell. Connect the Auxiliary Power Adapter cable to the power connector of the WLP.

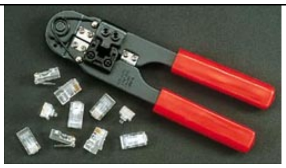
Console Connection

Figure 7 illustrates the RS-232 cable connections used to connect the WLP to a console (notebook computer to configure the WLP).

Hardware and Connectors Installation Tools

The following tools and equipment are required to mount the WLP on a pole.

Table 3: Mounting Tools and Equipment

Ratchet (13 mm.)	13 mm.
RJ45 crimp tool	 HT-210A

Power Up and Software Configuration

The WLP unit is normally mounted on a high pole (or wall) where it is inconvenient to configure. However minimal connectivity must be verified so the unit can later be configured and monitored from the ground. In order to verify connectivity when installing the device, root devices must be installed and powered up first.

The connectivity of the root device can be verified by the Ethernet ACT LED. The root device MESH LED should also be on, indicating the device is ready to connect wirelessly. When powering up a non-root device, the MESH LED should be lit to indicate the device is connected wirelessly. WLP boot time is about 2.5 minutes. The MESH LED indicator will light up after the boot is completed.

Post-installation Testing Procedure

The purpose of the post-installation testing procedure is to verify connectivity between the WLP and the network.

It is recommended that you perform the following tests:

1. Ping the device.
2. Establish telnet access and ping the access controller or the network from the WLP unit CLI.

Configuring the WLP

Following is a brief overview of the main CLI commands that are used to configure the WLP. A configuration example follows the detailed list of configuration commands. These and other CLI commands are detailed in the *GO MBW CLI Reference Guide*.

Connect and Access the WLP

Initial configuration of the WLP is done using a serial cable. A standard RS232-interface DB-9 cable is connected to the COM port of a laptop or a PC to the WLP unit's console port. For more information regarding the serial cable, see *Appendix B, Wiring Specifications*.

Once the WLP IP address is configured, the rest of the configuration can be done using Telnet via the network.

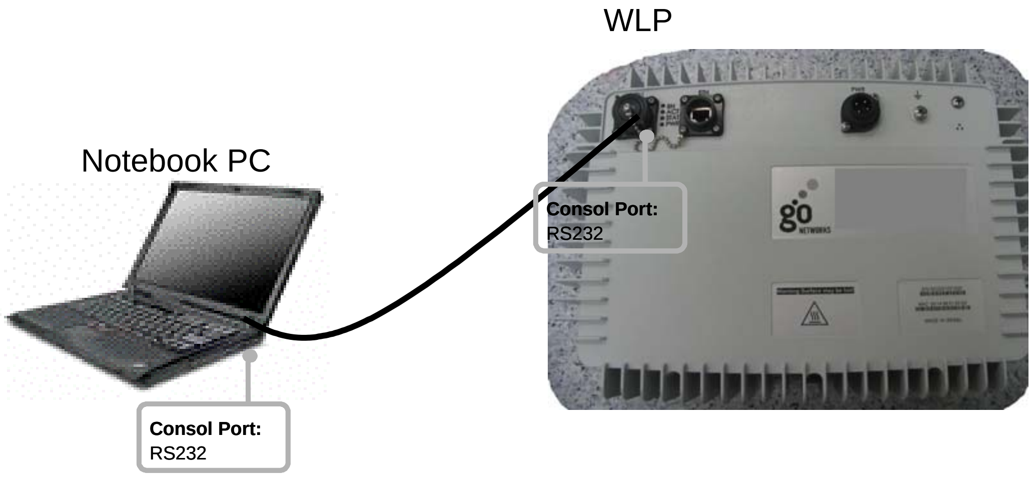


Figure 7: Connect and Access the WLP

Once the cable is connected, you can then operate a terminal program, such as HyperTerminal. The PC port should be configured as follows:

d. Baud rate = 9600

e. Data bits = 8

f. Parity = none

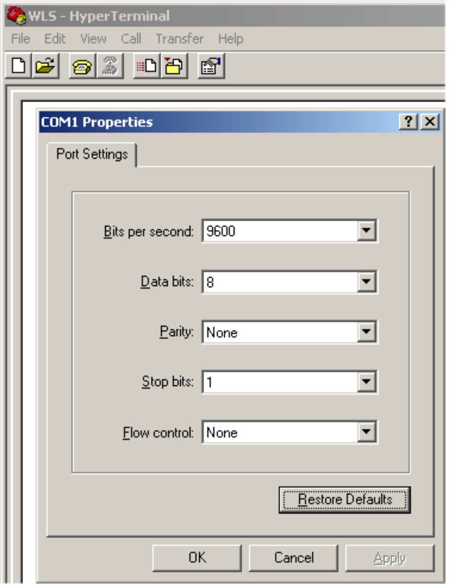
g. Stop bits = 1

h. Flow control = None

To use HyperTerminal:

From the Start menu:

1. Select **All Programs > Accessories > Communications > HyperTerminal**.
2. Define a new connection.
3. Right-click and select **Properties**. Set or verify the above values.
4. Click OK.



COM1 Properties

Port Settings

Bits per second: 9600

Data bits: 8

Parity: None

Stop bits: 1

Flow control: None

Figure 8: HyperTerminal

5. Establish the connection between the WLP and the laptop (or PC).
6. Log in using the predefined “super” user (user: super; password: super).

The user name determines what authorization level the operator has and, in turn, determines whether you can view configuration and operation parameters, or implement changes. A new user and password name should be added; however this default name and password can be used for the initial configuration.

The default system name for the unit is set to **WLS**.

Configuring the Management Connectivity

Configuring the management connectivity involves setting the Fast Ethernet connection as well as defining the default gateway. These procedures are detailed in the following section.

Define the static IP address and the subnet mask on the same network through which you connect to the WLP. You can use the CLI command: `configure ip address <ip address>`, as shown below:

```
configure ip address 192.168.30.102 255.255.255.0
```

The default is IP is fixed on 192.168.0.10

Note: If you are using DHCP client on the first gateway, you do not need to configure the default gateway.

Default Gateway

Define the default gateway by using the Configure mode (consult with your network administrator). You can use the CLI command: `configure ip default-gateway <ip address> disable/enable, as` shown below:

```
configure ip default-gateway 192.168.30.254
```

Note: If you are using DHCP client on the first gateway, you do not need to configure the default gateway.

Configuring the Radio Settings

By default, the channel is configured to channels 1 (2.412 GHz). You can define different configurations for each channel by using the following CLI command:

```
configure interface dot11Radio 0 channel 6
```

Setting the Radio Data Rates

By default, the channels are defined for use in a mixed mode. You can select a rate per channel for one of two states: g or mixed (a combination of g and b). The following CLI command syntax is used:

```
configure interface dot11Radio 0 mode [g | mixed]
```

Configuring Multiple SSIDs

The SSID is a unique identifier that wireless networking devices use to establish and maintain wireless connectivity. Multiple access points on a network or sub-network can use the same SSID. Configuring the same SSID across multiple APs will enable the users to roam between them seamlessly. SSIDs are case sensitive and can contain up to 32 alphanumeric characters.

You can configure up to 16 SSIDs on your WLS. Each SSID has its unique privacy configuration and unique VLAN ID. VLAN-ID 0 represents no VLAN tag.

Each SSID can be defined as either a Broadcast SSID (BSSID) or a hidden one. Passive scanning clients will not detect a hidden SSID, since it doesn’t transmit any beacon frames. Configuring multiple BSSIDs on the same interface is known as creating a **Virtual Access Point**. A **Virtual Access Point** is a logical entity that exists within a physical access point. When a single **Physical AP** supports multiple **Virtual APs**, each **Virtual AP** appears to stations to be an independent **Physical AP,** even though only a single **Physical AP** is present.

Note: SSIDs, VLANs, and encryption schemes are mapped together on a one-to-one-to-one basis. One SSID can be mapped to one VLAN, and one VLAN can be mapped to one encryption scheme.

Define the SSID parameters. This configuration stage is common to SSID to be used as primary (broadcast) or hidden. In the following example, three SSID’s are defined as GO-WLS1, GO-WLS2, and GO-HIDDEN, each with its own VLAN-ID, and no privacy.

```
WLS> configure ssid 1 name GO-WLS1 vlan 0 privacy-method none
type bssid
WLS> configure ssid 2 name GO-WLS2 vlan 0 privacy-method none
type bssid
WLS> configure ssid 3 name GO-HIDDEN vlan 1 privacy-method
none type hidden
```

The next step is to apply the defined SSIDs for the interface:

```
WLS> configure interface dot11Radio 0 ssid add 1
WLS> configure interface dot11Radio 0 ssid add 2
WLS> configure interface dot11Radio 0 ssid add 3
```

Enabling the Radio Interface

By default, the WLP radio is disabled. You can, however, choose to enable it using the following CLI command syntax:

```
configure interface Dot11Radio 0 [disable | enable ]
```

Note: You can't enable the wireless interface until at least one BSSID is attached to it.

Configuring the WDS

WDS protocol is used to support wireless backhauling and meshing of WLP and CPE units. WDS is supported over both the 2.4 GHz access radio and the 5 GHz backhaul radio.

In the section below, the following terms will be used:

i. **Peer** — A WDS unit. An AP, which support the WDS feature.

j. **Root** — A peer that is connected to the Ethernet.

k. **Hop1** — A "non-root" peer that is connected to a root.

l. **Hop2/3 …** — A "non-root" peer that is connected to a Hop1/2 …

m. **Parent-Child** — Two peers which are defined by the WDS connection. The parent is the peer giving Ethernet access to the child peer.

The WDS topology is based on a tree structure as illustrated in Figure 9, meaning, in a given time each peer has one Parent. Root has no Parent since it is the head of the tree. WMG and third party CPEs will normally connect at the bottom of the tree. Clients may connect to any AP in the tree.

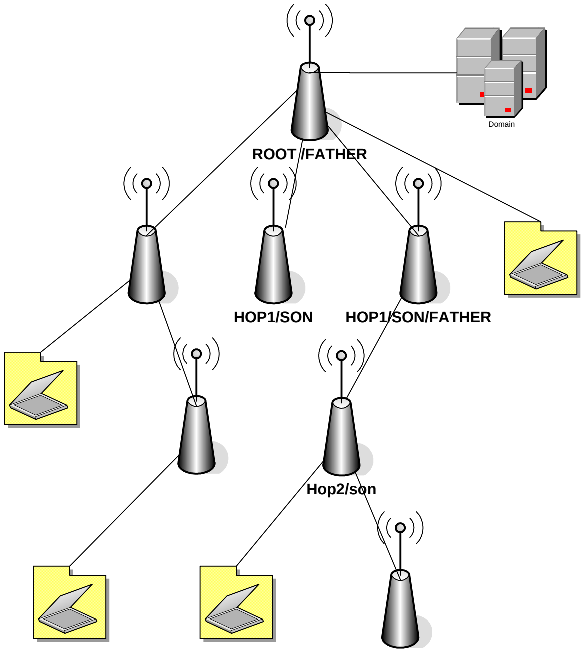


Figure 9: WDS Tree

The WLP supports two modes of WDS operation: Manual and automatic topology detection.

Manual Mode — Connection between two peers is done by manually entering each peer MAC address. Once the MAC address has been entered, the two peers are WDS-connected.

Automatic Mode (AWDS) — Connection between two peers is done by automatically discovering the father and establishing the connection between the two peers.

In automatic mesh topology detection (AWDS) mode, the WLP will route the traffic using the best route when more then one route exists. In a similar way, the AWDS will recover from a fault by selecting an alternate route when needed.

A non-root WDS WLP is not connected to the wired LAN. A non-root device relies on the WDS mesh network for connectivity. A non-root WDS WLP routes to the root WDS WLP with which it has the best connectivity. However, you can manually override the AWDS by specifying the path to which the WDS routes.

It is important to note that the number and quality of hops will determine the network performance. In most cases, the physical deployment of the devices is the limiting factor in route selection.

WDS root configuration is controlled by:

```
configure wds root [ true | false ]
```

To display the current WDS configuration use:

```
show wds params
```

WDS is always used on the BH radio while the access radio can be configured to use as Access-only, pure backhauled, or mixed operation by the following command:

```
configure interface dot11Radio 0 service [access | backhaul |
both]
```

To activate the automatic topology detection mode (meshing mode) the user has to enable this mode at both devices he wishes to connect and configure them to the same radio channel. Automatic WDS topology detection is currently supported on the BH radio or the access radio. Trying to configure both radios to automatic mode will result in an error message. To enable automatic mode use:

```
configure interface [dot11radio | BHRadio ] 0 wds-auto-
discovery enable
```

Once automatic mode has been enabled, the route candidates can be viewed using:

```
show WDS candidates
```

The current parent, active children, and static-defined peers can be viewed using:

```
show WDS nodes
```

To configure the WDS connection manually, use:

```
configure wds add peer <MAC Address>
```

Note: This command is used only for non-root WLP.
Note: Manual configuration can result in network loops.

The WDS connection can be protected by configuring the WDS privacy. The user must configure all the units he wishes to connect with identical privacy settings. WDS privacy is configured by:

```
configure interface [BHRadio | Dot11radio] 0 wds-privacy {
none | { wep key { 40 | 104 } < key hex(10|26) > } | { wpa
passphrase < passphrase string(8-63) > } }
```

For example, configuring WEP privacy for the BHRadio will use:

```
configure interface BHRadio wds-privacy wep key 40
11:22:33:44:55
```

Configuring Authentication Types

In the most common 802.1X WLAN environments, the WLP units defer to the Radius server to authenticate users and to support particular EAP authentication types. The Radius server handles these functions, and provides crucial authentication and data-protection capabilities according to the requirements of the EAP authentication type in use. The Radius client runs on the WLP device and sends authentication requests to a central Radius server, which contains all user authentication and network service access information. The Radius server is normally a multi-user system running Radius server software (such as developed by Microsoft or other software vendors).

The wireless client device and Radius server on the wired LAN use 802.1x and EAP to perform mutual authentication through the WLP.

1. The Radius server sends an authentication challenge to the client.
2. The client uses a one-way encryption of the user-supplied password to generate a response to the challenge and sends that response to the Radius server.
3. Using information from its user database, the Radius server creates its own response and compares that to the response from the client.

When the Radius server authenticates the client, the process repeats in reverse, and the client authenticates the Radius server.

Configuring the Radius Client in the WLP

Your WLP must be configured to support the Radius server communication. At a minimum, you must identify the Radius server software and define the method lists for Radius authentication. Alternatively, you can define method lists for Radius authorization and accounting.

Identifying the Radius Server

WLP-to-Radius server communication involves several components:

a. IP address

b. Authentication destination port

c. Accounting destination port

d. Key string

You should identify the Radius security server's IP address and specific UDP port numbers. The combination of the IP address and the UDP port number creates a unique identifier.

A Radius server and the access point use a shared secret text (key) string to encrypt passwords and exchange responses.

You can configure the Radius client in the WLP by using the following command:

```
configure radius-server [primary | secondary] [authentication |
accounting] <port  1 – 65535> host <IP address> key <secret 5 –
64 string> enable
```

Configuring Privacy Methods

The privacy (encryption) scheme is configured per ESSID.

Using WPA Key Management

WiFi Protected Access (WPA) is a standards-based, interoperable security enhancement that strongly increases the level of data protection and access control for existing and future wireless LAN systems. It is derived from and will be forward-compatible with the upcoming IEEE 802.11i standard. It includes two new data-confidentiality protocols (TKIP and AES-CCMP).

WPA leverages TKIP and AES-CCMP (Temporal Key Integrity Protocol and Cipher Block Chaining Message Authentication Code Protocol) for data protection and 802.1X for authenticated key management.

WPA1 and WPA2 offer a high level of assurance for end users and network administrators that their data will remain private and that access to their networks will be restricted to authorized users.

WPA key management supports two mutually exclusive management types:

e. **WPA-Extensible-Authentication-Protocol (WPA-EAP):** Using WPA-EAP key management, the client and the authentication server authenticate each other using an EAP authentication method, and the client and server generate a Pairwise Master Key (PMK).

f. **WPA-Pre-shared key (WPA-PSK):** Using WPA, the server generates the PMK dynamically and passes it to the WLP. Using WPA-PSK, however, you configure a pre-shared key on both the client and the WLP, and that pre-shared key is used as the PMK.

You can configure the WPA key management in the WLP using the following command.

```
configure privacy wpa { { < ssid integer(1-16) > [ passphrase <
passphrase string(8-63)> ] [ key-mngmnt { eap | psk } ] } | { [
gtk-interval < interval integer(30-42949672) > ] [ data-
encryption { tkip | aes } ] [ protocol { wpa1 | wpa2 | wpa2only
} ] [ preauthentication { enable | disable } ] } }
```

Saving the Configuration

Once you have modified the existing configuration file, you should save it for future use. To do this, issue the following CLI command:

```
copy running-configure startup-configure
```

WLP Configuration Example

```
WLP > configure ip address 192.168.30.102 255.255.255.0
WLP > configure ip default-gateway 192.168.30.254
WLP > configure interface dot11Radio 0 channel 1
WLP > configure ssid 1 name GO-WLP vlan 0 privacy-method none type
bssid
WLP > configure interface dot11Radio 0 ssid 1 add
WLP > configure interface dot11Radio 0 mode mixed
WLP > configure interface dot11Radio 0 enable
WLP > copy running-config startup-config
```

Upgrading the WLP Software

Periodically, new software upgrades are released in order to provide feature enhancements and maintenance. Following is one method you can use to update the software:

g. Initiate the network download using a TFTP download server.

Note: The WLP unit has two banks in the Flash memory (sw0, sw1). By default, the WLP will startup the software image from the sw1 bank.

Initially, when you download the new software image, the older version is automatically transferred to sw0 bank, and the new software image is transferred to sw1 bank.

Upgrade Example

```
WLP>
WLP> import image from tftp [IP ADDRESS] [File Name]
WLP> show messages software-download
Software download started.
Verifying server and path.
TFTP path OK.
Flash erase started.
Flash erase finished.
Download started from 192.168.30.103 gapsw-1.3.5.11995-Beta-
28.02.2006@180244.img.
Download finished.
Verification started.
Verification passed.
Writing to environment.
Software download finished.
```

Note: It is important to reload the system after upgrading the WLP software for the changes to be applied and the new software to become operational.

You may need to copy a new image to the Flash memory whenever a new image or maintenance release becomes available.

To copy a new image into Flash memory (write to Flash memory):

a. Use the import image from tftp command.

b. The system is now ready to be reloaded. After reload, the system will operate with the new image.

Appendix A: List of Acronyms

Acronym	Explanation
802.11	A family of specifications related to wireless networking, including: 802.11a, 802.11b, and 802.11g.
AP	Access Point. The hub of a wireless network. Wireless clients connect to the access point, and traffic between two clients must travel through the access point. Access points are often abbreviated to AP
BSSID	Broadcast Service Set Identifier
DHCP	Dynamic Host Configuration Protocol. A protocol which enables a server to automatically assign an IP address to clients so that the clients do not have to configure the IP addresses manually.
EAP	Extensible Authentication Protocol. A standard form of generic messaging used in 802.1X.
ESSID	EGOed Service Set Identifier
PMK	Pairwise Master Key
SSID	Service Set Identifier, a set of characters that give a unique name to a WLAN.
TKIP	Temporal Key Integrity Protocol
VLAN	Virtual Local Access Network
WDS	Wireless Distribution System
WEP	Wired Equivalent Privacy. An encryption system created to prevent eavesdropping on wireless network traffic.
WLP	Wireless Base Station. Access point of the GO Networks MBW solution.
WNC	Wireless Network Controller of the GO Networks MBW solution.
WPA	WiFi Protected Access. A modern encryption system created to prevent eavesdropping on wireless network traffic. It is considered more secure than WEP.

Acronym	Explanation
WPA-EAP	WPA-Extensible Authentication Protocol
WPA-PSK	WPA-Pre-shared key

Appendix B: Wiring Specifications

Table 4: Console Port Signaling and Cabling with a DB-9 Adapter for the WLP Unit

Console Port (DTE)	RJ-45-to-RJ-45 Straight Cable		RJ-45 to DB-9 Terminal Adapter	Console Device
Signal	**RJ-45 Pin**	**RJ-45 Pin**	**DB-9 Pin**	**Signal**
No connection	1	1	8	CTS
No connection	2	2	6	DSR
No connection	3	3	5	GND
GND	4	4	5	GND
RxD	5	5	3	TxD
TxD	6	6	2	RxD
No connection	7	7	4	DTR
No connection	8	8	7	RTS