



# Cisco Ethernet Switches in the Healthcare Environment

Healthcare Technology Foundations

Business Challenge	Switching Benefit	Recommended Functionality
<p><b>Automate the process of connecting biomedical devices, IT systems, and guest devices within controlled zones on the hospital network.</b></p>	<p><b>BioMed Network Access Control</b></p> <ul style="list-style-type: none"> <li>▪ <b>Maintain network availability:</b> Provide ubiquitous wired and wireless coverage and a secure reliable backhaul for data from healthcare devices. Monitor device behavior, alerting the appropriate party of rules violations that could lead to either segregation or remediation of the device. Permit more mobility by bringing the device to the patient, rather than the reverse, improving patient care and overall efficiency.</li> <li>▪ <b>Simplify operations and medical device management:</b> Automate device assignments to controlled zones on the hospital network. Allow quick setup in other areas of the hospital as caregivers simply plug in the devices they need for more flexible facility use or in an emergency. Inventory and track assets to more effectively use a myriad of IP-connected endpoint devices.</li> <li>▪ <b>Secure access to information:</b> Automatically isolate and protect the biomedical devices from other host on the IP network to meet security standards and protect network performance. Manage devices on the network that are not part of the healthcare system, with the appropriate security and minimal impact on hospital resources. Provision certain biomedical devices for appropriate access capabilities and restrictions.</li> </ul>	<p><b>Maintain network availability:</b> The In-Service Software Upgrade (ISSU) enables medical devices to stay connected with minimal disruption even when upgrading the system. Nonstop Forwarding (NSF) and Stateful Switchover (SSO) help ensure the availability of critical healthcare applications even during system failures.</p> <p><b>Simplify medical device management:</b> Network virtualization to segment hospital operations. Network management tools and EnergyWise to monitor and regulate network and energy utilization of devices throughout the hospital infrastructure.</p> <p><b>Secure access to information:</b> Identification and authentication of users and devices with network segmentation and virtualization to converge IT in secure healthcare data.</p>
<p><b>Increase overall hospital security, reduce PCI compliance penalties, and support new business applications.</b></p>	<p><b>PCI for Healthcare</b></p> <ul style="list-style-type: none"> <li>▪ <b>Secure credit card data and patient confidentiality:</b> Build and maintain a secure network to protect cardholder data but also patient data. Maintain a vulnerability management program, implement strong access control measures, regularly monitor and test networks, and maintain information security policies.</li> <li>▪ <b>Simplify audit process and comply with PCI regulations:</b> Monitor and manage devices critical to your PCI network segment in real time 24 hours a day, 365 days a week. Identify anomalies, events, or trends that might adversely affect your network security. Use consolidated status reports that you can use with your stakeholders, such as third-party healthcare providers, insurance companies, and auditors.</li> </ul>	<p><b>Secure patient confidentiality:</b> Identification and authentication of users and devices with network segmentation and virtualization to converge IT in secure healthcare data.</p> <p><b>Simplify audit process and comply with PCI regulations:</b> Diagnostics and control tools use integrated wireless LAN, Power over Ethernet (PoE), and EnergyWise functionalities to continuously monitor and audit the network.</p>
<p><b>Scale healthcare mobility applications and services without compromising network security.</b></p>	<p><b>Secure Wireless</b></p> <ul style="list-style-type: none"> <li>▪ <b>Support wireless:</b> provide reliable coverage for mobile caregivers and hospital staff, who require wireless access throughout the hospital. Access the Medical-Grade Network not only from your offices, but most importantly at the point of care, when and where you need it. Entering patient information quickly at the point of care helps reduce the number of medical errors.</li> <li>▪ <b>Increase staff efficiency:</b> Improve the productivity of hospital staff by allowing them to make better-informed decisions on the spot. Having access to a patient's medical history or information at the point of care and being able to access the latest research can accelerate diagnostics and enable better-quality care.</li> <li>▪ <b>Support patient care and shorten response time:</b> Accelerate diagnostics by giving doctors and nurses faster access to test results and research information online. With the security provided by Cisco® Catalyst® switches, patients can be confident that their personal and credit information remains confidential. Hospitals can also improve the patient's experience by providing secure Internet access to patients and their guests without the expense of laying down long wires.</li> </ul>	<p><b>Support wireless:</b> Integrated wireless LAN controllers and enhanced PoE for 802.11n access points, enabling mobility and quality of service (QoS) for high-bandwidth applications, IP-based security systems, and device automation.</p> <p><b>Increase staff efficiency:</b> Diagnosis tools and response to events, wireless LAN connectivity, and PoE to support point-of-care mobility and accelerate patient diagnostics.</p> <p><b>Support patient care and shorten response time:</b> Wireless LAN connectivity, network virtualization, and security protocols enable faster access to test results, patient confidentiality, and guest services such as Internet access.</p>
<p><b>Protect patient privacy and patient security. Meet regulatory requirements, assess overall IT risks, and outline best practices.</b></p>	<p><b>Security Architecture</b></p> <ul style="list-style-type: none"> <li>▪ <b>Protect patient health Information:</b> Secure electronic health records (EHRs) on the network. Segment patient data from nonpatient network segments to provide tighter controls of the patient information.</li> <li>▪ <b>Secure patient data and confidentiality:</b> Support confidentiality and compliance regulations by preventing unauthorized users from accessing the network. Control who accesses the network and patient data.</li> </ul>	<p><b>Protect patient health information:</b> Network virtualization to segment hospital operations and segment patient data from non-patient-related network activity.</p> <p><b>Secure patient confidentiality:</b> Identification and authentication of users and devices with network segmentation and virtualization to converge IT in secure healthcare data.</p>



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Recommended Functionality	Switching Features			
	Cisco Catalyst 2960	Cisco Catalyst 3750-E	Cisco Catalyst 4500	Cisco Catalyst 6500
<b>Maintain network availability</b>		<ul style="list-style-type: none"> <li>Redundant Power System (2300W)</li> <li>Cisco StackWise® Plus for network availability with cross stack EtherChannel and Layer 3 NSF</li> <li>Flexlink for link redundancy with &lt;100ms convergence time</li> </ul>	<ul style="list-style-type: none"> <li>Dual power supply (4200W)</li> <li>Redundant supervisors</li> <li>In-Service Software Upgrade (ISSU)</li> <li>Reduced downtime with NSF and SSO</li> <li>Flexlink for link redundancy with &lt;100ms convergence time</li> </ul>	<ul style="list-style-type: none"> <li>Dual power supply (8700W)</li> <li>Redundant supervisors</li> <li>Reduced downtime with NSF and SSO</li> <li>Virtual Switching System (VSS)</li> </ul>
<b>Simplify medical device management</b>	<ul style="list-style-type: none"> <li>Network Access Control</li> <li>Auto SmartPorts to automatically detect and configure attached devices</li> <li>EnergyWise to manage the utilization of IP-enabled devices</li> <li>IP SLAs performance management</li> <li>Simple Network Management Protocol (SNMP) and MIBs</li> <li>Express setup using configuration wizard</li> <li>Integration with LAN management solution (LMS) and other network-level management systems</li> </ul>	<ul style="list-style-type: none"> <li>Network Access Control</li> <li>Auto SmartPorts to automatically detect and configure attached devices</li> <li>EnergyWise to manage the utilization of IP-enabled devices</li> <li>IP SLAs performance management</li> <li>SNMP and MIBs</li> <li>Express setup using configuration wizard</li> <li>Integration with LMS and other network-level management systems</li> <li>Embedded Event Manager (EEM) allows for optimized event response</li> </ul>	<ul style="list-style-type: none"> <li>Network Access Control</li> <li>SmartPorts to automatically configure attached devices</li> <li>EnergyWise to manage the utilization of IP-enabled devices</li> <li>IP SLA performance management</li> <li>SNMP and MIBs</li> <li>Diagnostic applications: Smart Call Home, Generic Online Diagnostics (GOLD).</li> <li>Integration with LMS and other network-level management systems</li> <li>EEM allows for optimized event response</li> </ul>	<ul style="list-style-type: none"> <li>Network Access Control</li> <li>SmartPorts to automatically configure attached devices</li> <li>EnergyWise* to manage the utilization of IP-enabled devices</li> <li>IP SLA performance management</li> <li>SNMP and MIBs</li> <li>Diagnostic applications: Smart Call Home, GOLD</li> <li>Integration with LAN management solution (LMS) and other network-level management systems</li> <li>Embedded Event Manager (EEM) allows for optimized event response</li> </ul>
<b>Secure access to information and patient confidentiality</b>	<ul style="list-style-type: none"> <li>Virtual LAN (VLAN)</li> <li>VPN Routing and Forwarding (VRF)</li> <li>VRF-Lite</li> <li>Port- and identity-based security</li> </ul>	<ul style="list-style-type: none"> <li>Network Virtualization and VLAN</li> <li>VRF</li> <li>VRF-Lite</li> <li>Network Admission Control (NAC) security framework, port- and identity-based security</li> </ul>	<ul style="list-style-type: none"> <li>Network Virtualization and VLAN</li> <li>VRF</li> <li>VRF-Lite</li> <li>NAC security framework, port- and identity-based security</li> </ul>	<ul style="list-style-type: none"> <li>Network Virtualization</li> <li>VLAN</li> <li>VPN Routing and Forwarding (VRF)</li> <li>VRF-Lite</li> <li>NAC security framework, port- and identity based security, VPN SPA</li> <li>IPsec Services Module</li> <li>Firewall Services Module</li> </ul>
<b>Simplify audit process and comply with PCI regulations</b>	<ul style="list-style-type: none"> <li>Integration with LMS and Network-level Management Systems (NMS)</li> </ul>	<ul style="list-style-type: none"> <li>Integration with LMS and NMS</li> <li>EEM to automate the behavior of network devices</li> </ul>	<ul style="list-style-type: none"> <li>Integration with LMS and NMS</li> <li>EEM to automate the behavior of network devices</li> <li>Virtualization to pool and secure network resources</li> </ul>	<ul style="list-style-type: none"> <li>Integration with LAN management solution (LMS) and Network-level Management Systems (NMS)</li> <li>EEM to automate the behavior of network devices</li> <li>Virtualization to pool and secure network resources</li> </ul>
<b>Support wireless and increase staff efficiency</b>	<ul style="list-style-type: none"> <li>QoS to prioritize specific applications and traffic types</li> </ul>	<ul style="list-style-type: none"> <li>QoS to prioritize specific applications and traffic types</li> <li>Integrated wireless LAN controller</li> </ul>	<ul style="list-style-type: none"> <li>QoS to prioritize specific applications and traffic types</li> <li>Integrated wireless data plane (available in next-generation supervisors)</li> </ul>	<ul style="list-style-type: none"> <li>QoS to prioritize specific applications and traffic types</li> <li>Wireless Services Module (WiSM) with two wireless controllers</li> <li>Integrated wireless LAN controller</li> </ul>
<b>Support patient care and shorten response time</b>	<ul style="list-style-type: none"> <li>Directly-attached access points powered with PoE and ePoE provide optimal network coverage for the patient</li> </ul>	<ul style="list-style-type: none"> <li>Directly-attached access points powered with PoE and ePoE provide optimal network coverage for the patient</li> </ul>	<ul style="list-style-type: none"> <li>Directly-attached access points powered with PoE, ePoE, and PoE+ provide optimal network coverage for the patient</li> <li>Dual Supervisor</li> <li>Reduced downtime with NSF and SSO</li> </ul>	<ul style="list-style-type: none"> <li>Directly-attached access points powered with PoE and ePoE provide optimal network coverage for the patient</li> <li>Dual Supervisor</li> <li>Reduced downtime with Nonstop Forwarding (NSF) and Stateful Switchover (SSO)</li> <li>Virtual Switching System for high availability and redundancy</li> <li>Sup-32-PISA for application recognition</li> </ul>
<b>Scale network architecture</b>	<ul style="list-style-type: none"> <li>Enhanced Power over Ethernet (ePoE)</li> </ul>	<ul style="list-style-type: none"> <li>ePoE</li> <li>Integrated wireless LAN controller</li> <li>StackWise allows multiple switches to be managed as a single network entity</li> </ul>	<ul style="list-style-type: none"> <li>Power over Ethernet + (PoE+)</li> <li>Integrated wireless data plane (available in next-generation supervisors)</li> </ul>	<ul style="list-style-type: none"> <li>ePoE</li> <li>Wireless Services Module (WiSM) with two wireless controllers</li> <li>Integrated wireless LAN controller</li> </ul>

\* EnergyWise will be available on the Cisco Catalyst 6500 in 2010.