Responder® 5 Integration to Vocera B2000 Badges & Emergin Orchestrator Middleware

This document is meant to educate our authorized Rauland Distributors and customers to make informed architecture decisions, to expedite installation, and to avoid unexpected operational limitations.
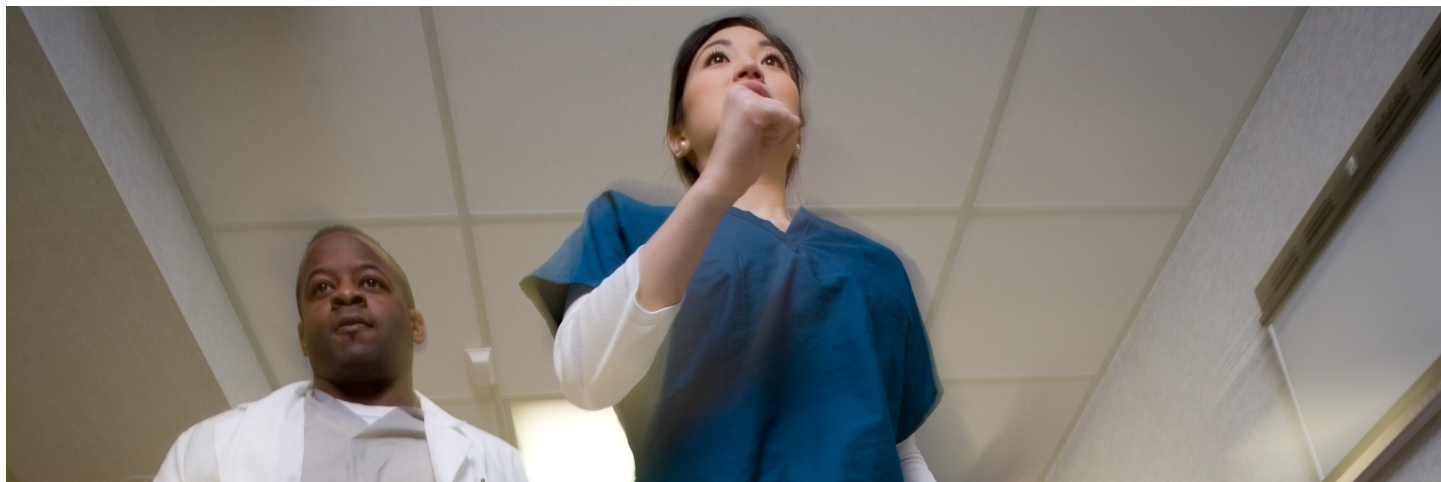
A more technical evaluation of the Responder 5, Vocera Wireless Badges, and Emergin middleware integration is available as a Technical Note.

A comparison of Vocera/Emergin integration performance to other solutions is available as a generic Responder 5 Telephony Overview.

System Overview

Wireless phone integration is a core communication element in a nurse call system. It can be a significant time saver, allowing mobile staff to answer patient calls without going to the nurse station or the patient room. Advances in voice recognition, as well as the adoption of text messaging, has increased the communication options in healthcare facilities.

As technology continues to evolve, pioneering wireless phone and nurse call vendors are utilizing VoIP and SIP solutions which exhibit enhanced performance and platform simplicity, but require different equipment and system architectures than in the past.

Often a facility will operate with multiple wireless solutions, making the implementation and architecture considerations even more important than before.

A patient call from Responder 5 is sent as a TAP alert through Emergin Orchestrator middleware and the Vocera Wireless Phone System to the Vocera B2000 Badges. Answering a call is an automated telephony dial back sequence controlled by the middleware via the facility PBX.

Because the Responder 5 is a SIP compatible product, a SIP Registrar / SIP Proxy Server is required for operation. Rauland-Borg uses a Brekeke SIP Server (www.brekeke. com) for automatic registry of SIP call endpoints (patient stations, consoles, staff terminals, etc.) on the nurse call system.

A VoIP Gateway, sometimes referred to as a Media Access Gateway, is required to translate the telephony signaling and audio into the SIP standard protocol used by Responder 5.

System Architecture

Refer to Figure 1:

- A patient places a call.

- The Responder 5 sends a TAP alert to the Emergin middleware. The Emergin middleware translates the alert into a Vocera-specific alert command to page the Badge.

- The staff initiates a Vocera answer sequence and Vocera/Emergin read the answer sequence and dial the VoIP Gateway (Patton) through the PBX.

- The VoIP Gateway hears the room/bed number and sends a SIP call request (INVITE) through the Brekeke SIP Registrar/Proxy Server.

- The Responder 5 sends an acceptance response (OK) and 1 way audio (RTP) begins from the nurse call system to the VoIP Gateway which converts to T1/Analog, etc. to reach the PBX and Vocera Badge.

- The VoIP Gateway hears the acknowledge (ACK) to begin the return audio (RTP) with the nurse call system.

Figure 1
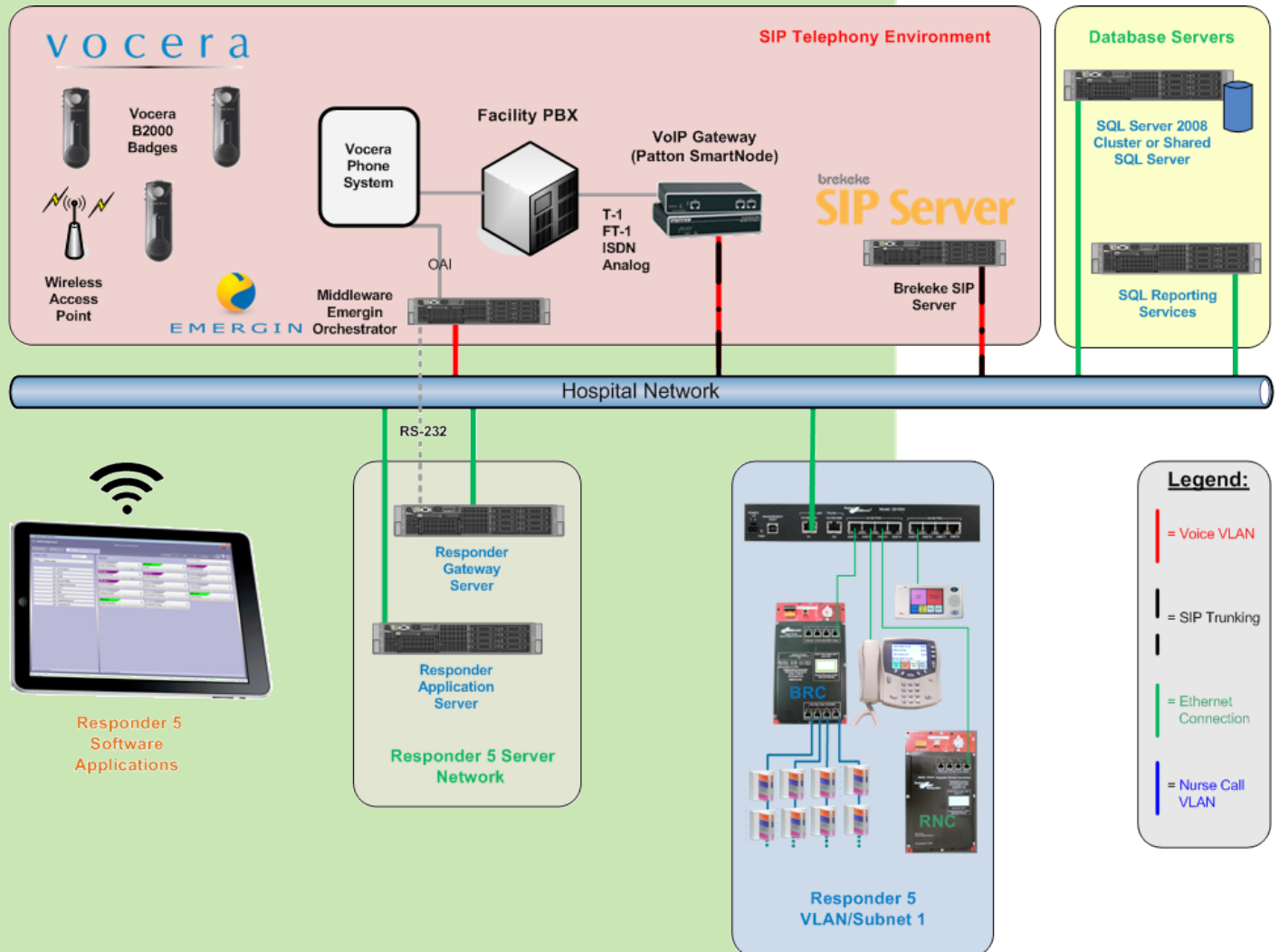
Integration Solution Performance Characteristics

The capability of the Responder 5 nurse call system to integrate to a particular wireless phone system is not just a true or false answer. Every Responder 5 / integrator / wireless phone combination has a unique set of performance characteristics dependent upon many factors including:

- capabilities of the handset models involved
- versions of firmware and software within each model
- facility network configuration
- facility PBX features
- facility network and phone traffic
- intended use of the integrated solution

Rauland has tested the Vocera B2000 Badge and Emergin middleware integration solution in a limited lab environment, with results as shown in Figure 2. While the performance of an integration in an actual healthcare facility environment will differ, the results listed here can be used as a guideline for further customer research, so that a facility can make an educated decision about the best integration solution based on pricing, capacity, technology platform, reliability, product maturity, the comfort level the facility has with the vendor, and the importance of each of the listed performance characteristics.

Figure 2

Feature	Results	Notes
Protocol	TAP & SIP	
Call Display Response Time	5 sec	
Patient Call Answer Connect Time	7 sec	Use of an Analog Gateway may add 3 sec. to response time
Voice Command to Call Bed	1 sec	
Code Team Call Display Time	7 sec	Team of 2 Badges validated
Display Capacity for Calls	60 characters	"Area + Room + Bed + Call/Service"
Display Scrolling	YES	Max scroll length 256 characters
Audio Volume Compatible	YES	Similar to nurse console audio
Set Service from Handset		Not implemented in test. Contact Vocera for information on sending DTMF tones
Call Waiting Audible Alert	YES	The first patient call beeps at a Badge involved in non-nurse call audio
Responder 5 Application Features		
Tag Message (service based)	YES	Display capacity: 27 characters
Free Text Message (staff based)	YES	
SIP / Telephony API Features		
Unique Rings by Priority	3	Telephony API solutions support unique rings
Compatibility with Voice Mail	YES	Telephony API solutions are compatible with Voice Mail
Busy signal at handset	YES	When answering a patient call when audio is already established