

*This document summarizes the requirements and recommendations to install, configure, and maintain a shared wireless or wired network for Mindray Accutorr 7 Vital Signs Monitors in spot check mode.*

*Implementation and maintenance of an appropriately configured shared network is the sole responsibility of the institution. Mindray recommends that a hazards analysis per IEC 80001 be performed to determine if any issues exist that should be mitigated to ensure patient safety and data security.*

### General

- In typical configuration:
  - Accutorr 7 networked to eGateway
  - Dedicated eGateway networked to EMR, ADT server, and NTP server
- Accutorr 7 can be used in wireless or wired environment
- Up to 600 Accutorr 7s can be supported on hospital network
- Each eGateway can support up to 200 Accutorr 7s
- Up to 3 eGateways may be used on single network

The Accutorr 7 has been tested and verified for network use using Cisco wireless network equipment. The following equipment and their software versions were used:

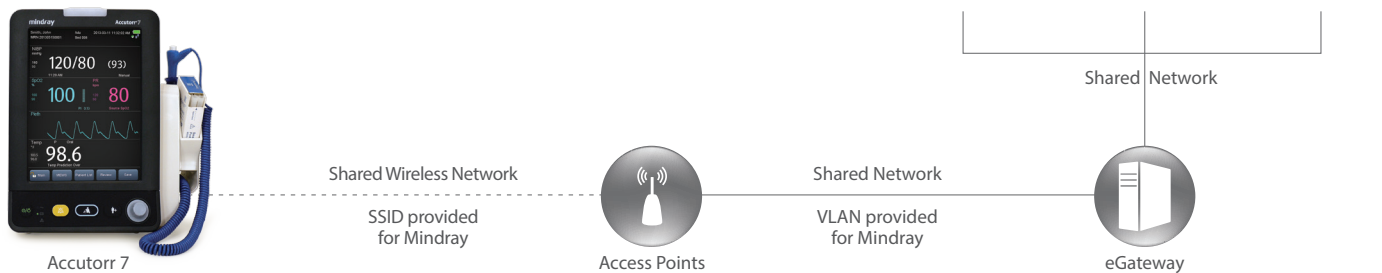
- Cisco AIR-CT2504-5-K9 Wireless Network Controller (IOS 7.4.121.0, Bootloader 1.0.18)
- Cisco AIR-CAP2602I-A-K9 Access Points (IOS 15.2.2.JB3)

### Requirements

#### General

- Flat network deployment with dedicated VLAN and SSID

### Recommended Network Topology for Wireless Accutorr 7 Deployment



- 10 Kbps of bandwidth between Accutorr and eGateway
- NTP server to supply network time to eGateway and Accutorr 7s
- Maximum allowable average RTT jitter on network: 5%
- Maximum allowable packet latency on the layer 2 network: 50 msec
- Maximum allowable packet latency on the layer 3 network: 100 msec
- VPN access to eGateway for remote servicing

#### Wired

- Only Mindray approved devices shall be deployed on VLAN designated for Mindray's use
- No routing shall be enabled between institution supplied VLAN designated for Mindray's use and any other VLAN or subnet
- No ports shall be configured to allow access to institution supplied VLAN designated for Mindray's use except for those needed to connect eGateway to wireless network

#### Wireless

- Wi-Fi settings:
  - Protocol: 802.11a, 802.11b, 802.11g, 802.11n at 2.4 GHz, and 802.11n at 5 GHz
  - Authentication: WEP, WPA PSK, WPA2 PSK, WPA Enterprise, WPA2 Enterprise, and CCKM
  - Encryption: TKIP and CCMP when using WPA, CCMP when using WPA2, TKIP and CCMP when using CCKM
- Communication modes: wireless network must support multicast
- IP address management: static, DHCP
- Minimum allowable signal-to-noise ratio (SNR): 25 dB

- Minimum allowable signal strength: -65 dBm
- Co-channel separation: greater than 20 dB (At any location signal strength of one AP must be 20 dB greater than any other AP on same channel for coverage on that channel)
- DTIM interval: Set to 1
- UDP Multicast support required
- Only Mindray approved devices shall be deployed on SSID designated for Mindray's use

### Recommendations

#### General

- Redundant power supplies and backup power for all network infrastructure equipment

#### Wired

- Minimum of gigabit Ethernet for switch-to-switch and switch-to-wireless controller connections
- Minimum of 100 MB Ethernet connections between switches and access points

#### Wireless

- Use of WPA2 in a PSK or enterprise mode, with CCMP is highly recommended
- Use of WEP strongly discouraged

### Responsibilities

#### Mindray

- Installing Accutorr 7s and eGateway
- Connecting Accutorr 7s and eGateway to institution supplied shared network
- Verifying connectivity between Accutorr 7 and eGateway

#### Customer

- Verifying that institution supplied shared network meets all requirements listed above
- Providing service with VPN client access to eGateway prior to installation

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