C1004W - 10G EPON ONU
Installation and User's Guide

■ Version 1.9

COMMSCOPE®

Table of Contents

Safety Precautions

Warning Before you install the C1004W unit, read this section. Product installation should be conducted only by professional installer who has been accurately trained.

Electrical safety

- Always use caution whenever handling live electrical material and contacts.
- Do not install electrical equipment in wet or damp conditions.
- Ensure that the power source for the unit is adequately rated to assure safe operation and provides current overload protection.
- Do not allow anything to be put on the power cable, and do not place this unit where people will stand or walk on the power cable.
- This unit should be used with the approved power adaptor which is included in the product package.

Warning Do not open the enclosure without Commscope's permission and technical support, which voids the warranty.

Laser safety

- Use of controls or adjustments, or performance of procedures other than those specified herein may result in hazardous laser radiation exposure.
- To avoid exposure to radiation, do not stare into the aperture of a fiber-optic port. Invisible radiation might be emitted from the aperture of the port when no fiber cable is connected.
- Do not bend the optic fiber cables severely, which may damage the fiber or prevent the signal from being transmitted properly.
- Always keep unused fiber-optic ports capped with a clean dust cap.

Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Never stare into beams or look directly to optical connectors.

Preventing EMI

- When you run wires for any significant distance in an electromagnetic field, electro magnetic interference (EMI) can occur between the field and the signals on the wires.
- Bad plant wiring can result in radio frequency interference (RFI).
- If Strong EMI occurs in the installation place, consult RFI experts to get rid of it.

Accessibility Safeguards

Warning	Never use “Administrator” nor “Operator” login account except professional installer!

Warning	Supplier will not be liable for any damage or misoperation caused from incautious configuration attempted by end user who tries with “Administrator” or “Operator” login account.

Grade on accessibility

- Three login accounts are available as per their own authority and capability.
- “Administrator” account gives the top most authority and “User” account gives the least.
- The account information is presented in this manual but this does not mean any end user may dare to configure the unit.
- This product must be installed and configured by professional installer only.
- Should there be any mis-configuration made upon the device (e.g. RF band selection or country selection) by end user the device would not operate properly.”

Product Introduction

C1004W is a single family unit type ONU which has a 10G EPON uplink and 4 Gigabit Ethernet ports for service as well as dual band WiFi interfaces. Each service port can support upto 1 Gbps bandwidth meanwhile WiFi interface supports IEEE 802.11 b/g/n/ac. Besides, OAM functions like remote detection/configuration via ACS, web configuration and QoS control features are also obtainable for smoother operation and maintenance.

Features

- Various speed combination supported
  - Diverse Downstream/Upstream speed sets for the uplink segment are available
    - 10Gbps / 10Gbps
    - 10Gbps / 1Gbps
    - 2Gbps / 1Gbps (Turbo mode) - planned
    - 1Gbps / 1Gbps - planned
  - Uplink segment means the portion between OLT and ONU.

  [Note] 2Gbps / 1Gbps (Turbo mode) and 1Gbps / 1Gbps are only available provided that appropriate optic module is equipped at the corresponding OLT port.
- Compliant to cablelab's DPoE specification
  - Right for the MSOs who want to migrate to EPON technology
- Management via efficient OAM
  - Remote detection and configuration by way of TR-069 (planned)
  - EPON OAM
  - Authentication
  - Charging
- Dualband wireless access in concurrent manner
  - IEEE 802.11 ac as well as b/g/n are supported.
    - At 2.4 GHz: IEEE 802.11 b/g/n
    - At 5 GHz: IEEE 802.11 ac
- Local Configuration via web GUI
  - For monitoring and settings

Appearance

Figure 1 Front view of C1004W

- Designed to be installed either wall mount or the desk placement.
- Physical dimension & weight
  - 288.50(W) x 186.6(D) x 150.00(H) mm
  - 820g
- Power adapter
  - Input: 100 ~ 200VAC, 50 ~ 60 Hz
  - Output: 12VDC, 3A

Ports

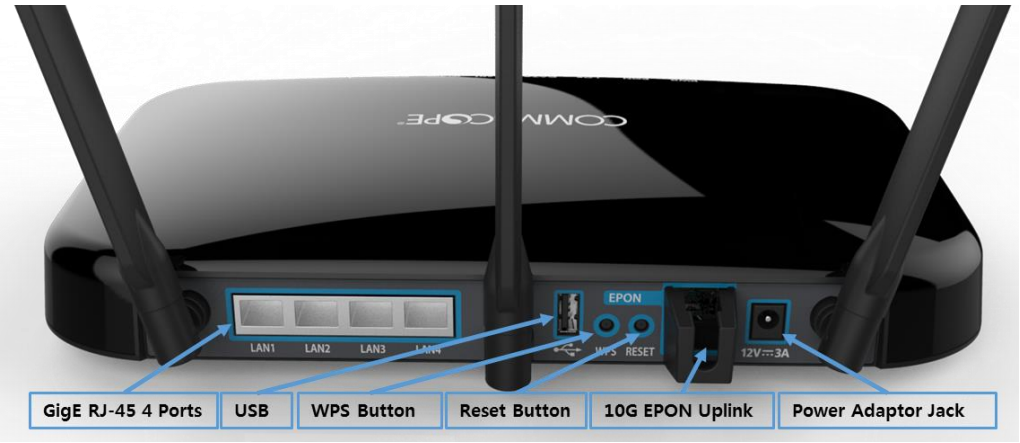


Figure 2 Rear view of C1004W

Table 1 Descriptions of the ports on the rear panel of the C1004W

Port and Button	Function
Four Gigabit Ethernet ports	Four 10/100/1000Base-TX ports used for service connection
USB port	Updated system image is downloaded via this. (To be operational in MP version)
WPS button	Activate Wi-Fi Protected Setting
Reset button	Press for 1~3 seconds to reset the unit. Press for more than 15 sec to get back to factory default setting.
10G EPON Uplink	10G EPON ports (SFP+ type) used for uplink connection
Power adapter jack	Hole for the power inlet from PA.

LEDs

Figure 3 Top view of C1004W

Table 2 Descriptions of the LEDs on the front panel of the C1004W

Silk Screen	Name	Status	Indication
PWR	Power supply LED	Green On	Power is fed.
		OFF	No power is fed.
PON	Authentication LED	Green On	10G/10G (DS/US) Link On
		Blue On	10G/1G (DS/US) Link On
		OFF	Link Off
LOS	Loss of Signal	Purple On	Optic transceiver is NOT equipped.
		Red On	PON Link is NOT established properly. Or, continuous optic signal is detected.
		OFF	PON Link is established properly. I.e. in normal status.
DATA	Data port LED	Blue Blink	Packets are being transmitted between OLT and ONU.
		OFF	No packets are being transmitted between OLT and ONU.
WLAN1	WLAN1 port LED	Blue On	5G Wi-Fi is in Active status.
		Blue Blink	5G WPS is in operation.
		OFF	5G Wi-Fi is in Inactive status
WLAN2	WLAN2 port LED	Blue On	2.4G Wi-Fi is in Active status.
		Blue Blink	2.4G WPS is in operation.
		OFF	2.4G Wi-Fi is in Inactive status.
WPS	WPS port LED	Blue Blink	WPS is in operation
		Off	WPS is NOT in operation
USB	USB port LED	Blue On	USB device is attached

Contents of the Package

C1004W

Transceiver module

Power Adapter

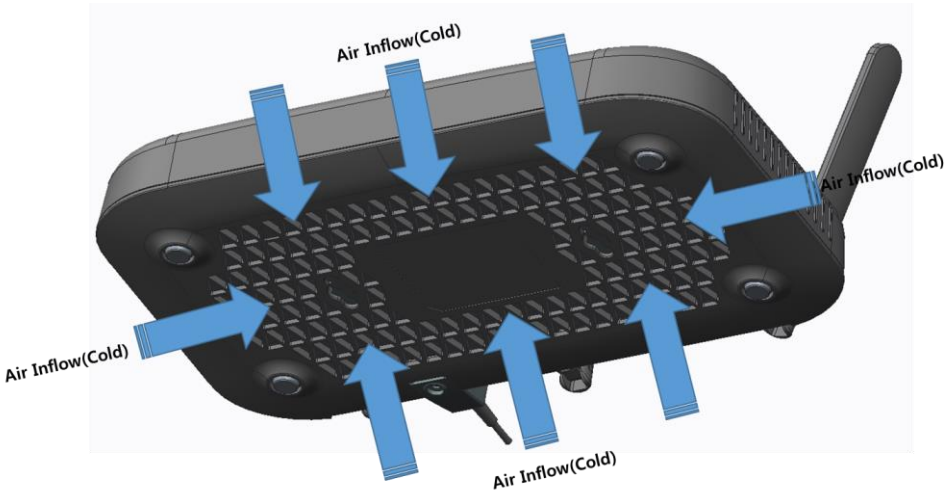
Ethernet Cable

Star-shaped screws

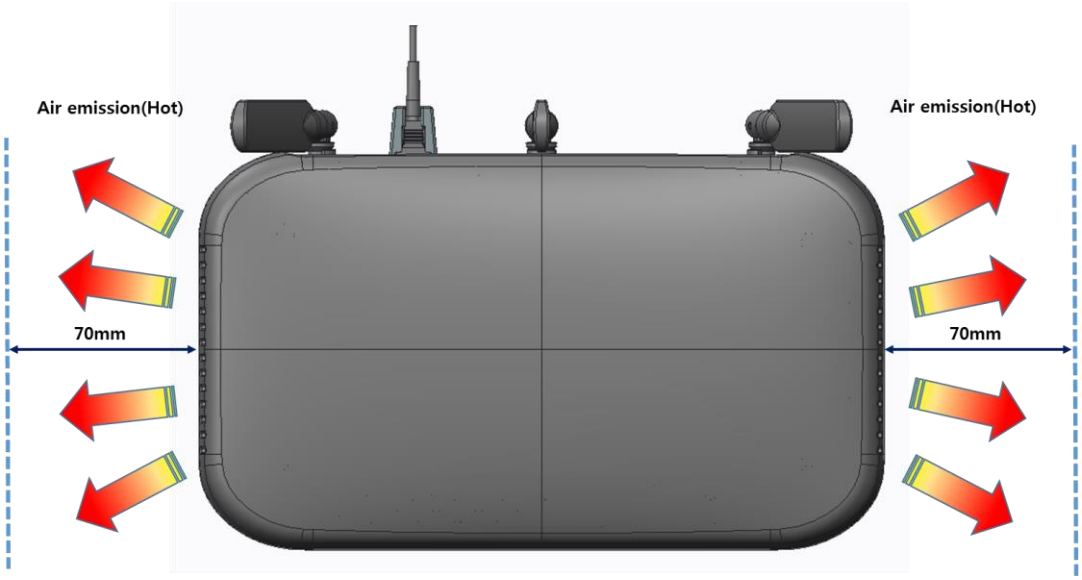
Quick Install Guide

Before Installation

Notice Place the C1004W ONU on the solid surface to get a cool air inflow for air circulation.



Notice Do not place any objects within 70mm of the both side of C1004W.



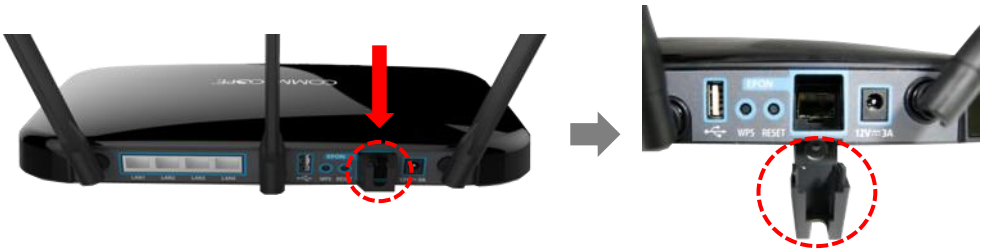
Installation

Warning Invisible laser radiation may be emitted from disconnected fibers or connectors. Do not stare into beams or view directly with optical instruments.

Notice. Be cautious when you connect hinged cover not to break pivot point and instruct end users not to touch it.

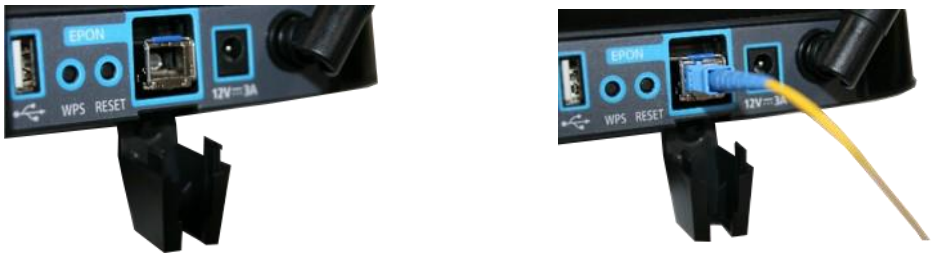
The sequence of installation is described from step 1 to 9 as below:

Step 1: Push gently down the hinged cover to connect the 10G SFP+ optic module.

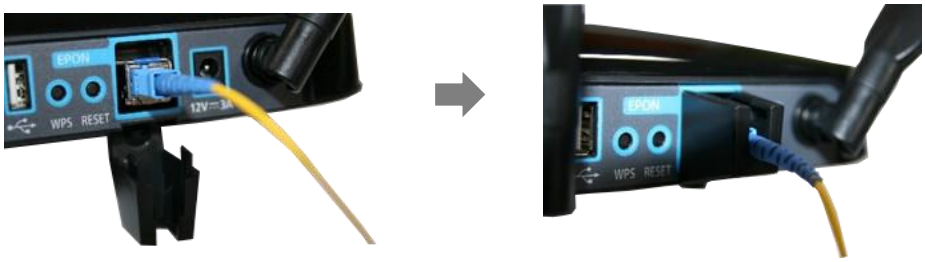


Step 2: Slide the 10G SFP+ optic module into the socket on the ONU.

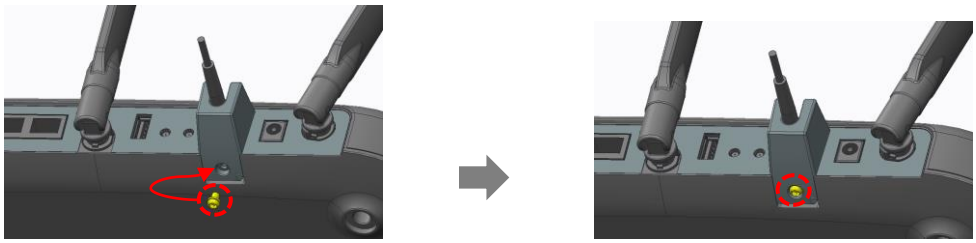
Step 3: Connect the SC/APC connector on one end of a single-mode optical fiber into the optical terminal of the optical outlet (it could be a splitter or PIM card of an OLT) and the other end into the PON port of C1004W by pushing it until a click sound is heard.



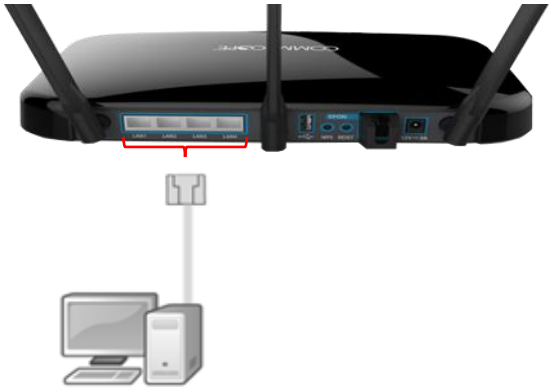
Step 4: Lift the hinged cover back into its position with care.



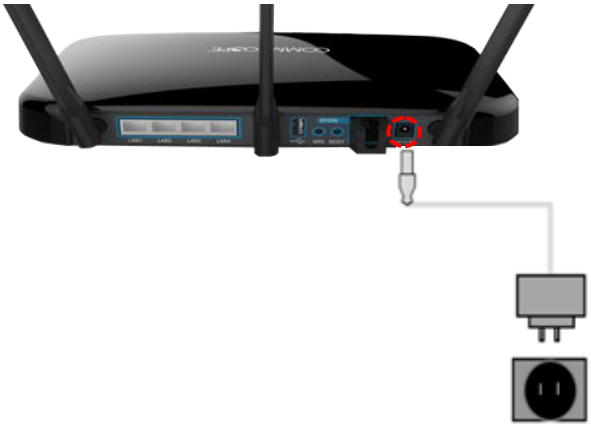
Step 5: Fix the hinged cover by fastening the enclosed screw at the screw hole at the bottom using 6-lobe star wrench (a special tool which is not enclosed).



Step 6: Connect any LAN port of C1004W and a PC with an Ethernet cable which has RJ-45 plug head. Up to 4 PCs or its equivalent (e.g. IP phone) can be accommodated.



Step 7: Connect the rated power adaptor (12VDC 3A) to the power jack in the unit.



Step 8: Raise the antennas positioning for the best WiFi performance.

Step 9: Now you are ready to use.

LED Indicator

The following steps can be referenced to see if the unit is in normal status when all the necessary connection for the unit is completed.

- Make sure that the POWER LED is ON.

- Make sure that the PON LED is ON in several seconds or minutes. If PON LED is red, the optical signal is very low, so please contact your service provider.

- If everything is installed properly, the user can see the DATA LED blink while Internet data is being sent or received.

- If you set the wireless configuration properly, the user can see the applicable wireless device WLAN LED blink while data is sent or received.

Web GUI configuration setting

Default configuration setting

When the installation of C1004W hardware is finished it is operable to get on internet access via wireline and wireless ports.

The uplink interface of 10G EPON is configured to operate as NAT mode as its default. Therefore once the uplink interface is properly connected all the LAN ports and wireless interface work out. In this case each LAN port will be assigned private address for the internal routing within C1004W.

If any changed mode of operation is required other than default configuration, web GUI configuration work will be needed. The actual modification will vary according to operator's requirement or service policy. An example of most frequently used configuration setting regarding VLAN assignment is presented later in this section.

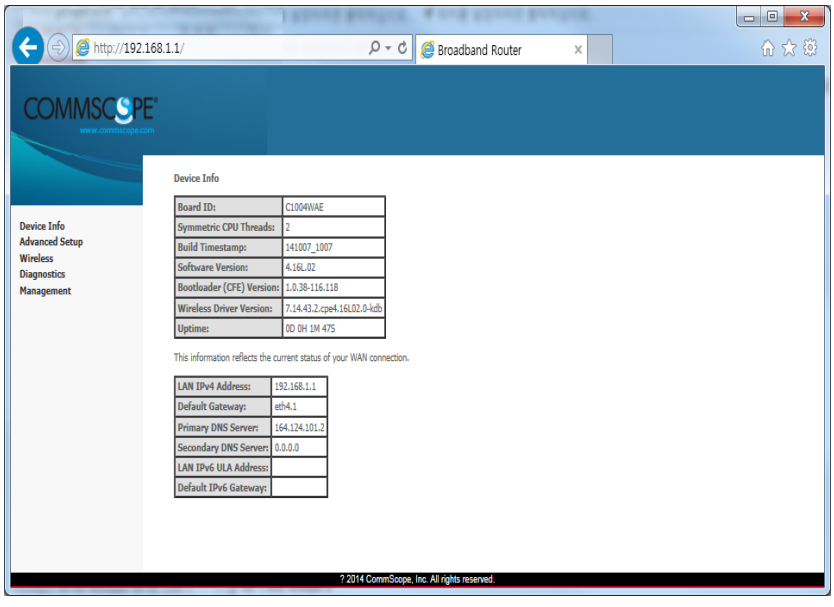
Web Login

In order to configure C1004W via Web GUI page, connect your PC to any port of C1004W service ports with the enclosed RJ-45/UTP cable. After connecting PC on a LAN port, type http://192.168.1.1 in the URL window of your Web Browser.

C1004W provides 3 accounts as follows:

Account	Id / password	Usage
Administrator Login	admin / admin	For both changing and viewing the setting
Operator Login	support/support	Used when accessing the unit remotely
User Login	user / user	For viewing only

When you connect the unit via Web Browser, the following screen will show up as its starting page.

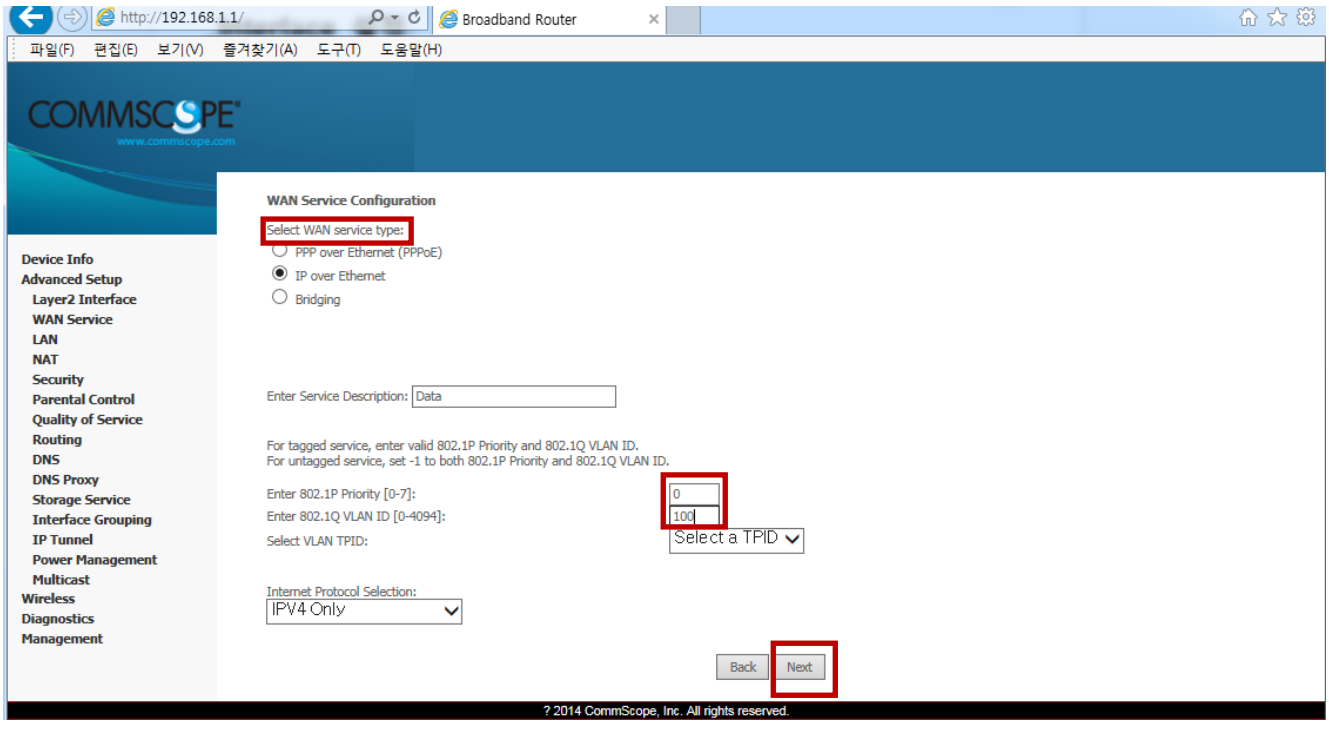


	Note	If it does not work, after pushing RESET button at the rear of system, then wait one or two minutes and try it again.

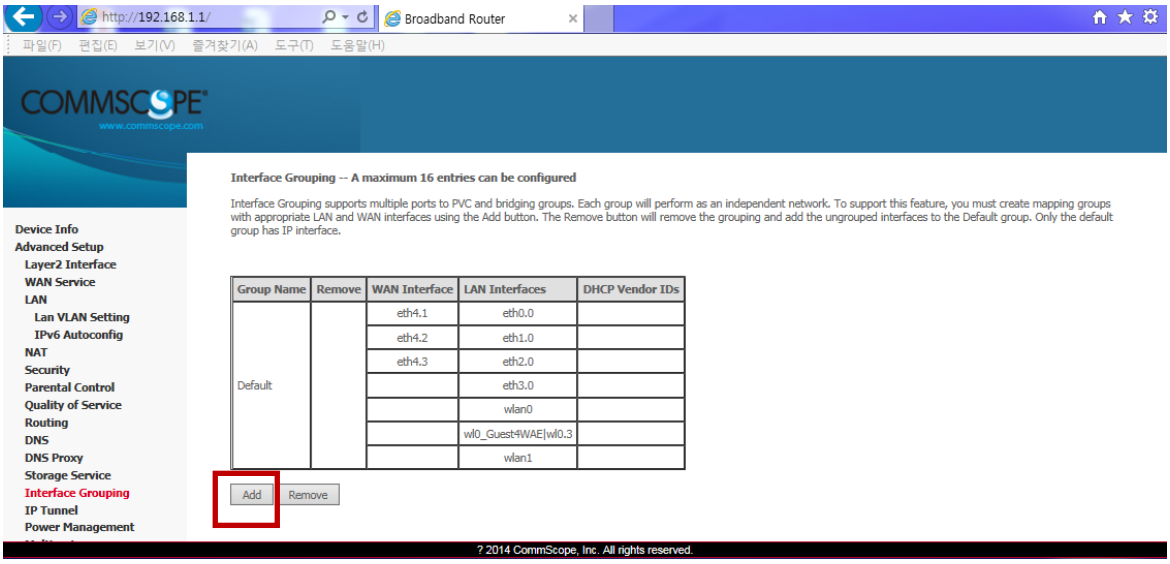
VLAN assignment

Go to the menu item in the left side of starting window.

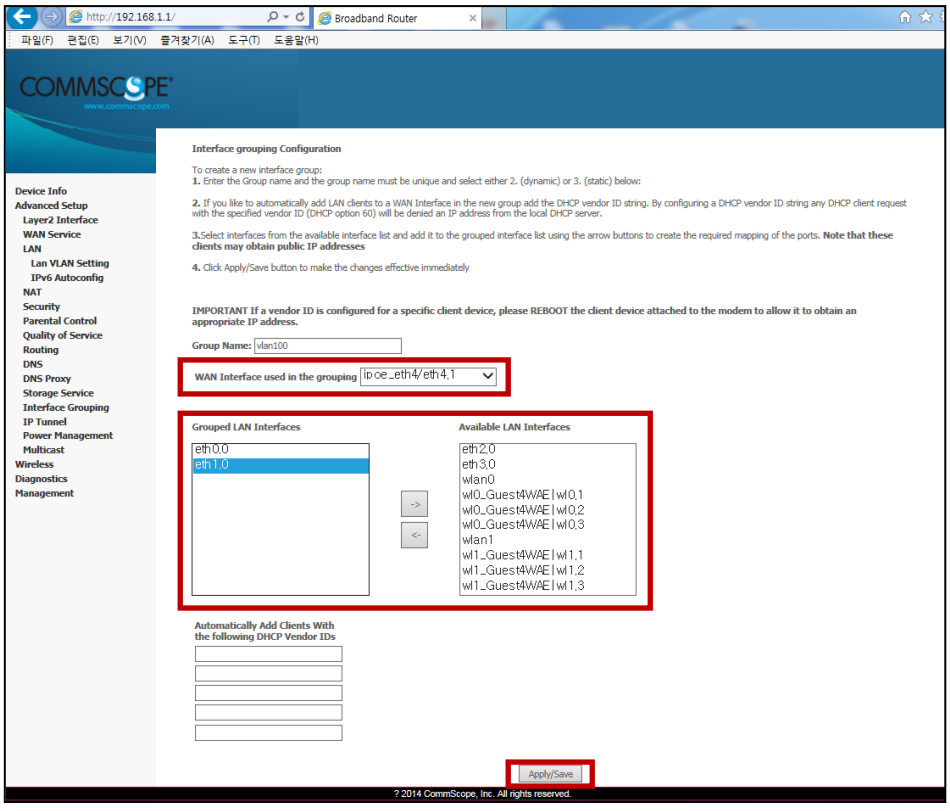
- Select ‘Advance setup’ -> ‘Wan Service’
- Configure interface and Vlan setup
- With respect to ‘WAN Service Configuration’
  - IP over Ethernet is for NAT mode
  - Bridging is for Bridge mode
- Assign the COS value and VLAN ID to be used



- Select ‘Advance setup’ -> ‘Interface Grouping’
- Click ‘Add’ button.

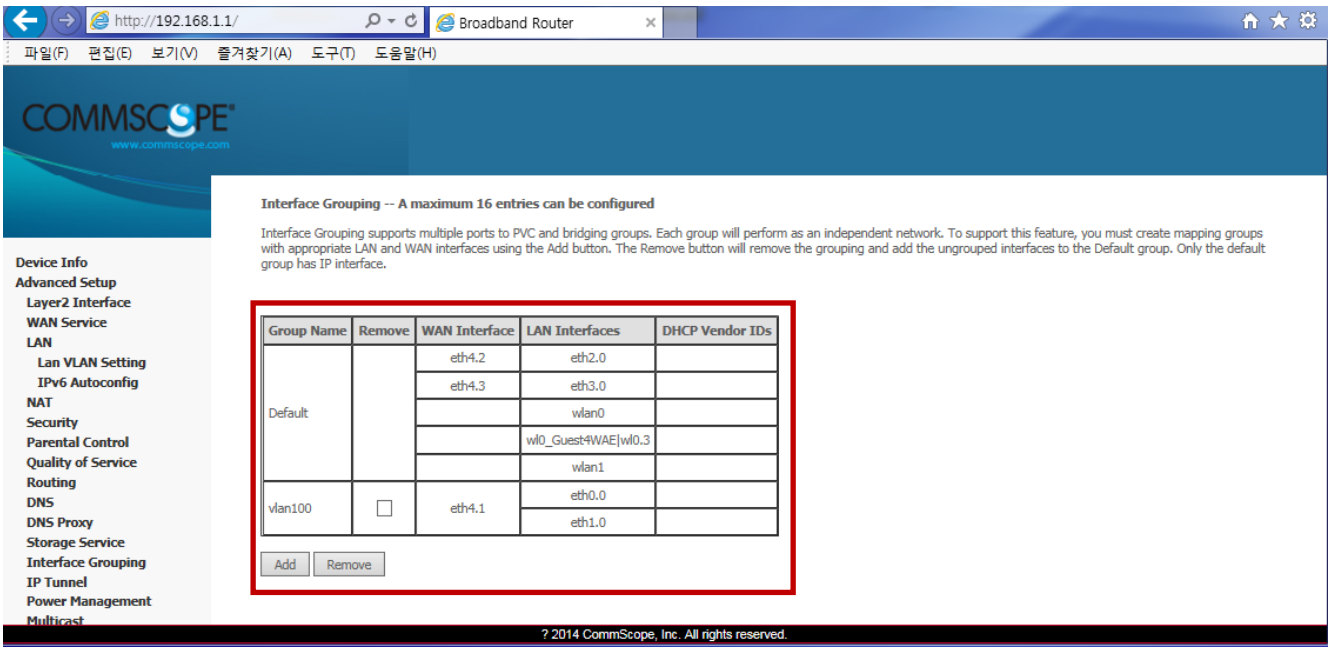


- Select an entry among ‘WAN Inteface used in the grouping’ menu.
- Move as many interfaces as wish from the right box to left. Then the moved interface will be assigned to the newly created VLAN Id.



In the example two physical interfaces of port 1 and port 2 are moved to ‘Group LAN Interface’.

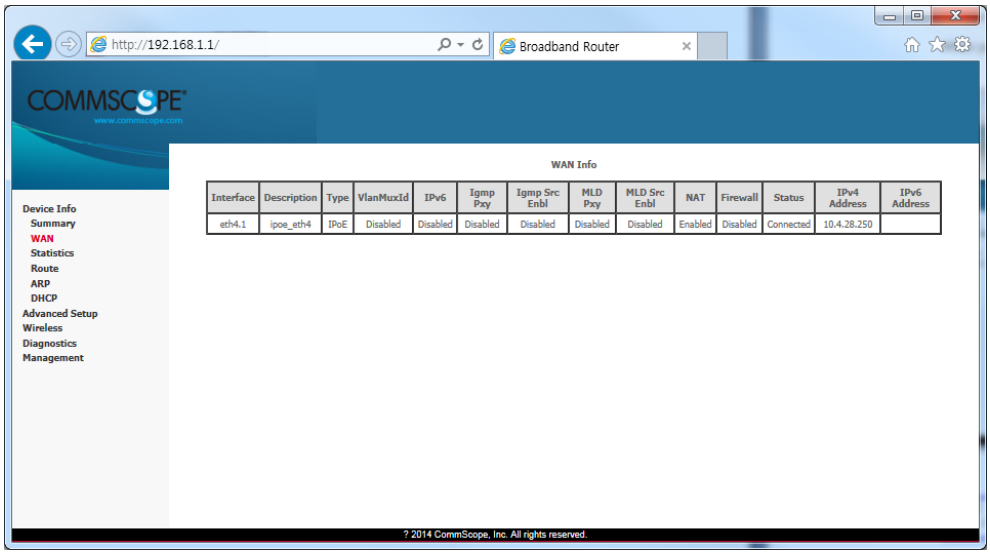
- Check out to see if VLAN 100 is associated with port 1 and port 2 in the table shown below. (you may again select ‘Advance setup’ -> ‘Interface Grouping’)



Device Info

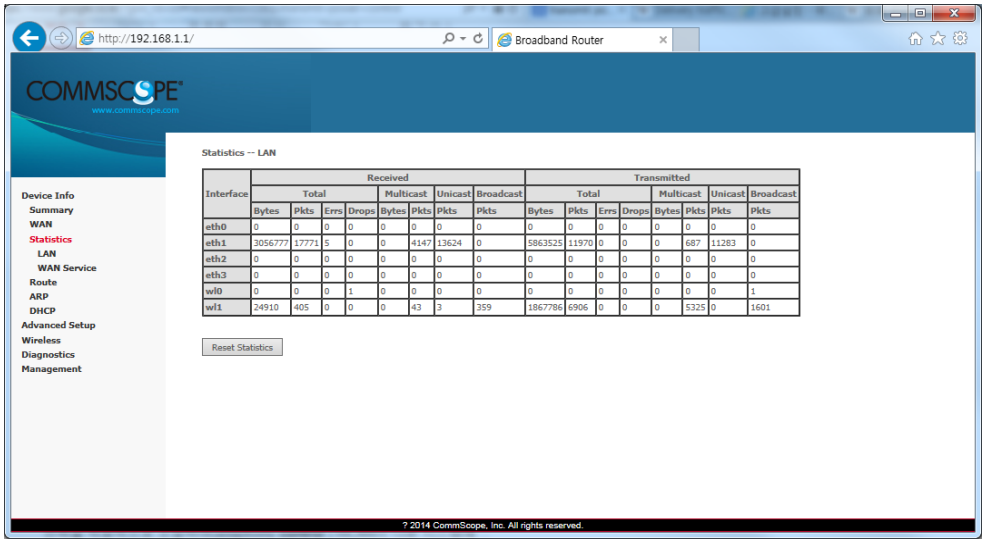
Device Info shows the basic information about ONU. The information to be able to search is as follows:

- WAN status and IP Information



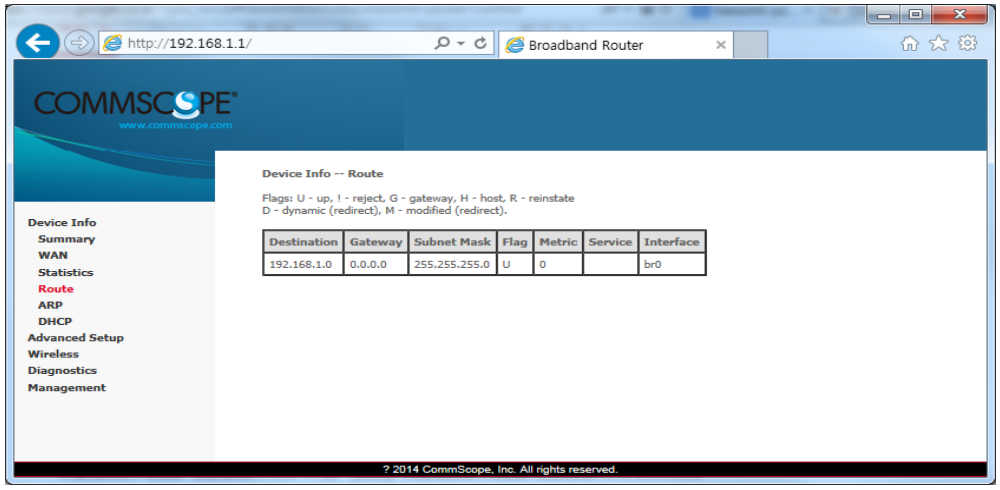
Interface	Description	Type	VlanMuxId	IPv6	Igmp Pxy	Igmp Src Enbl	MLD Pxy	MLD Src Enbl	NAT	Firewall	Status	IPv4 Address	IPv6 Address
eth4.1	ipoe_eth4	IPoE	Disabled	Disabled	Disabled	Disabled	Disabled	Disabled	Enabled	Disabled	Connected	10.4.28.250	

- Statistics information about WAN / LAN / WLAN

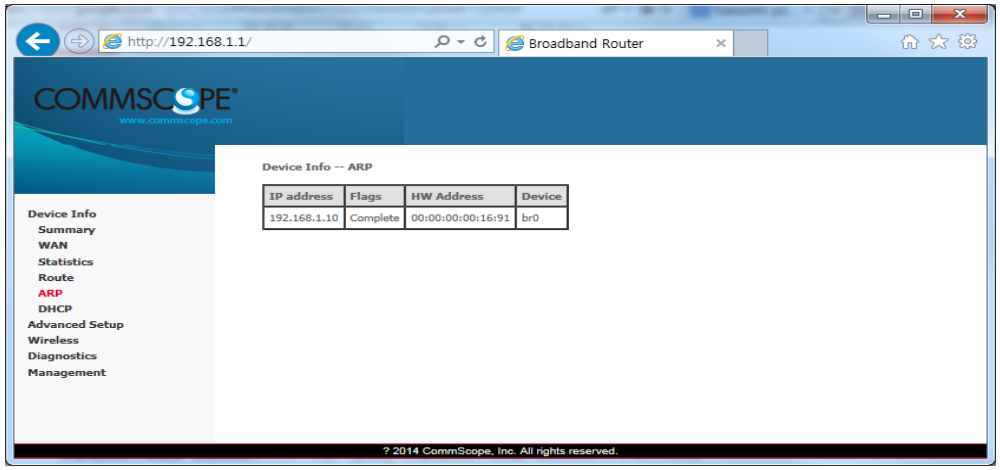


Interface	Received								Transmitted							
	Total				Multicast		Unicast	Broadcast	Total				Multicast		Unicast	Broadcast
	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts	Bytes	Pkts	Errs	Drops	Bytes	Pkts	Pkts	Pkts
eth0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eth1	3056777	17771	5	0	0	4147	13624	0	5863525	11970	0	0	0	687	11283	0
eth2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
eth3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
wl0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
wl1	24910	405	0	0	0	43	3	359	1867786	6906	0	0	0	5325	0	1601

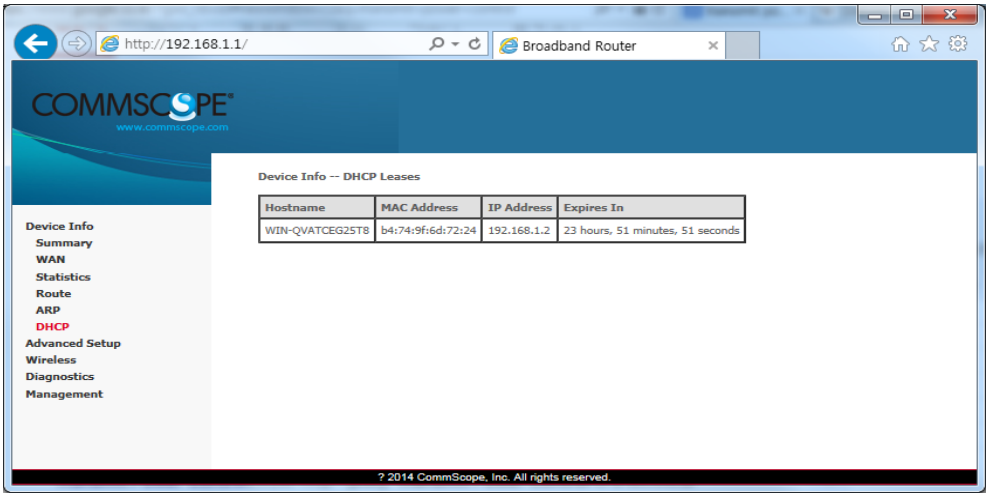
- Route Information



- ARP Information



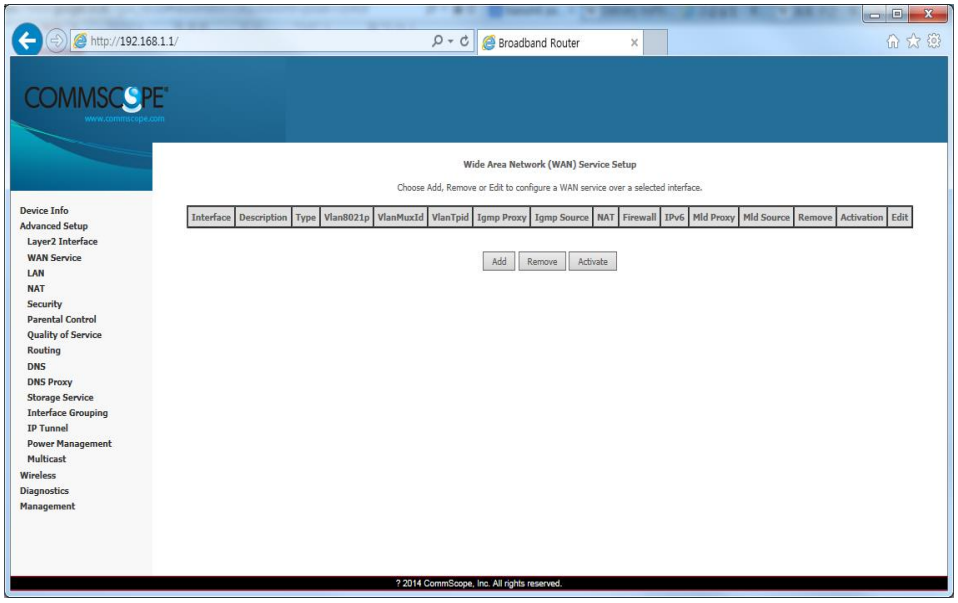
- DHCP Information assigned with LAN / WLAN

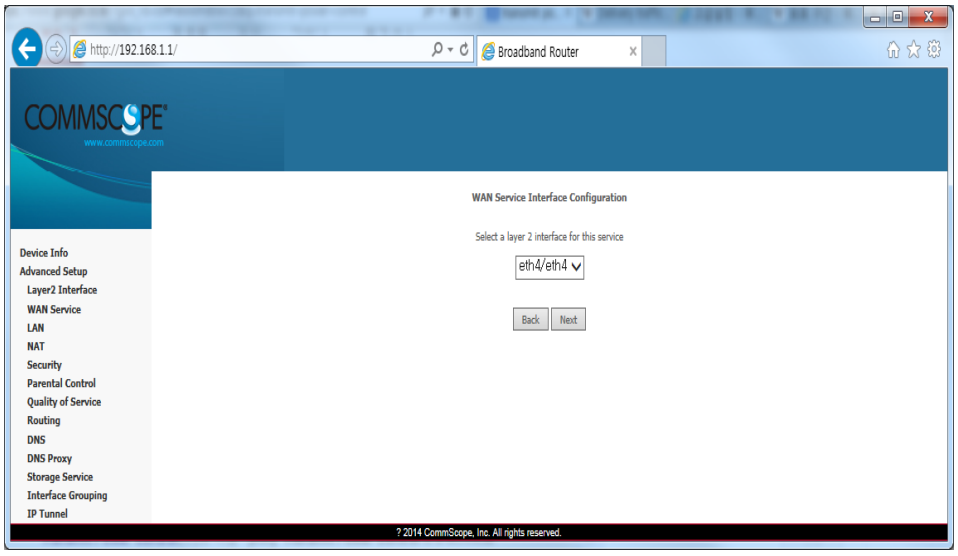


Advanced Setup / WAN Service

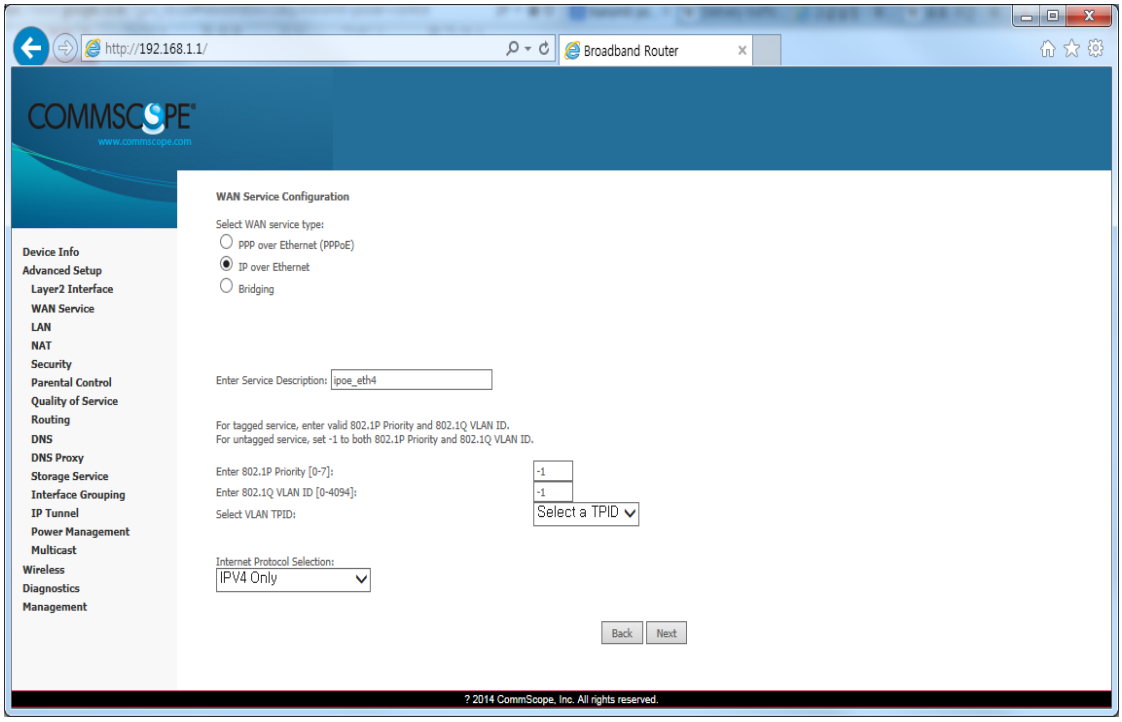
You can create the Interface for various WAN service based on the assigned WAN Physical Port.

To create WAN Service Interface, click [Add] button on [WAN Service Setup Display].





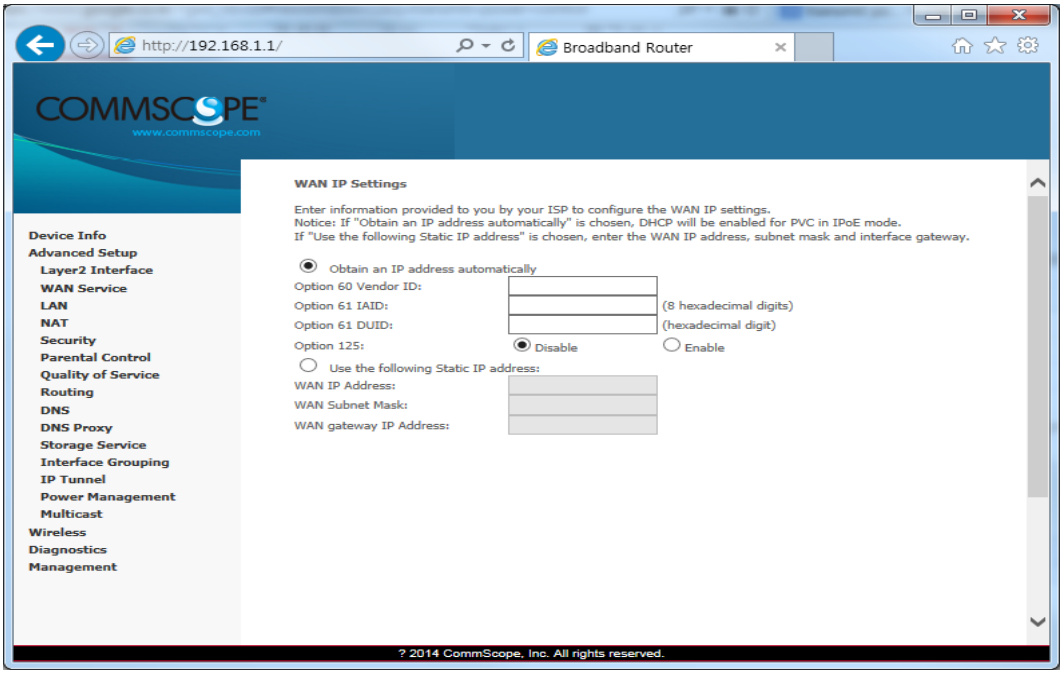
If you click [Next] button, you can assign VLAN ID about 802.1Q and a priority about WAN service type and 802.1P.



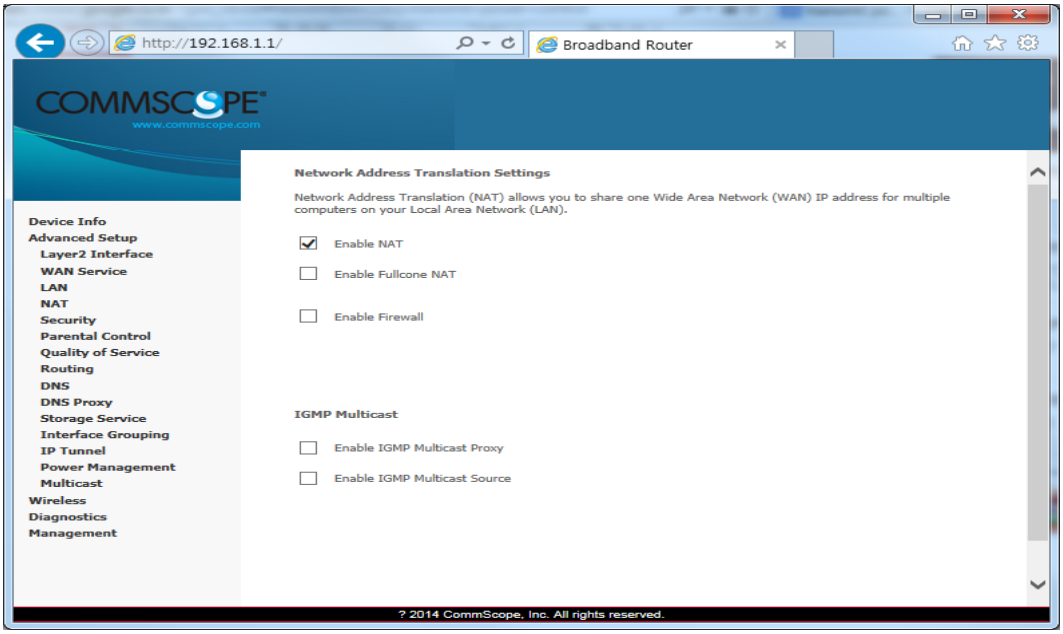
	Note	In case of assigning as Untagged Service from WAN Service Interface, you must set it as '-1'.

If you click [Next] button, you can set IP about WAN Service Interface. When the system needs to obtain an IP address automatically from DHCP server connected with WAN network, select [Obtain an IP address automatically] radio button.

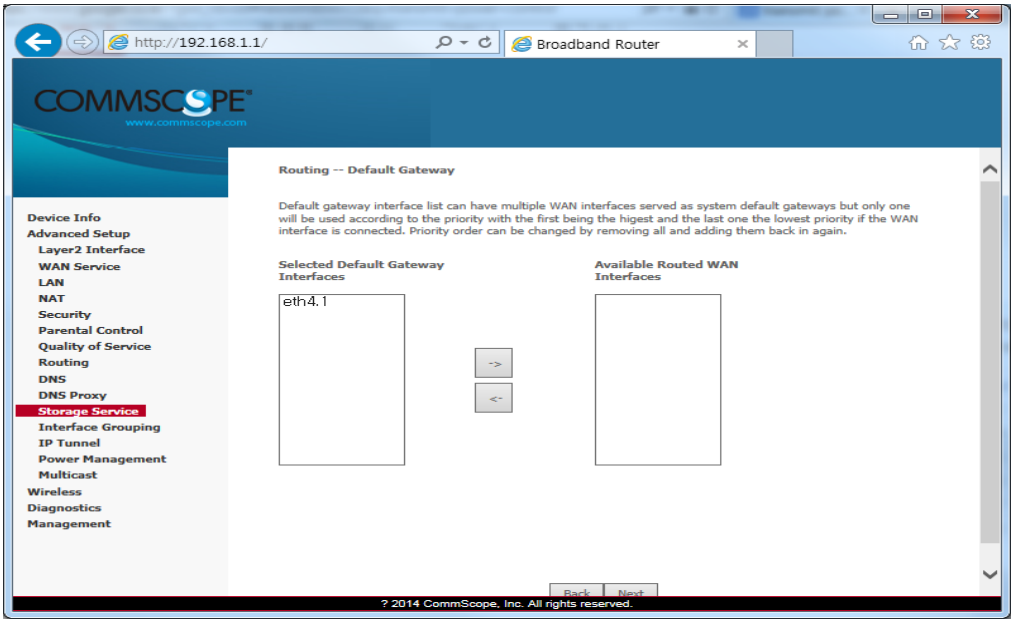
When the system uses the static IP address on WAN Service Interface, select [Use the following Static IP address]. Then set Static IP Address, Subnet Mask and Gateway IP Address.



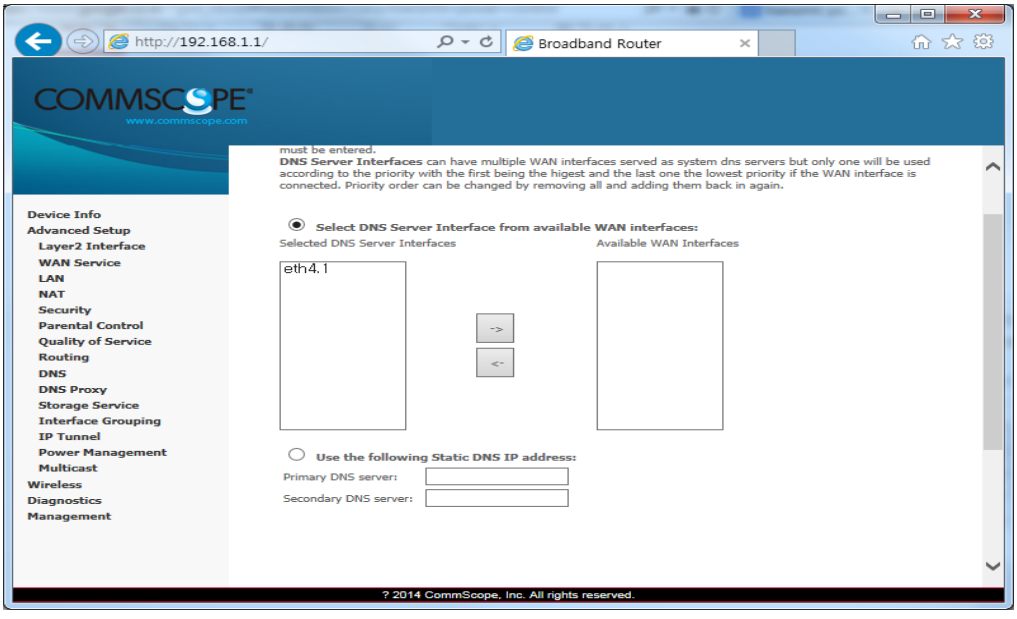
If you click [Next] button, you can enable NAT and Multicast function on the WAN service Interface.



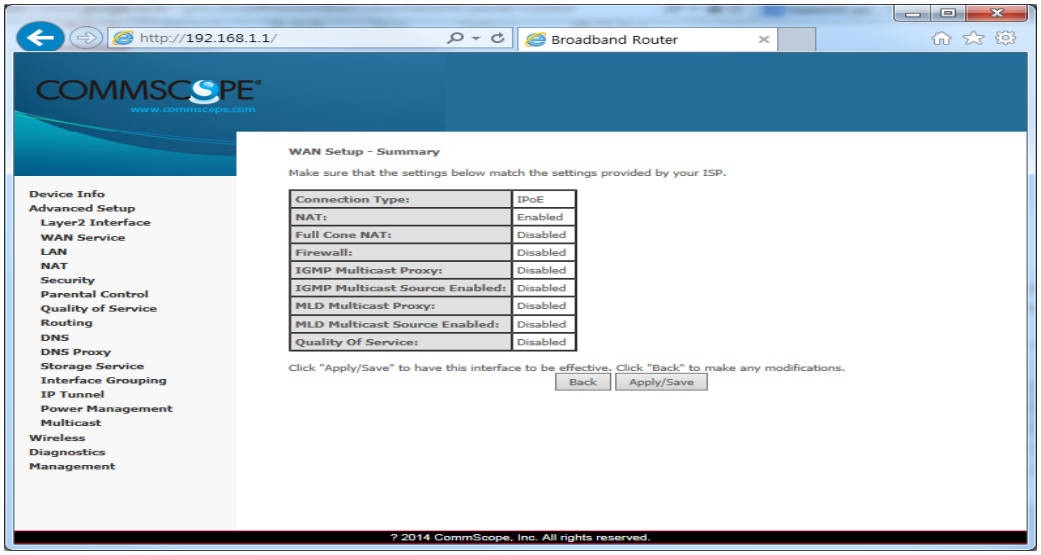
If you click [Next] button, you can assign Default Gateway about WAN Service Interface.



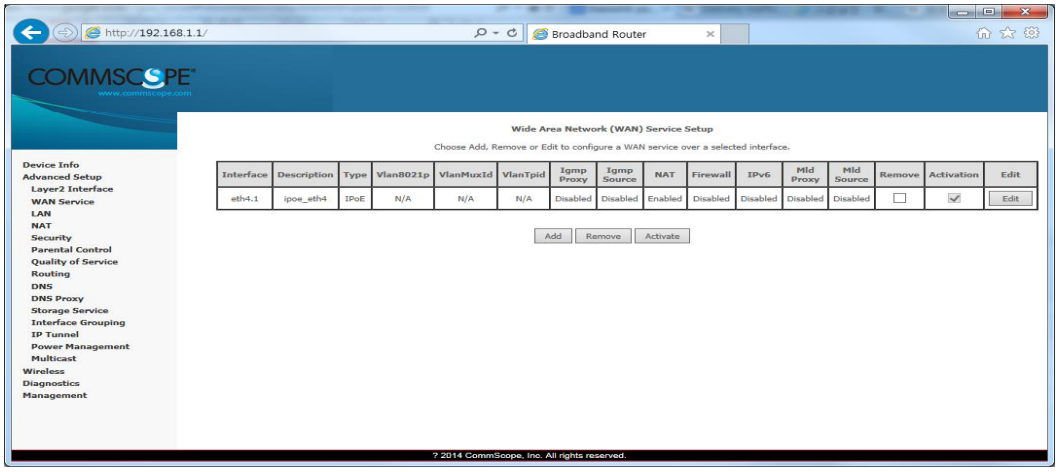
If you click [Next] button, you can set DNS Server about WAN Service Interface.



When the above procedure is done, it shows the information about WAN Service to be applied finally.



When you click [Apply/Save] button, the information of the set WAN Service Interface is listed and it is done about WAN Service Interface.



	Note	If you change 802.1P, 802.1Q on the created WAN Service Interface, you must register again after deleting WAN Service.

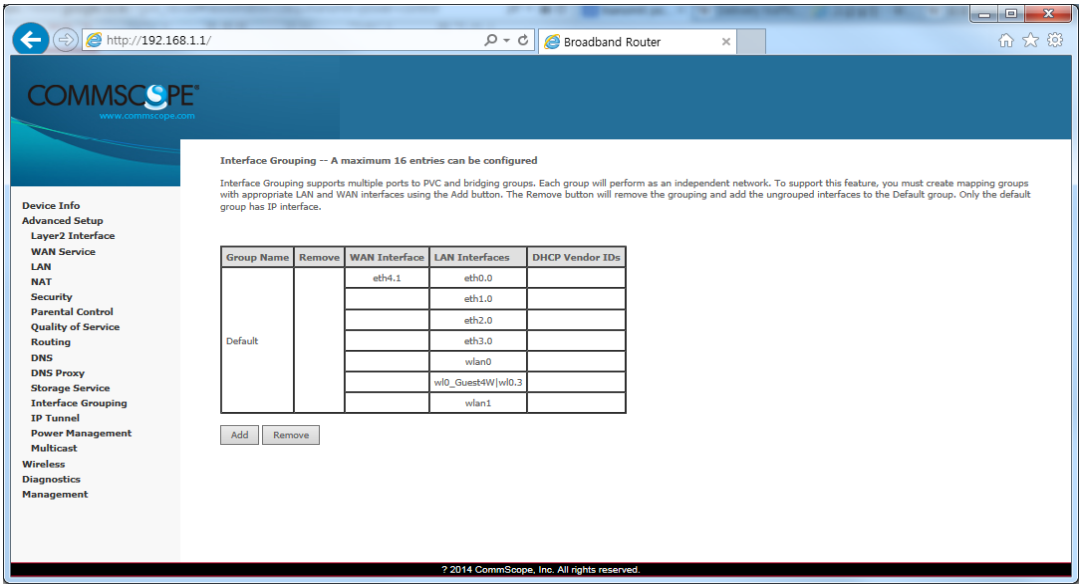
	Note	In case that you assign 802.1Q VLAN-ID individually on the several WAN Service and do grouping LAN Interfaces, refer to Interface Grouping setting on Advanced Setup Section.

Advanced Setup / Interface Grouping

By creating several groups, you can manage several LAN Interfaces with Interface grouping provided from Advanced setup.

By default, one default group includes all LAN Interfaces.

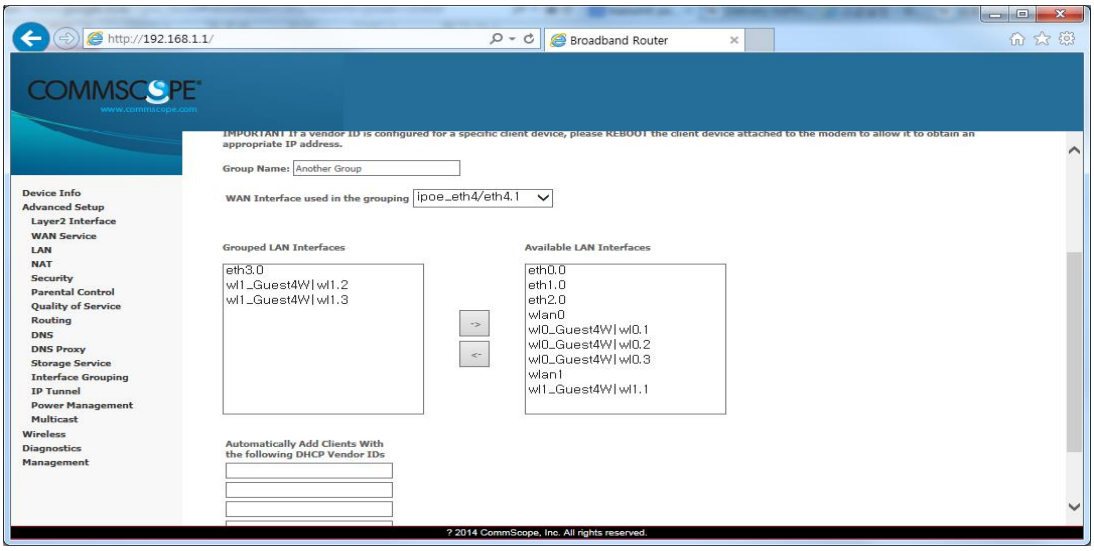
To create Interface Group, click [Add] button on [Interface Group Display]



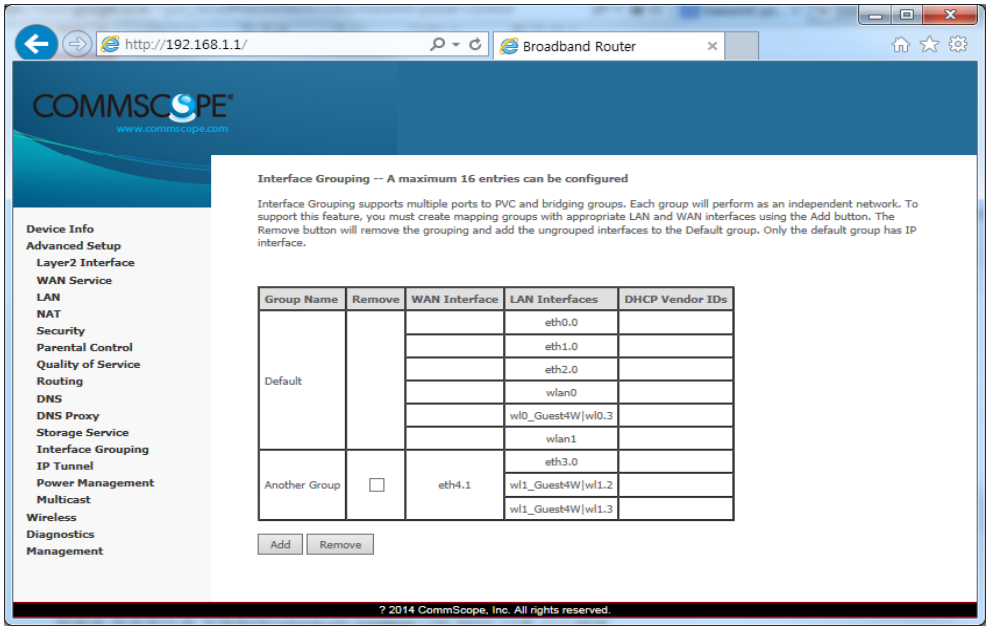
Set Group Name with easy name to acknowledge. To set WAN Interface for using to create Group, select list box. After selecting WAN Interface, select LAN Interface for including to group to create.

Select LAN Interface to move on the [Available LAN Interfaces] BOX.

If you click arrow button, it moves to the [Grouped LAN Interfaces] BOX.

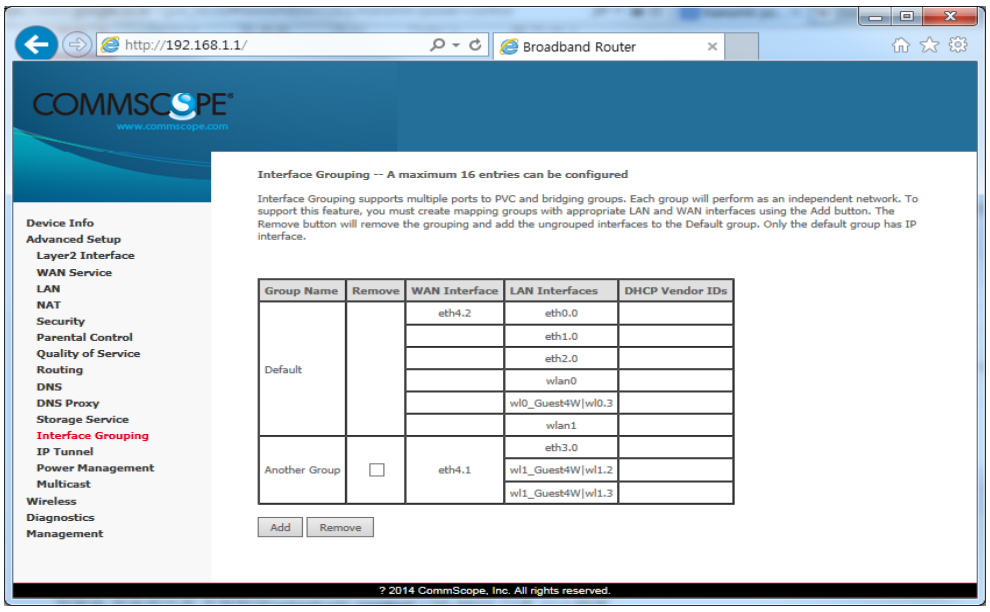


After the creating Group by clicking [Apply/Save] button, the Group is created like following screen.



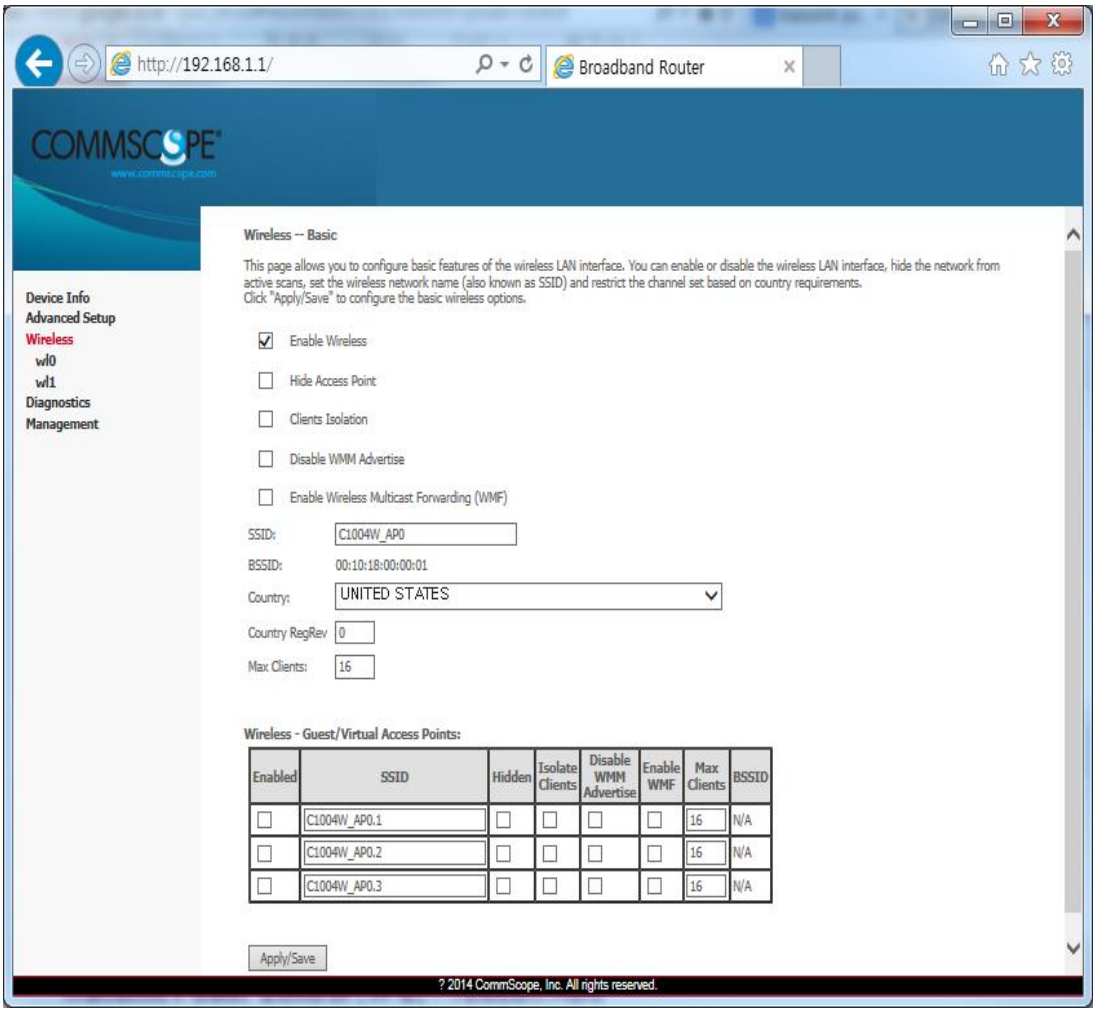
	Note	To process incoming traffic after applying VLAN ID per each Group, one WAN interface per Group system is applied. Thus, to set like the following screen, you must add WAN interface before creating Group.

	Note	To know the way of adding WAN Interface, refer to [Advanced Setup / WAN Service].



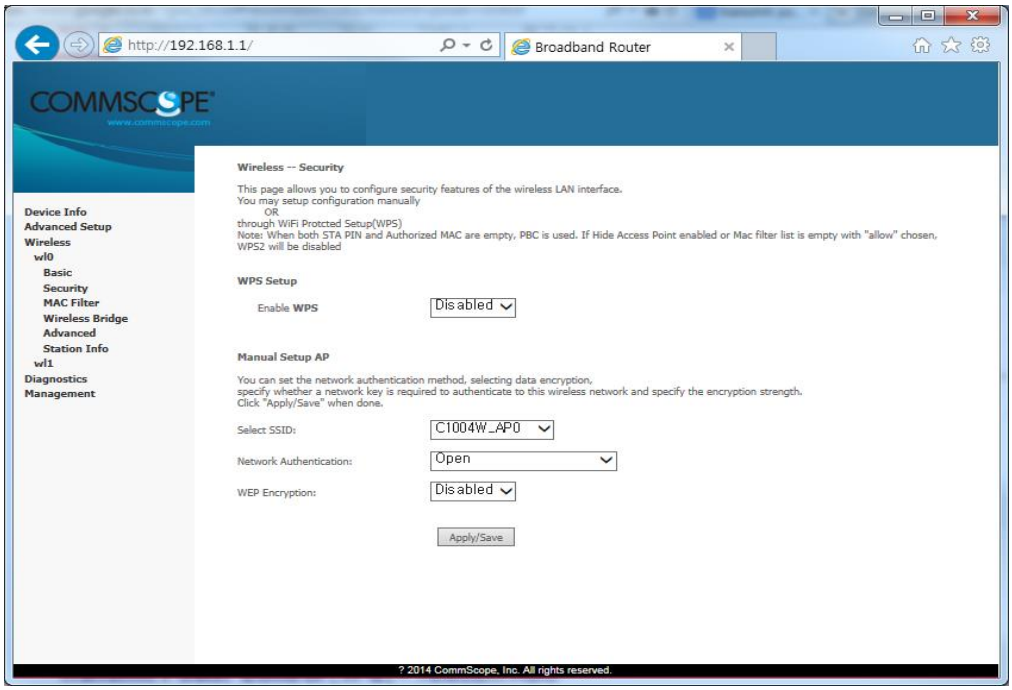
Wireless / Basic

You can set the basic Wireless configuration. It provides 4 Wireless interfaces and you can set each WLAN activation and Scanning activation from network list. It is possible to set SSID and a nation for wireless channel.



Wireless / Security

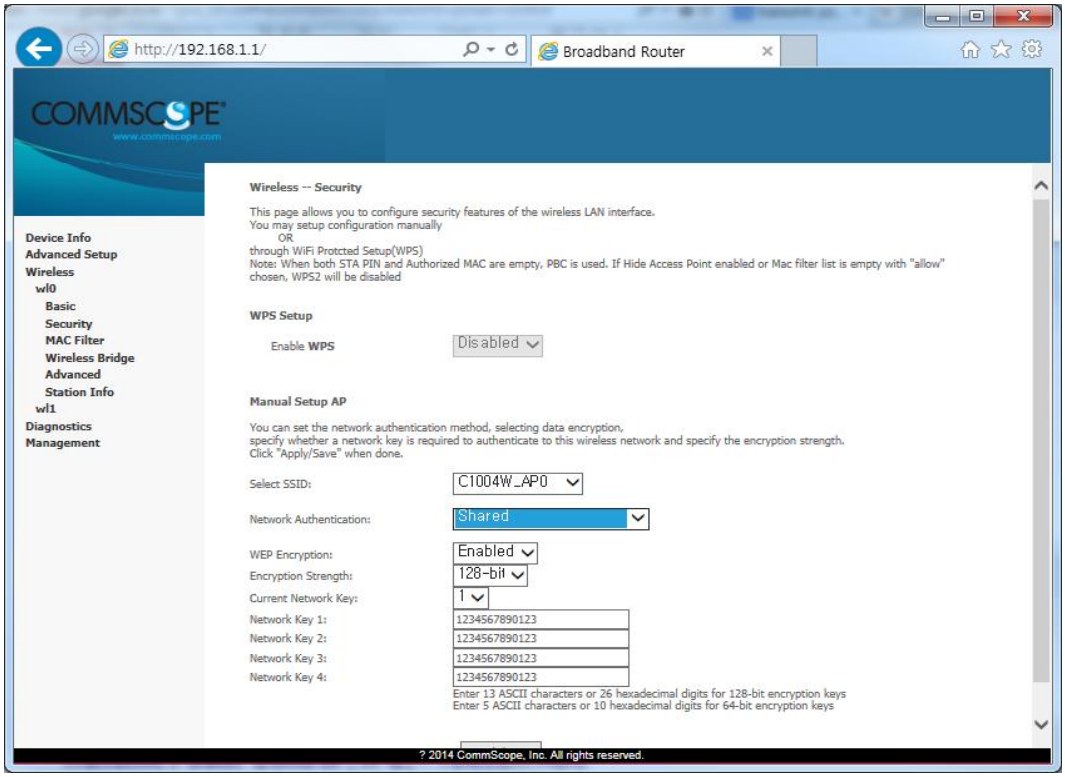
You can set the security of wiress. It is possible to apply the specific network authentication per each SSID. It is also possible to set the key encryption for authentication or not.



Network authentication Way

Authentication way	Description
Open	No Encryption.
Shared	WEP 64Bit : 5 or 10 numbers security key 128Bit : 13 or 26 security key
802.1X	Uses Radius Server / WEP key
WPA2	Advanced WPA
WPA2-PSK	WPA / WAPI passphrase Key
Mixed WPA2 /WPA	Mixed WPA and WPA2
Mixed WPA2 / WPA-PSK	Mixed WPA-PSK and WPA2-PSK

To apply “Shared” that is the most basic Network Authentication way, Select “Shared” on the Authentication Select Box.

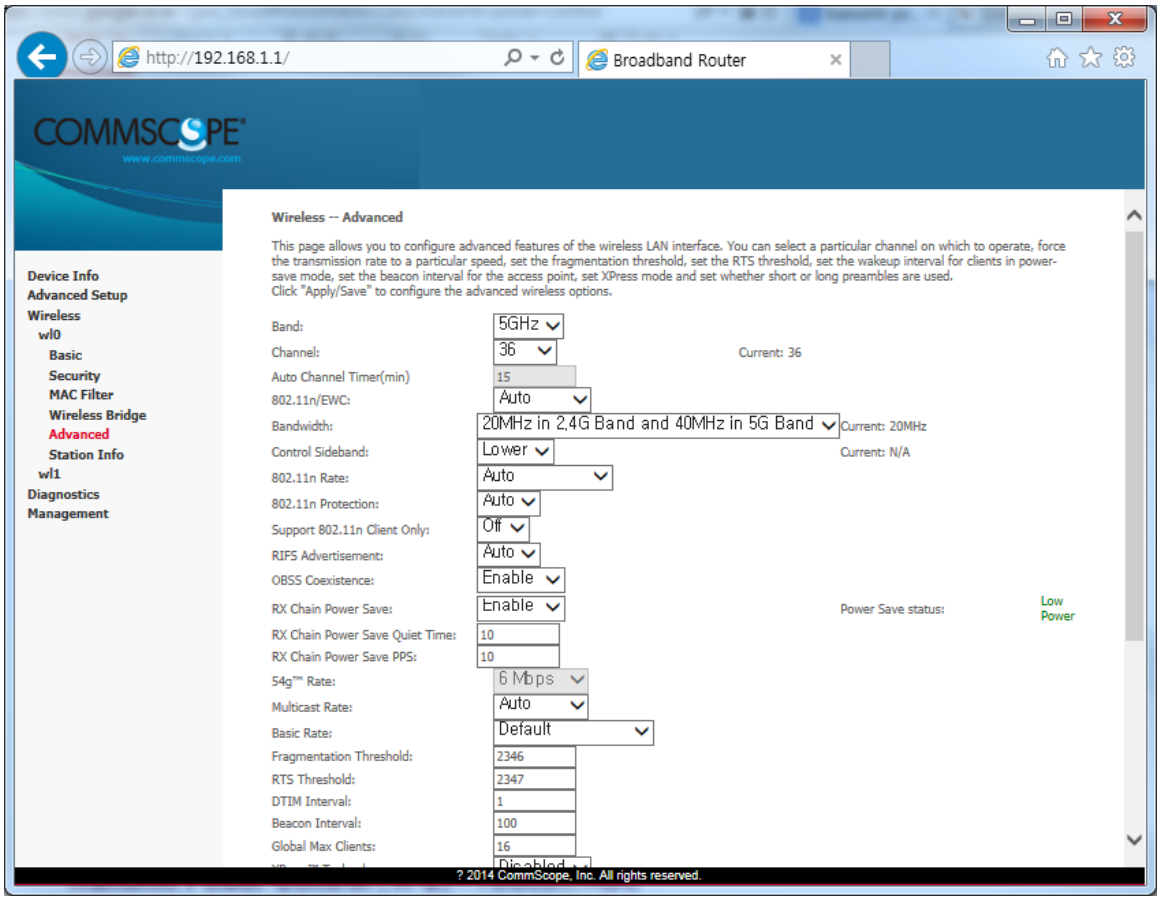


	Note	When you select each Network Authentication way, the screen shows the different setting options.

	Note	You can select Current Network Key among 1~4. We recommend changing a new Network key value instead of default value.

Wireless / Advanced

It is possible to set the advanced setting about Wireless LAN Interface. You can set the specific channel to want to run. You can set the transmission speed according to bandwidth and Beacon interval for AP.



Note You can use 2.4GHZ Band in wl1, 5GHZ Band in wl0.

Troubleshooting

Possible troubles and its quick remedy:

Symptom 1: “Can not access to the Internet” -

Step 1 Make sure that the ONU is turned on. Once you turn on the power, the POWER LED on the front panel of C1004W should be lit. If the POWER LED is not lit, please check if the power cable is connected to the power inlet of ONU properly. If the problem persists, please call Service Provider.

Step 2 Make sure that the optical line is connected properly. Once the optic fiber is connected, the PON LED on the front panel of C1004W should be lit on within few seconds. If the PON LED blinks, call Service Provider to check the optical line connection.

Step 3 Make sure that the LAN cable is connected properly. Once the LAN cable is connected and user PC is turned on, LAN LED should be lit on. If the LED is not lit, check the cable connection.

Step 4 Make sure that network setting of your PC is correct. Select “set to ‘Obtain IP address automatically’.

Symptom 2: “All the cables are connected, but still can not obtain IP address”

Step 1 Look for the Network Neighborhood or My Network Places icon in your PC. If it is not there, try your Start Menu.

Step 2 Right-click the Network Neighborhood/My Network Places icon. A drop-down menu will appear.

Step 3 Choose the "Properties" option, which is generally found at the bottom of the menu.

Step 4 Look for an icon named "Local Area Connection". The icon looks like a pair of computer connected by a link. Double-click this icon.

Step 5 Click the "General" tab, if it is not already selected. You will see a list of protocols to choose.

Step 6 Scroll down and choose Internet Protocol (TCP/IP), and then click the button that is labeled "Properties".

Step 7 Again, click the "General" tab, it is not already selected. You will see two choices:
1) "Obtain an IP address Automatically"
2) "Use the following IP address..."

Step 8 Choose option “1)”

Step 9 Click OK

Symptom 3: "WiFi access to the unit is not available"

Step 1 Make sure DPoE provisioning has been finished normally by checking out PON LED.

Step 2 Power cycle the unit to reboot.

Symptom 4: "DPoE Provisioning for the unit is not finished properly, i.e. the PON LED on C1004W does not light up or blink"

Step 1 Connect to the console port or management port of the associated OLT.

Step 2 Execute the following CLIs to diagnosis the status of the C1004W.

CLI	Target action
show cable modem	To see if the unit is on-line
show cable modem mac_address vervose	To retrieve the DDMI information which proves its integrity
show cable modem cpe	To check out CPE information (e.g. IP address, MAC address)
show epon onu	To see if the unit is on-line
show 10gpon olt ddmi slot/port mac_address	To check out the strength of the RX signal from C1004W
show slot	To check out the active status of PIM slot
show epon olt	To get the MAC address of 10G PIM card
show cable firmware	To get the cable firmware information (Xenu)
show logging cable	To see the DML log to find the reason why provisioning hasn't worked out right
show bundle	To see the DHCP server configuration whether it works out properly
tcpdump interface vlan4001	To look into the packets that flows through the default bundle

Step 3 If the diagnosis result of step 2 says that C1004W has got any fault at its uplink interface(i.e. Xenu), then reboot the uplink interface part of the unit.

Use the CLI of 'clear cable modem all reset' to reboot the unit.

Specification

Item	Description	
Standard	IEEE 802.1q	
System Architecture	Type	Desktop
	Size (mm)	288.50(W) x 186.60 (D) x 150.00(H) (incl. antenna)
	Weight	820g
Power	Input: 100 ~ 220VAC, 50~60Hz	
	Output: 12VDC, 3A (The input terminal that a power adaptor is connected to)	
	Consumption: Max 16.9W	
Available Interface	PON interface	10/10, 10/1, 2/1, 1/1 Gbps supported
	User interface	Four 10/100/1000base-Tx, MDI/MDIX Auto-Negotiation
	Wi-Fi Interface	802.11b/g/n/ac compliant
Environmental Condition	Operating Temperature/humidity: 0℃ ~ 50℃	
	Storage Temperature/humidity: -20℃ ~ 60℃	
	In compliance with EMI/EMC Class	
Function and Performance	EPON	IEEE802.3ah MPCP, OAM compliant
		802.1Q VLAN
		Per LLID Filtering/Classification
		Supports up to four Logical Link IDs (LLID)
		AES-128 Downstream decryption
		Dying Gasp
		Automatic Plug and Play function for WAN PON Port (Discovery and Authorization)
	L2 Features	IEEE802.1Q VLAN(Tagged, untagged by Port) for WAN Port
		Maxumum 16 active VLAN
		VLAN ID range of 1~4094
		Support up to 64 MAC Address
	L3 Features	DHCP Client/Server
		In NAT mode, IP will be assigned from the IP Pool of the device, and in Bridge mode, the IP will be assigned from the DHCP server in the network
		Support DNS/DNS Proxy
	Multicasting	IGMP v1/v2/v3
		IGMP proxy/snooping for IPTV service
		IGMP Immediate Leave on/off
		32 Multicast Group entry
		Multicast throughput 1Gbps
	NAT/NAPT	Selectable between NAT mode and bridge mode
		Dynamic/static private IP in NAT mode
		Port Forwarding and DMZ Host function
		Maximum 8K bi-directional concurrent sessions(full-wire-speed)
	QoS	Rate limiting (±10%)
		QoS for both upstream and downstream
		Rate limiting
	Security & filtering	Broadcast storm control
		MAC filtering
		IP filtering
	WiFi	IEEE 802.11b/g/n/ac
		Automatic Fallback

		Manual or automatic selectable channel
		Mixed use of 802.11b, 802.11g, 802.11n, 802.11ac
		Support 11n/11ac dual current mode
		Encryption (Keys such as Hex, ASCII, special character should be supported)
		64/128bit Static WEP Key
		WPA/WPA2/WPA-PSK/ WPA2-PSK
		4 or more Virtual AP (Multi SSID), and each SSID supports different encryption
		SSID should support alphabet, numeric, special character
		Hidden SSID
		Support WMM(Wireless LAN QoS function: IEEE 802.11e)
		IEEE 802.1x
		EAP MD5/EAP TTLS/PEAP
		RADIUS Client function
		Support TR-069
		WDS
		WMF
		Client isolation
		Support WPS with hardware PUSH button and 'configured' mode.
	O&M	System or module LED.
		Memory structure that allows to save or modify Configuration File
		Memory should keep the contents of the memory even when power supply is stopped.
		Local and remote Firmware Upgrade (The existing Image should be kept when upgrade fails).
		Normal session for system management even when CPU overload
		Remote Management
		Remote access through Telnet(RFC 854, 855)
		CPE Management Server
		Device Reset
		Setting and changing Config
		Firmware download only through Web Server by TR069
		Time sync through NTP Server
		Device status and performance management
		Support storage function and SAMBA by USB
	IPv6	Support Dualstack
		Support DHCP Server and IPv6 addressing type: SLAAC (Stateless Address)
		Using DHCP Server and IPv6 addressing type: Stateful
		Support ICMPv6
		Support IPv6 Filtering
System Operation and Maintenance	Link Measurement and diagnostic	Support OAM Remote Loop back test.
		OLT detects EPON Signal Strength to check the status of ONU signal received/transmitted based on
Physical Characteristics	Optical characteristics	Transmission distance: 10Km or 20Km(Optional)
		Transmission quality: BER 10-10 or lower
		Transmission level : -1~4dBm
	Dielectric resistance	100Mohm or higher (based on DC 500V)

Technical Standard and Protocol	IEEE Std 802.3™-2002 Carrier sense multiple access with collision detection (CSMA/CD) access method and physical layer specifications
	IEEE Std 802.11n: Wireless Local Area Networks
	IEEE Std 802.1D, 1998 Edition Media Access Control (MAC) Bridges
	IEEE Std 802.1Q, 2003Edition Virtual Bridged Local Area Networks
	IEEE Std 802.1w-2001 Media Access Control (MAC) Bridges — Amendment 2: Rapid Reconfiguration
	IEEE Std 802.1s™-2002 Virtual Bridged Local Area Networks— Amendment 3: Multiple Spanning Trees
	IEEE Std 802.1X-2001 Port-Based Network Access Control
	IEEE Std 802.3ah.-2004 Carrier Sense Multiple Access with Collision Detection (CSMA/CD) Access Method and Physical Layer Specifications Amendment:
	Media Access Control Parameters, Physical Layers, and Management Parameters for Subscriber Access Networks
	IEEE P802.1ad/D6.0 Draft Standard for Local and Metropolitan Area Networks—Virtual

: 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.
Caution: Any changes or modifications to the equipment not expressly approved by the party responsible for
compliance could void user's authority to operate the equipment.

This appliance and its antenna must not be co-located or operation in conjunction with any other antenna or transmitter.
A minimum separation distance of 20 ㎝ must be maintained between the antenna and the person for this appliance to satisfy the RF exposure requirements.