

Configuration Manual

Notes for Aruba Networks Infrastructure in Ascom VoWiFi System

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1 Introduction

This document is merely intended as a guide when using the Aruba Networks mobility controllers and access points in the Ascom VoWiFi system, and it does not by any means replace the documentation from Aruba Networks. This document describes some of the settings needed to gain good performance when the Ascom VoWiFi handset is used with the Aruba 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 Aruba Networks mobility controllers and access points. For more information, see *Function Description Ascom VoWiFi System, TD 92314GB*.

Note: The performance measurements are made with Aruba software version 3.0.0.0, 3.1.0.8 and 3.1.1.0.

1.1 Abbreviations and Glossary

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

2.1 Radio Settings

2.1.1 Radio Channels

Use only channels 1, 6 and 11.

2.1.2 Data Rates

The ARUBA Networks infrastructure has the possibility to select the data rates that shall be used within the BSS. If a data rate is a part of the "BSS basic rate set" it will control at which rate broadcast, multicast and control frames will be transmitted.

It is highly recommended to disable all 802.11b speeds in the Aruba system to obtain optimal performance. The "BSS basic rate set" should be set to 6 MBit/s or 12 MBit/s since STAs close to the cell boundary may have difficulties to receive broadcast/multicast and control frames at higher data rates.

The default setting works fine but if only 802.11g clients shall be allowed to associate, the 6 Mbit/s can be set as part of the "BSS basic rate set" to disallow 802.11b clients to associate.

2.2 QoS

2.2.1 If Layer 3 Priority is Used

The Aruba system uses fixed layer 3 (IP DSCP) to layer 2 (WMM) classifications. In order to obtain correct mapping for Voice packets the i75 must be configured in accordance with these fixed classifications. The settings to use in the i75 are; Voice DSCP = 0x30 (48, Class Selector 6) and signalling DSCP = 0x1a (26, Assured Forwarding 31).

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 AP 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.

2.2.3 Disable Traffic Management Profile

It is not recommended to use bandwidth management. To disable dot11g-traffic-mgmt-profile use following configuration command:

```
ap-group "default" no dot11g-traffic-mgmt-profile
```

2.3 Security Settings

2.3.1 Opportunistic Key Caching

It is recommended to use Opportunistic Key Caching instead of PMKSA caching and WPA2 PreAuthentication. Opportunistic Key Caching (also called Proactive Key Caching) is used to reduce latency and overheads in the authentication process.

3 Call Capacity

If voice power save mode "Active" is used the Aruba Networks infrastructure can handle up to 34 calls per AP. If voice power save mode "U-APSD" is used it can handle up to 26 calls per AP.

However, for normal deployment up to 20 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.

If using 802.11bg (instead of a pure 802.11g system) it is not recommended to use more than 6 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 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	~ 8 ms ^a
Open	WEP	~ 8 ms ^a
WPA-PSK	TKIP	~ 55 ms ^b
WPA2-PSK	AES-CCMP	~ 39 ms ^a
PEAP-MSCHAPv2 with opportunistic key caching	AES-CCMP	~ 32 ms ^a

a. Tested on Aruba 2400

b. Tested on Aruba 800

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	2007-08-27	First version