

Configuration Notes

Trapeze Networks Infrastructure in Ascom VoWiFi System

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1 Introduction

This document is merely intended as a guide when using the Trapeze Networks mobility exchange and mobility points in the Ascom VoWiFi system, and it does not by any means replace the documentation from Trapeze Networks. This document describes some of the settings needed to gain good performance when the Ascom VoWiFi handset is used with the Trapeze Networks infrastructure. Performance parameters will also be stated.

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

The settings described in this document are extensions and apply for use with the Trapeze Networks exchange controllers and mobility points. For more information, see *Function Description VoWiFi System, TD 92314GB*.

Note: The performance measurements are made with Trapeze software version 6.2.0.2.

1.1 Abbreviations and Glossary

BSS	Basic Service Set
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.
MP	Mobility Point: a radio transceiver providing LAN connection to wireless devices.
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 Configuration

2.1 Radio Settings

2.1.1 Radio Channels

Use only channels 1, 6 and 11.

Note: Do not enable auto tune channel or transmit power since these settings will create an inconsistent radio environment.

2.1.2 Data Rates

The Trapeze Networks infrastructure has the possibility to set beacon/probe response rate, multicast rate and data rates separately. The default settings will work fine but to optimize it is recommended to disallow 802.11b clients to associate by setting the 6 MBit/s rate to mandatory in the 802.11g configuration.

It is also highly recommended to disable all lower 802.11b speeds in the Trapeze infrastructure to obtain even higher performance:

- Beacon rate should be set to 6 MBit/s
- Multicast rate should be set to "automatic"
- Transmission rate 1, 2, 5.5 should be disabled
- Transmission rate 6 should be set as mandatory
- Other rates should be set as supported

2.2 Quality of Service (QoS)

2.2.1 If Layer 3 Priority is Used

In order to map to the default Ascom VoWiFi handset configuration the QoS DSCP to CoS mapping shall be set according to the following:

- Voice: DSCP 46 (Expedited Forwarding) shall map to CoS 6.
- Signalling: DSCP 26 (Assured Forwarding 31) shall map to CoS 4.

Vice versa applies to the CoS to DSCP:

- Voice: CoS 6 shall map to DSCP 46.
- Signalling: CoS 4 shall map to DSCP 26

2.2.2 WMM Power Save

If U-APSD shall be used in the handset it is very important that the WMM parameters in the Mobility Exchange are set correctly as described in [2.2.1 If Layer 3 Priority is Used](#).

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

To use U-APSD, make sure to enable U-APSD for the current radio profile and set QoS mode to WMM for the voice configuration.

2.3 Security Settings

2.3.1 Opportunistic Key Caching

Opportunistic Key Caching is enabled by default. This enables high security with fast roaming.

3 Call Capacity

If voice power save mode "Active" is used the Trapeze Networks infrastructure can handle up to 22 calls per MP. If voice power save mode "U-APSD" is used it can handle up to 20 calls per MP.

However, for normal deployment up to 18 calls per MP can be handled, 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 MP.

If using 802.11bg (instead of a pure 802.11g system) it is not recommended to use more than 6 calls per MP.

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 seen as a guide and an assistance 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	~ 17 ms
Open	WEP	~ 10 ms
WPA-PSK	TKIP	~ 87 ms
WPA2-PSK	AES-CCMP	~ 67 ms
PEAP-MSCHAPv2 with opportunistic key caching	AES-CCMP	~ 57 ms

5 Limitations

The Ascom VoWiFi handset does not work well with mobility points of type MP-372. The recommendation is to use MP-422 throughout the system.

6 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

7 Document History

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

Version	Date	Description
A	26 Mars 2008	First released version
B	14 October 2008	Limitation chapter added
C	23 February 2010	Software version changed