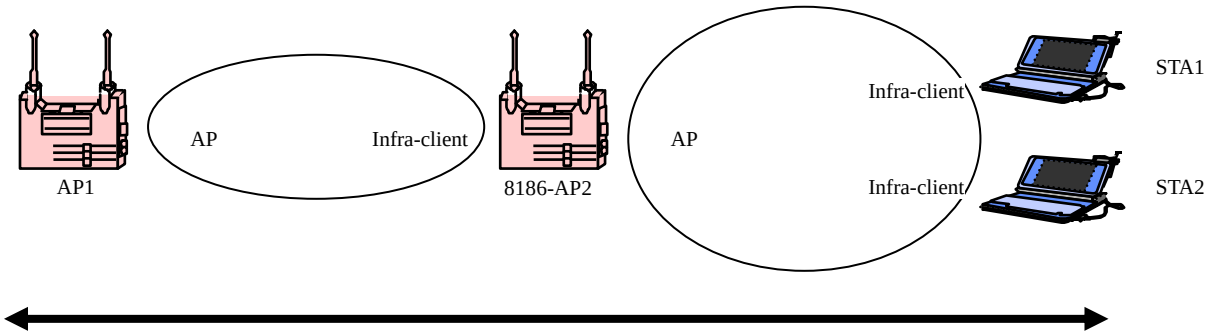
1. Introduction

This document describes what is “Universal Repeater Mode” implemented in RTL8186 reference design. It includes the configuration setting, operation flow, and limitation.

Normally, 8186 could be configured to AP or client respectively. To communicate with other APs, it should enable WDS channel. To use WDS, users must make sure these APs should support this feature. Besides, user may need to set MAC address of peer AP into WDS table before communication. Thus, it will have some limitation to use WDS.

Beside WDS, user may use URM (Universal Repeater Mode) to communicate with other APs. When URM is enabled, besides the AP function, it will behave as an infrastructure-client, which is able to link to another AP.



In above figure, STA1 and STA2 could communicate to AP1 through 8186-AP2. In this case, 8186-AP2 is like as a “Repeater” to forward the packet between AP1 and STA1/STA2.

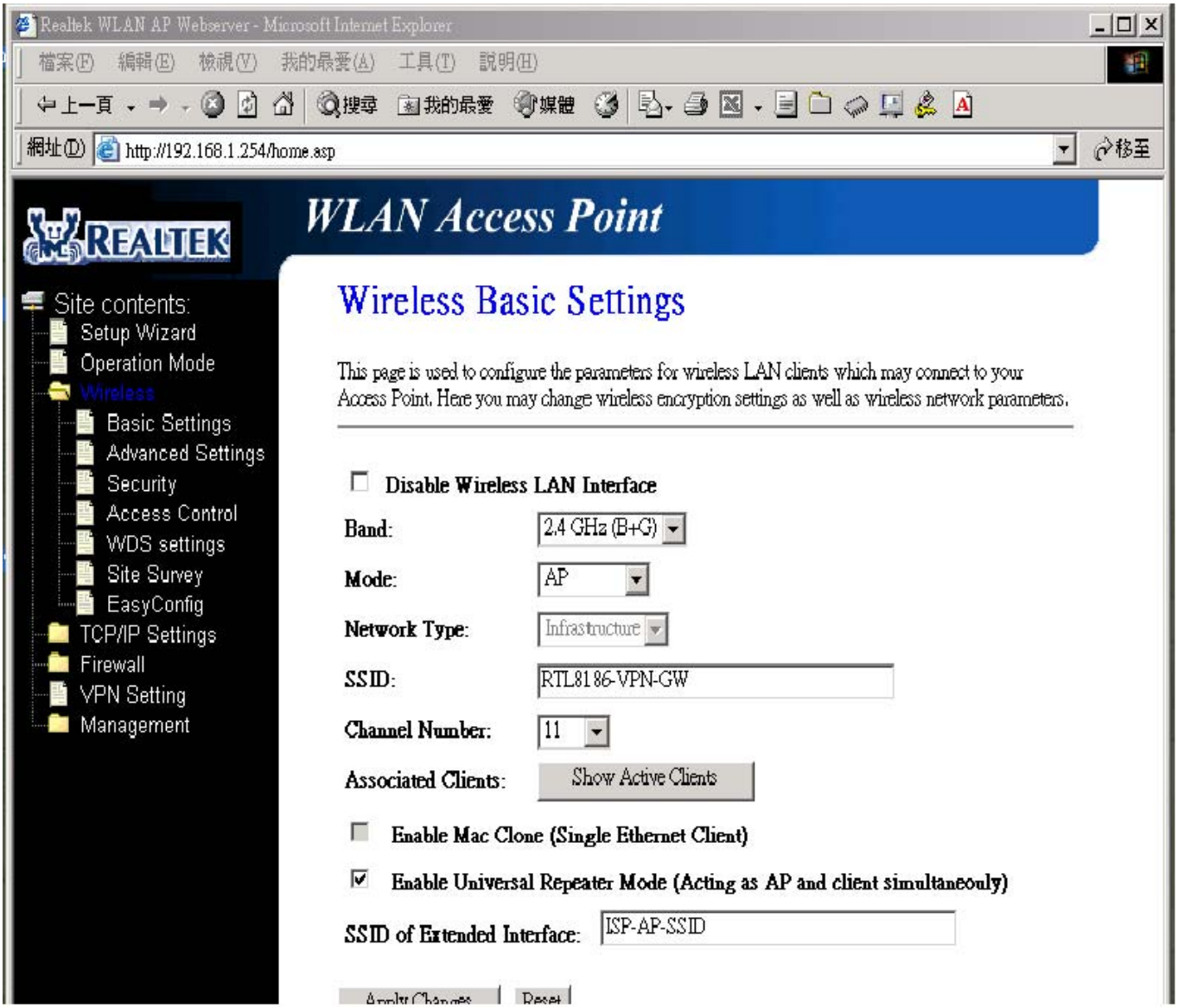
When using URM with WISP (WAN ISP mode) mode, user could let 8186 connect to ISP AP, and act as AP simultaneously in LAN interface. By that, multiple wireless clients could access Internet and share one IP address through 8186.

2. Configuration Setting and Security

User could enable URM in wireless basic setting page as shown in following figure. Please note, only when device is configured to AP or Infrastructure client in root interface, URM could be enabled.

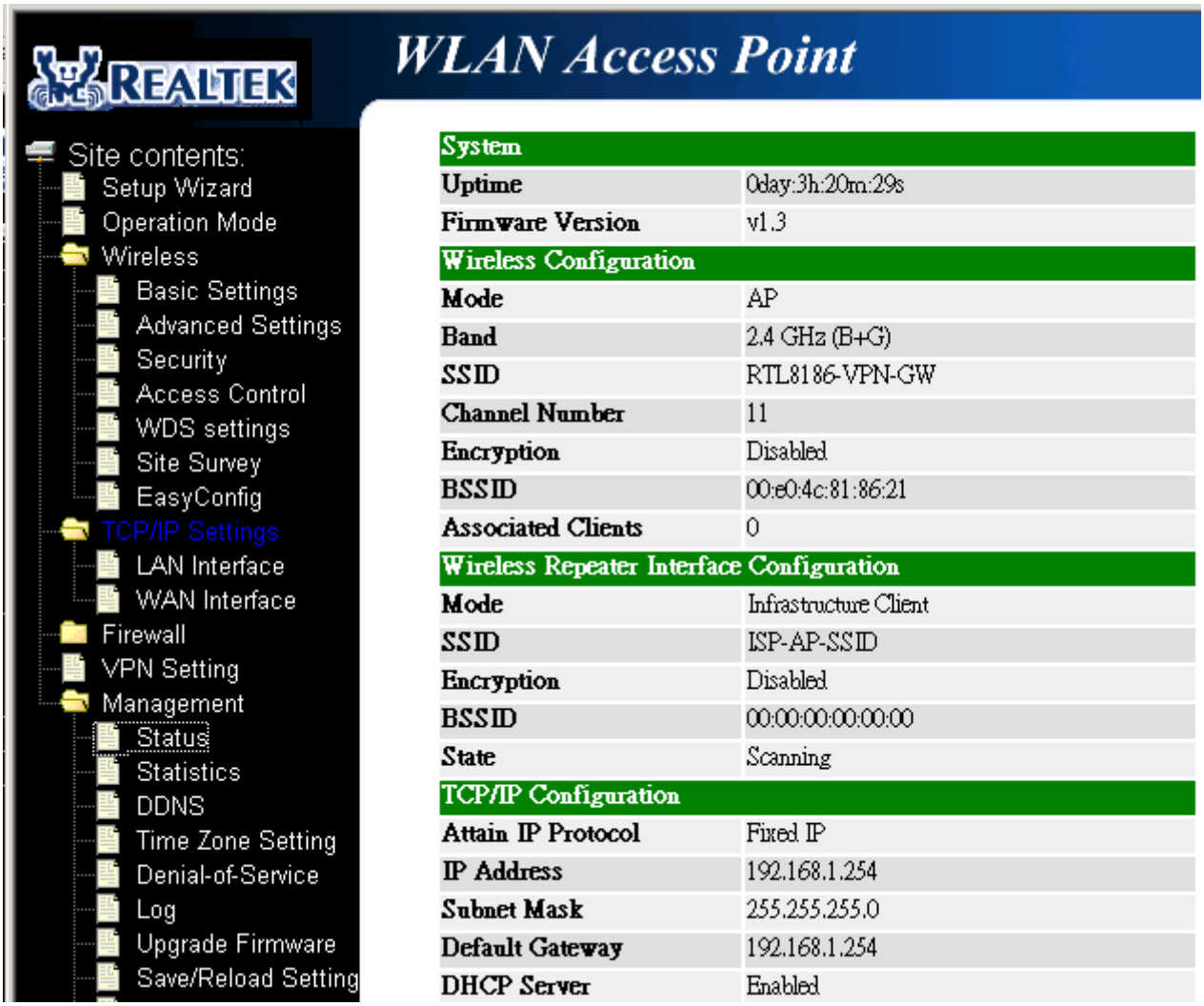
When mode is set to “AP” and URM is enabled, user should input SSID of another AP in the field of “SSID of Extended Interface”. Please note, the channel number should be set to the one, used by another AP because 8186 will share the same channel between AP and URM interface (called as extended interface hereafter).

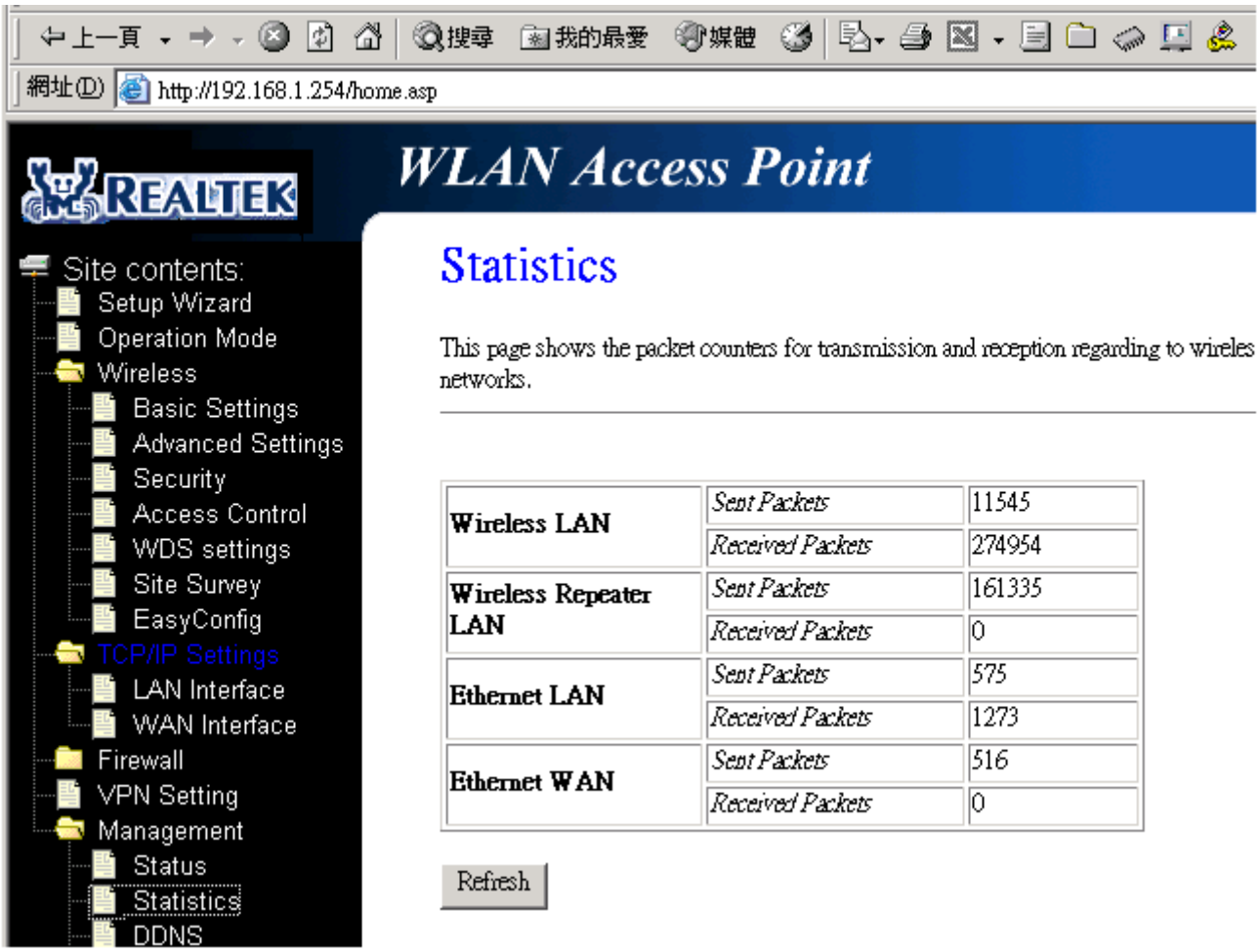
When mode is set to infrastructure client and URM is enabled, 8186 will start the extended AP after it has associated to another AP. In this case, user should set AP SSID into extended interface and the channel number used by 8186 will depend on the AP it has associated with.



When WEP (64bit or 128bit) is selected in security page, both root and extended interface will share the same WEP key. When WPA or WPA2 PSK (pre-shared key) is used, both root and extended interface will share the same passphrase key. Please note, when RADIUS is used in WPA/WPA2 or 802.1x is selected, extended interface will not be able to use encryption.

When URM is enabled, it will display the link status and statistics of extended interface in status and statistic web pages as shown below.


REALTEK
WLAN Access Point
Site contents:
Setup Wizard
Operation Mode
Wireless
Basic Settings
Advanced Settings
Security
Access Control
WDS settings
Site Survey
EasyConfig
TCP/IP Settings
LAN Interface
WAN Interface
Firewall
VPN Setting
Management
Status
Statistics
DDNS
Time Zone Setting
Denial-of-Service
Log
Upgrade Firmware
Save/Reload Setting
System
Uptime 0day:3h:20m:29s
Firmware Version v1.3
Wireless Configuration
Mode AP
Band 2.4 GHz (B+G)
SSID RTL8186-VPN-GW
Channel Number 11
Encryption Disabled
BSSID 00:e0:4c:81:86:21
Associated Clients 0
Wireless Repeater Interface Configuration
Mode Infrastructure Client
SSID ISP-AP-SSID
Encryption Disabled
BSSID 00:00:00:00:00:00
State Scanning
TCP/IP Configuration
Attain IP Protocol Fixed IP
IP Address 192.168.1.254
Subnet Mask 255.255.255.0
Default Gateway 192.168.1.254
DHCP Server Enabled



3. Summary

- When repeater mode is enabled, an extended virtual interface (wlan0-vxd) will be created automatically.
- If root interface is an AP, the extended virtual interface will act as an infra-client. User should set the SSID of extended virtual interface, which will let wlan driver look for the AP with the same SSID. If the SSID is empty or 'ANY', it will search and associate to any AP. Please note, the Infra-client of virtual interface will NOT be able to probe APs among the channels. It will only scan the AP in the same channel as root interface AP used.
- If root interface is an infra-client, the extended virtual interface will act as an AP. The extended virtual AP will be started ONLY when its infra-client (root interface) has associated with an AP successfully. Also, the virtual AP will be started at the channel as root interface used. During roaming on infra-client interface, the virtual AP will be stopped.
- If 'WISP' mode is set (in GW or GW-VPN version), the root interface (wlan0) will bind to WAN port, and extended virtual interface will bind to LAN port (br0).
- When root interface is set to use WEP (64 bits or 128 bits) security, the extended virtual interface will be set to WEP automatically and share the same WEP key.
- When root interface is set to use WPA/WPA2 PSK security, the extended virtual interface will be set to WPA/WPA2 automatically and share the PSK. Please note, when Radius authentication is adopted

in root interface, the security of extended virtual interface will be disabled.

- Since SDRAM size consideration (8M bytes), the repeater mode will be disabled in AP package.