Configuration Manual

Configuration Notes for Cisco 1200 Series AP in Ascom VoWiFi System

2007-08-15/ Ver. B

Contents

1 Introduction

This document is merely intended as a guide when discussing the deployment of Ascom i75 VoWiFi handset in Cisco1200 series WLAN system. This document will describe some of the settings needed to gain good performance when the handset is used with Cisco 1200 series infrastructure. Performance parameters will also be stated.

The settings described are extensions and apply for use with Cisco 1200 series AP only. For more information, see *Function Description Ascom VoWiFi System, TD 92314GB*.

The performance measurements are made with IOS software version 12.3(8)JEA.

For maximum performance consider the recommendations in *Considerations for Ascom VoWiFi System Planning, TD 92408GB*.

Note: It is not within the scope of this document to describe the configuration process of the AP, please refer to the appropriate AP configuration manual.

1.1 Abbreviations and Glossary

AP	Access Point: a radio transceiver providing LAN connection to wireless devices.
AVVID	Architecture for Voice, Video and Integrated Data
BSS	Basic Service Set
CCX	Cisco Compatible Extensions
CoS	Class of Service
DSCP	Differentiated Services Code Point
EDCA	Enhanced Distributed Channel Access
IP	Internet Protocol: global standard that specifies the format of datagrams, and the addressing scheme.
QoS	Quality of Service
STA	Station: a mobile device in an IEEE802.11 WLAN system
U-APSD	Unscheduled Automatic Power Save Delivery
WLAN	Wireless Local Area Network
WMM™	Wi-Fi Multimedia™: offers QoS functionality for WiFi networks.

2 AP Configuration

2.1 Radio Settings

2.1.1 Aironet Extensions

Enable "Aironet extensions" to let the i75 VoWiFi handset make use of CCX for enhanced performance.

2.1.2 Radio Channels

Use only channels 1, 6 or 11. Do not use the option "Least congested channel" since the AP may change the channel on-the-fly and make the RF environment inconsistent.

To use the option "Least congested Channel" can cause loss of speech packets, and in worst case, the call can be disconnected.

2.1.3 Data Rates

The Cisco 1200 series AP has the possibility to select the data rates that shall be used within the BSS. If a data rate is set to "required", the rate will be part of the "BSS basic rate set" that control at which rate broadcast, multicast and control frames will be transmitted.

It is not recommended to set any data rate higher than 12 Mbit/s to "required" since STAs close to the cell boundary may have difficulties to receive broadcast/multicast and control frames at higher data rates.

The AP default setting works fine but if only 802.11g clients shall be allowed to associate, the 6 Mbit/s can be set to "required" to disallow 802.11b clients to associate.

Note: Do not use the setting "Best throughput" since this will make the AP to send broadcast/multicast and control frames with the data rate 54 Mbit/s, making it difficult for STA near the cell boundary to receive such frames properly.

2.2 QoS

2.2.1 If Layer 2 Priority is Used

If VLAN is used and the 802.1p priority tag is preserved throughout the network, the AP will by default classify the packets based on the 802.1p priority tag. No additional classifications are needed.

Note: If a wired Cisco infrastructure with policy shaping is used, the priority of the voice packets may be changed when traversing the wired infrastructure. To make up for differences in Cisco AVVID and WMM priorities, enable the AVVID priority mapping to map packets from CoS 5 to CoS 6.

2.2.2 If Layer 3 Priority is Used

If layer 3 priorities (IP DSCP) are used, classification is needed to map packets with IP DSCP to WMM.

Create a QoS policy that map IP DSCP with Expedited Forwarding to Voice class of service and apply the policy to the 802.11g radio interfaces.

2.2.3 EDCA Parameters

If IOS software version 12.3(8) or later is used, make sure that the "Optimized Voice" button is applied to tune the EDCA parameters for enhanced voice prioritization.

2.2.4 U-APSD

If U-APSD shall be used it is very important that the EDCA parameters are set correctly as described in the EDCA parameters section above.

The QoS must be configured correct, since U-APSD handles a bi-directional data stream where the up- and downlink must be transmitted within the same EDCA Access Category.

3 Call Capacity

The Cisco 1200 series AP can handle up to 35 calls per AP.

However, for normal deployment up to 22 calls per AP can be feasible if no data traffic is present and no channel re-use is needed.

Depending on the data traffic load, cell coverage and co-channel interference, the capacity might be reduced to around 10 calls per AP.

4 Handover Performance

The handover performance is heavily dependant on the chosen security scheme. The authentication process, as well as the exchange of fresh session encryption keys affects the time needed to perform an inter-BSS transition before the transmission of speech frames can be resumed.

The table shows an average of handover times with different security settings. The stated times shall be used to assist in the choice of security scheme and shall not be seen as absolute numbers. A number of factors such as external RADIUS server performance, channel usage etc. will affect the handover time.

Authentication scheme	**Encryption type**	**Handover time**
Open	NONE	~ 10 ms
Open	WEP	~ 10 ms
WPA-PSK	TKIP	~ 35 ms [a]
WPA2-PSK	AES-CCMP	~ 35 ms
LEAP	WEP	~ 60 ms
LEAP	TKIP	~ 70 ms
LEAP with CCKM	TKIP	< 20 ms
PEAP-MSCHAPv2	TKIP	~ 230 ms
PEAP-MSCHAPv2	AES-CCMP	~ 230 ms
PEAP-MSCAHPv2 with PMKSA caching	AES-CCMP	~ 30 ms

a. If WPA-PSK is used in combination with Cisco 1242AG, the timing for TKIP encryption key delivery might result in a longer handover time, up to 130ms.

5 Related Documents

System Description VoWiFi System	TD 92313GB
Function Description VoWiFi System	TD 92314GB
Considerations for Ascom VoWiFi System Planning	TD 92408GB
Configuration Manual i75 VoWiFi Handset	TD 92431GB
Installation and Operation Manual Integrated Message Server (IMS/IP-WiFi)	TD 92322GB
Installation and Operation Manual Portable Device Manager, Windows version	TD 92325GB
Installation and Operation Manual Portable Device Manager, System version	TD 92378GB

Document History

For details in the latest version, see change bars in the document.

Version	Date	Description
A	2006-11-17	First version
B	2007-08-15	– Minor changes in text – Document type name changed from Function Description to Configuration Manual