

# Ruckus VoWLAN Implementation with Vocera

## Introduction

The Vocera® communications system enables instant, wireless voice communication that users control with naturally spoken commands. This easy-to-use system is ideal for hospitals, hotels, retail stores, and other in-building environments where mobile workers need to stay connected to perform their jobs.

The Vocera communications system consists of two key components: the Vocera system software that controls and manages call activity, and the Vocera B1000/B2000 communications badge, a lightweight, wearable, voice-controlled communication device that operates over a wireless LAN (802.11b/g).

The Ruckus ZoneFlex system is a centrally managed WLAN system comprising of controllers and a variety of 802.11 a/b/g/n APs. There are two unique features in the ZoneFlex product that enhance voice communications. One is BeamFlex, our smart beamforming antennas. The second is SmartCast, our traffic management engine. BeamFlex combines a compact internal antenna array with expert control software to continuously rank the antenna configurations for each receiving device and reconfigure in real-time to bypass interference and physical barriers. SmartCast provides automatic flow classification, software pre-queuing per station and per packet scheduling of traffic over the smart antenna array. It applies heuristics to automatically classify voice packets and place them in the right queue.

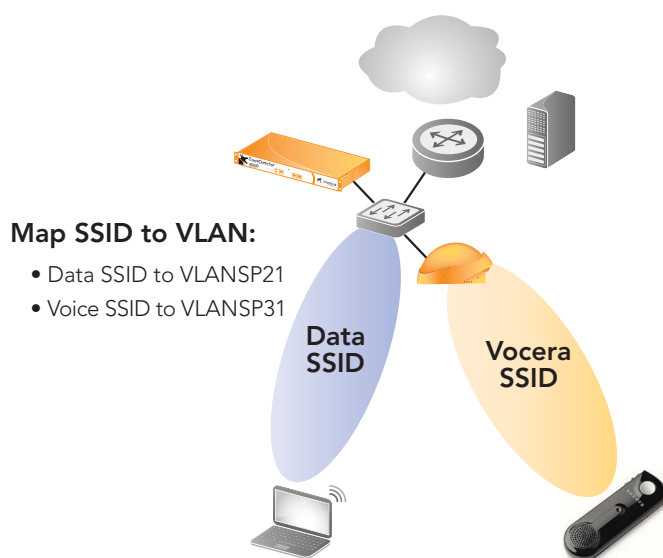
This deployment guide describes how to optimally configure a Ruckus ZoneFlex system to support a Vocera voice implementation. For more details on how to configure the Vocera system, documentation is available at <http://www.vocera.com/products/resources/documentation.aspx>.

## Create separate SSID/VLAN for Vocera voice

It is recommended to create a separate voice WLAN for the Vocera badges — separate from other data WLANs as shown in Figure 1. Typically traffic from this WLAN is also tagged with a unique VLAN for the Vocera traffic over the wired network.

To create a separate SSID/VLAN for voice on ZoneFlex, go to Configure-->WLAN-->Create New and create an SSID for Vocera voice, as shown in Figure 2.

**FIGURE 1:** Configure a separate voice and data SSID/VLAN for voice on ZoneFlex



Next, select the appropriate security settings for this SSID. Ruckus ZoneFlex supports all the standards based security settings supported by the Vocera B1000 and B2000 badge systems, as shown below.

Next, under the Advanced Options, select Attach VLAN Tag and enter the appropriate VLAN number, as shown below.

**FIGURE 2:** Create a separate SSID/VLAN for voice on ZoneFlex

The screenshot shows the Ruckus ZoneFlex configuration interface. The 'WLANs' section is active, and the 'Create New' form is displayed. The form includes the following fields and options:

- Name/SSID:** Vocera
- Description:** Voice SSID
- Authentication Method:** Open
- Encryption Method:** WEP-128 (104 bit)
- WEP Key:** 14EAF0067157D1E233DCB82130
- Options:**
  - Guest Usage:  This WLAN is for Guest Access
  - Web Authentication:  Enable captive portal / web authentication
  - Authentication Server: Local Database
  - Wireless Client Isolation:  Enable Wireless Client Isolation
  - Zero-IT Activation:  Enable Zero-IT Activation
- Advanced Options:**
  - Access Controls: No ACLs
  - Rate Limiting: Uplink Disabled, Downlink Disabled
  - VLAN:  Attach VLAN Tag 31
  - Hide SSID:  Hide SSID in Beacon Broadcasting
  - Tunnel Mode:  Enable Tunnel Mode

Choose Configure-->WLAN-->Create New SSID for Vocera voice. Then choose the appropriate security settings and map SSID to VLAN.

### AP Placement and Site Survey Consideration

Now that an SSID for Vocera has been created, it is time to look at AP placement and site survey considerations for good voice performance. A Voice Grade Site Survey as described in the Vocera Infrastructure Guide should be performed using appropriate professional survey tools such as those referenced in the guide. A Badge Evaluation Survey should be performed to validate and confirm appropriate coverage and performance as outlined in the Voice Quality section of the guide.

A summary of the key recommendations from the guide for convenience:

- Survey with actual badge — B1000 or B2000, instead of a laptop.
- Different metrics are used in the Vocera system for the two different badge types — CQ (Comm Quality) for B1000, and SNR for B2000.
- With the badges set to the default roaming policy, Vocera and Ruckus recommends the following values:
  - CQ  $\geq 24$  (B1000)
  - SNR  $\geq 20$  (B2000)

Please refer to the Acceptable Voice Quality section in the Vocera Infrastructure Guide for additional details.

- The badge should be worn on the body, like in normal use, instead of holding it in the hand away from the body, to replicate real-user conditions.
- Use the beeps (audio) feature in the badges to ensure good signal.
- For Ruckus ZoneFlex APs (2942, 7942, 7962) that are ceiling mounted (most common), ensure the AP is mounted dome-down for best signal levels.

To put the badges into survey mode, the following steps must be followed for the B1000 and B2000 badges. There will be differences in procedure depending on whether the badge menus are hidden or not, so for the complete instructions, the user should reference the appropriate sections of the Vocera Infrastructure Guide under the Coverage section, and the Badge Configuration Guide. <http://www.vocera.com/products/resources/documentation.aspx>

### For B2000

1. Press the Hold/DND button to put the badge in Do Not Disturb (DND) mode.
2. On the main menu of the badge, scroll to display the info icon.
3. Use the Select button to display the Info menu.
4. Scroll down until RADIO appears, then select it.

### For B1000

1. Turn on B1000 (remove battery and re-insert)
2. As you turn it on, press Hold/DND button within 3 sec.
3. You will see config menu on screen
4. Use the 3 keys on the side – top, bottom for scrolling, and middle one to select
5. Scroll to RADIOTEST, select it

### Additional Configurations and Settings

In addition to the above settings, there are a few advanced settings to consider:

#### Mesh Mode

Ruckus does not recommend running a Vocera voice over a mesh network — hence mesh must be disabled on the controller for a Vocera application. If mesh is already enabled, factory reset the ZoneDirector controller, and do not select mesh operation.

#### Quality of Service Settings

Ruckus prides itself on being simple to deploy and manage. In the case of QoS, voice traffic will be automatically classified by the SmartCast traffic engine and placed in the appropriate 802.11e queue. ZoneFlex supports QoS both on the B1000 that does not support WMM, and the B2000 (WMM enabled) badge. There are no settings to configure by the user.

#### Background Scanning

Background scans are performed by APs to evaluate radio channel usage. The process is progressive; one frequency is scanned at a time. This scanning enables rogue device detection, AP locationing, and self-healing. The default background scan setting is 20 seconds. Ruckus recommends using the default setting.

#### Support for Multicast with IGMP

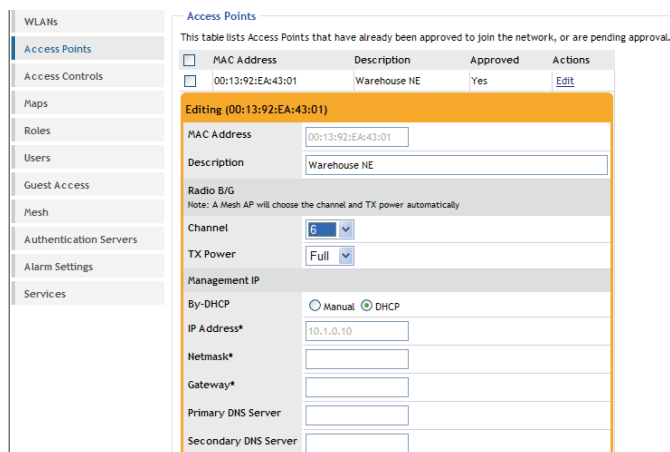
Ruckus recommends turning on IGMP for multicast, which is enabled out of the box. Users should verify that IGMP is enabled on the Vocera system.

#### AP Automatic Channel Settings

The Ruckus ZoneFlex system will automatically select the best channel settings for the APs in the WLAN. These automatic settings work well for a Vocera implementation. However, there are times when a hard-coded channel plan may be desired. Do this by going to Configure-

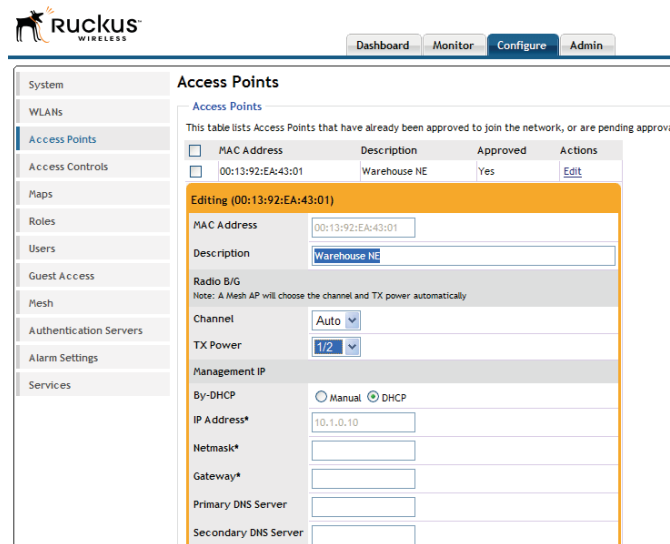
->Access Points and selecting a specific channel, as shown in Figure 3.

**FIGURE 3:** Configure access points with fixed channel and TX power settings



The Ruckus ZoneFlex system automatically selects the best channel and power settings for your network. If there is a channel/power plan, then configure them through the menu.

**FIGURE 4:** Configure access points with 1/2 TX power



Here the APs are configured for automatic channel selection by the ZoneFlex system, but TX power is manually set to 1/2 power.

#### AP Automatic Power Settings

The Ruckus ZoneFlex system will automatically select the best power settings for the APs in the WLAN. These automatic settings generally work well for a Vocera implementation.

In a voice enabled WLAN, however, there does exist the problem of power asymmetry, where the TX power of a low-power, battery-enabled device, like a Vocera badge, is much weaker than the TX power of an AP. This can cause asymmetric voice quality, where downstream quality is better than upstream quality.

To address this, Ruckus recommends lowering the TX power of the Ruckus AP to ½ power. Do this by going to Configure--> Access Points, and selecting ½ power from the TX Power drop down menu.

### Summary

For best results, separate the Vocera voice traffic from data traffic for both Wi-Fi SSIDs and wired network VLANs. Follow the site survey methods described in the Vocera Infrastructure Guide (<http://www.vocera.com/products/resources/documentation.aspx>). In typical installations the Vocera and ZoneFlex systems work well with standard factory settings. A few advanced settings may be necessary for Smart Mesh, automatic channel and power settings to accommodate custom configurations.

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