Practicalities of Deploying Wireless LANs In Healthcare Facilities

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AGENDA

✓ The Increasing Need for Wireless in Healthcare Facilities

✓ Unique Challenges within the Healthcare Facilities

✓ Deployment of Wireless LANs - Policies, Standards, Procedures
The Increasing Need for Wireless In Healthcare Facilities
Deploying WiFi in Healthcare Facilities

Growing demand for High Bandwidth Wireless Networks in Healthcare

- Growth in Wireless Healthcare Apps
- Use of wireless hand held mobile devices for clinic technicians
- Surge in Wireless medical devices
- Growth of Inpatient wireless medical devices
• **Growing demand for High Bandwidth Wireless Networks cont...**

  • **Voice over Wireless – Will increase significantly**
    (Source: Cisco VNI Mobile, 2016)

  ![Diagram](image)

  • **High growth in Consumer and enterprise use of the wireless network**
• The Increase of Wireless Mobility and the Benefits

• Wearable Wireless monitoring devices

• Less time in the hospital/doctor office
  - Decreases patient costs

• Real time monitoring of vitals

• Can help decrease re-admissions

• Fewer accessories requiring infection control

• Less wires

(Source: WiFi Alliance)
Deploying WiFi in Healthcare Facilities

WiFi Medical Telemetry Devices quickly emerging for Mobility
(Source: WiFi Alliance and FCC 00-211)

• Wireless cardiac monitors implanted or worn
• Physicians Wireless handheld PDAs
• RFID-RF identification
• Implanted micro-stimulator
• Body sensors used to monitor and control various patients’ functions
• Body sensors w/remote monitoring - home

By the end of this year, 60% of the carrier network traffic will be offloaded to the WiFi Infrastructure
Summary

Healthcare “High density” Wi-Fi design

• The Healthcare WiFi infrastructure must accommodate many users, much greater densities and be more robust

• Considerations for Hospital Enterprise Wireless and Consumer Wireless

• Considerations for Cell based offloading to the WiFi Infrastructure

• Make Moves, adds, changes, and maintenance low cost, quick, and easy.

(Source: BICSI 004)
Unique Challenges and Considerations Within Healthcare While Planning for the Wireless Network (WLAN)
Consider “Grades” of Hospital Wireless Services

- **Medical Grade – Life Critical**
  - Support clinical devices and apps to collect and share life critical medical info

- **Enterprise Grade – Mission Critical**
  - Support health devices and apps that inform and direct

- **Consumer Grade – Inform**
  - The wireless service that supports consumer devices and apps to inform.

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**Five Measures That Define Assurance**

<table>
<thead>
<tr>
<th>Grade</th>
<th>Coverage</th>
<th>Signal</th>
<th>Capacity</th>
<th>Security</th>
<th>Certainty</th>
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<tbody>
<tr>
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<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>Maximum</td>
<td>100%</td>
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<tr>
<td>Enterprise</td>
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<td>95%</td>
<td>95%</td>
<td>High</td>
<td>95%</td>
</tr>
<tr>
<td>Consumer</td>
<td>90%</td>
<td>90%</td>
<td>Best Effort</td>
<td>Limited</td>
<td>90%</td>
</tr>
</tbody>
</table>

All requiring a robust wireless system that is ready for future technologies and quick upgrades

Source: BICSI-Medical Grade Utility Wireless Supplement
WLAN Challenges

- The burgeoning connected health ecosystem, including BYOD
- Engineering a future ready WiFi infrastructure
- A Wireless infrastructure that involves no above ceiling modifications

- The increasing use of Wireless medical devices
- Enabling a higher quality of care and patient safety at a lower cost
- Satisfying Healthcare Codes, Compliances, Procedures - ICRA, HIPPA, NEC

(Source: BICSI – Medical Grade Wireless Utility Supplement)
Challenges include Structural Environments in Hospitals

- Hospital construction above ceiling is a system-dense environment which includes:
  - Mechanical
  - Medical gas distribution
  - Ventilation Systems
  - Chilled water plumbing

- Hospital wall and floor building construction is unique to the healthcare facilities

- Contributing to the complexity of planning a wireless network

(Source: BICSI – Medical Grade Wireless Utility)
Deploying WiFi in Healthcare Facilities

Ceiling Tile Access Point Deployment Disadvantages

Hole in the ceiling tile

Gap in the ceiling

Gap in the ceiling

Gap in the ceiling
Infectious Control Risk Assessment (ICRA)

Lifting or removing ceiling tiles requires the installer to:

- Use Negative Air Pressure Enclosure (NAPE), or “tent off” the work area
- Use a HEPA air filter

These require more labor cost
Considerations for Deployment of the Wireless LANs

Healthcare WiFi Standards
Recommendations, Codes, and Compliances
BICSI-Medical Grade Wireless Utility Supplement

- Wireless Design Guide for the Healthcare Industry

- Wireless communications is a unique type of “Utility” in hospitals

- MGWU brings an engineered process-based approach to wireless network design and implementation

- Parking garages - Triage

- The implementation of a wireless infrastructure should not require costly and disruptive above ceiling change mgmt.
BICSI-Medical Grade Wireless Utility Supplement

• Implementation of Wireless

-Below ceiling installation of WiFi access points is a better alternative to above ceiling

-They should be installed in a cabinet flush with or below the ceiling, or wall mounted.

-MGWU can help prepare the hospital for the changing healthcare IT environment and future wireless technologies
The Benefits of Ceiling Tile Cabins

- Eliminates the cable being cinched between tile and grid
- Eliminates the hole in the tile to get the cable attached to the WAP
- WAP re-location made easy – preserving the original tile
- Aesthetics – A more professional installation
- Lockable doors that can help meet security requirements
Additional Benefits of a Ceiling Tile Cabinet

• Satisfies *National Electric Code* compliance
  (Plenum rated)
  - Non-plenum patch cords
  - Stow excess horizontal cable
  - Biscuit jacks

• Makes upgrades easier and faster

• Simplify Hospital ICRA procedures
Deploying WiFi in Healthcare Facilities

• **Hard Ceiling**

  - Simplifies deployment in hard ceilings
  - Trims can be exchanged with AP upgrades
  - Has enough room for cords, cables, biscuits
  - Back box helps simplify ICRA procedures

Before

After
• **TIA 1179** – Healthcare Facility Telecommunications Infrastructure Standard

- Once ceiling tiles are closed, adding or changing cabling could jeopardize infection control measures

- Restrictions on removing ceiling tiles impacts adds, moves and changes, and adds significant cost when the need arises to access the ceiling.

- It is recommended that the wireless environment be characterized prior to design and installation of cabling

- Policies and procedures to mitigate Airborne Infectious Disease
• HIPPA Compliance – *Physically Secure the Endpoints*
  
  This rule sets national standards for protecting the confidentiality, integrity, and availability of electronic protected health information.
Thank you for your time!