



Vocera WLAN Infrastructure Requirements and Best Practices

This document provides a summary of required settings and best practices for Vocera system implementations. More detailed information can be found in the **Vocera 4.1 Infrastructure Planning Guide** available for download at: <http://vocera.com/products/documents/InfrastructureGuide.pdf>.

WLAN Settings

Required Settings	
Voice Grade Site Survey	Required
Max AP Transmit Power	~30mW
Minimum Power Coverage	-65dBm
Minimum SNR	25
Beacon Interval	100
DTIM	1
ARP Cache	Disabled
Priority Queue	Highest - Voice
Public Secure Packet Forwarding	Disabled

Recommended Settings	
Basic Data Rates	Determined per site
Supported Data Rates	All Enabled
Channel Plan	1, 6, 11
Badge Roam Threshold	2 - May adjust based on AP density or Meru Virtual Cell
Max Number of SSIDs	5
Client Exclusions	Disabled
Authentication Timeout	1 full shift
EAP Retry Timeout	< 3 Seconds

Multicast Recommendations	
IGMP on Badge	Enabled
Not using IGMP on Network	<ul style="list-style-type: none"> Must be L2 only network IGMP Snooping must be disabled on all L2 devices in audio path
IGMP Enabled on Network	<ul style="list-style-type: none"> IGMP version 2 Multicast routing must be enabled on all router interfaces in the multicast audio path PIM (Sparse Mode or Sparse-Dense Mode) must be enabled on all router interfaces in the multicast audio path Enable IGMP Snooping on all L2 devices in the multicast audio path

Vocera Recommendations for Cisco LWAPP

Cisco Settings	
Code Version	Most recent AssureWave certified
RRM - Dynamic Channel Assignment (DCA)	OK
RRM - Dynamic Transmit Power Control (DTPC)	OK, if max power is level 3 or less
Coverage Hole (CHA)	<ul style="list-style-type: none"> Coverage Profile = 3dB Client min exception > 3
Transmit Power Threshold	Adjust to fit site
Aggressive Load Balancing	Disabled
Multicast Mode	Multicast
Multicast Tx Data Rate	Highest Basic rate
Unicast ARP	Disabled
WMM	Optional
DHCP Required	Disabled
Symmetric Tunneling	Enabled, if Reverse Path Filtering is enabled
Priority Queue	Platinum

Vocera Recommendations for Aruba

Aruba Settings	
Code Version	3.3.2.x, 3.4.0.x, 3.4.1
Role	Voice
ARM	Enable
<ul style="list-style-type: none"> Voice Aware Scanning Max Tx Power Min Tx Power 	Enable 15 12
Tx Data Rates	1, 2, 5.5, 6, 9, 11, 12, 18, 24
Max Retries	4
Probe Retry	Disable
Max Tx Failure	25
Session ACL	vocera-acl
Mcast-rate-opt (needed for multicast to go at highest rate)	Enable



⚙️ Vocera Recommendations for Meru

Meru Settings	
Code Version	3.6.1 MR2 (3.6.1-41)
SSID	Separate for Vocera
IGMP Snooping	Enable
QOS Rules	Enable QoS Rules 7 & 8 (Enabled by Default)
Virtual Cell ¹	Enable
• Badge Roam Policy	1
• Silent Client Polling	Enable
Vocera Location Feature	Disable Virtual Cell or divide APs into zones

¹ A Transmit Power Asymmetry problem may arise at the edges of Virtual Cell coverage if an AP's transmit power is higher than the Vocera device (~30mW). To avoid poor audio at the edges of the Virtual Cell, the RSSI of the Vocera device on the AP must be verified. The Vocera device should never drop below an RSSI of -75dBm on the AP.

⚙️ WLAN Ports Used by Vocera Clients

Client	Direction	Server / Client	Type	Protocol	Ports
Badge	To/From	VS	Signaling	UDP	5002
Badge	To	VS	Audio	UDP	5100-5199
				TCP	5100-5199
Badge	To/From	Badge/VS/VTS	Audio	UDP	5200
Badge	To	VTS	Audio	UDP	5300-5399
Badge	To/From	Updater	Signaling	UDP	5400
Badge	To/From	VS	Discovery	UDP	5555 & 5556
Badge	To/From	VS	Connection	TCP	5555 & 5556
Badge	To	VCG	Audio	UDP	6300-6555
Smartphone	To/From	VCG	Signaling	UDP	5060
Smartphone	To	VCG	Audio	UDP	7700-8467
Smartphone	From	VCG	Audio	UDP (RTP)	50000-50255
Smartphone	To/From	FTP Server	MSP / FTP	TCP	20 & 21
Smartphone	To/From	FTP Server	MSP / FTP	UDP	> 1023

For the complete list of ports used by the Vocera system in the **Vocera 4.1 Infrastructure Planning Guide** available for download at: <http://vocera.com/products/documents/InfrastructureGuide.pdf>.

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