MANAGEABILITY OF COMPUTERIZED MEDICAL EQUIPMENT

Intel® Active Management Technology Facilitates Remote Management

Hospitals today are being transformed into sophisticated medical facilities with computer-based medical equipment and intelligent, connected medical devices. Healthcare facilities are becoming digitized and networked, with a wide array of high-tech medical devices supplying data to a centralized electronic medical record (EMR).

Medical equipment such as diagnostic equipment, laboratory/analytical equipment, drug dispensing carts, computerized physiotherapy, patient infotainment terminals, multi-parameter patient monitoring, endoscopy and Computers-on-Wheels (CoWs) all leverage PC-based architectures and feed data into the EMR, which acts as both a permanent repository for health information and a system that can be accessed instantly by doctors to assist with clinical decisions.

As healthcare providers deploy more technology into hospital settings, remote management of these devices becomes critically important in helping to contain costs, reduce complexity and increase the quality of healthcare. Intel® remote management technologies, already enabled in management tools in desktop PCs, servers and some tablet PCs, help deliver these benefits across the healthcare enterprise.

These technologies are part of Intel® vPro™ technology with Intel® Active Management Technology (Intel® AMT) and they enable Intel® chipsets to access and control an embedded system even if they are powered off (called out of band management) or in need of repair. This hardware-based feature expands and enhances the ability of healthcare IT to remotely monitor, maintain and repair such medical devices.

Intel AMT-enabled PC platforms improve overall device manageability. Intel works closely with healthcare providers and equipment manufacturers worldwide to effectively integrate these advances into the healthcare information environment. Multiple medical devices installed at different locations can be managed from a central location using standard communication protocols. Minimizing the need to send out repair

change BIOS settings or reload a driver or OS, whether or not the system is running.
- Provides a reliable mechanism to turn systems on/off, if needed, to save power.
- Allows IT staff to quickly deploy security patches, remotely unlock encrypted drivers and manage data security settings.
- Gives IT staff complete control over a system with keyboard-video-mouse (KVM) remote control.
- Allows remote hardware and software asset tracking.
- Simplify management from a centralized console providing detailed information and allowing the ability to connect and configure remotely.

All in all, POC_Link helps an IT team simplify and streamline actions such as centralized deployment configurations, low-level virus detection and repair, improved uptime, automated power management, and hands-off software distribution and updates.

Simplifying the Manageability of Point-of-Care Devices

The manageability of intelligent distributed embedded systems used in "mission critical" applications is a critical requirement. Point-of-Care terminals are deployed throughout a hospital, such as the operating room (OR), intensive care unit (ICU) and laboratory. They are typically connected to the hospital information system (HIS) network and are essential in ensuring that all information gathered is made available in real-time to the attending healthcare practitioners. Point-of-Care terminals can be either wall-mounted or attached to a mobile cart (or onto an anesthesia device), making remote management even more important.

Advantech's POC_link helps customers maximize their return on investment using technology that provides greater flexibility and enhanced productivity. Apart from utilizing POC_Link, IT staff also has the option of developing their own manageability software. For these kinds of users, Advantech provides WMI and SUSI (Secure & Unified Smart Interface) manageability SDKs. Advantech's WMI and SUSI SDKs help reduce development time and cost, facilitating the needs of customers who want a real-time centralized monitoring and managing system. The SDKs provide a set of user-friendly, intelligent and integrated interfaces, speeding development, enhancing security and offering add-on value for Advantech platforms.

Advantech Digital Healthcare

Advantech is one of the leading suppliers of medical-certified computing systems and services for the medical market. The company has worked with all the prominent medical device OEMs and system integrators and their medical-grade computing systems are essential in helping hospitals provide real-time care in operating rooms, ICUs, exam rooms and wards. Advantech healthcare solutions allow healthcare practitioners to connect to hospital information systems (HIS) at the bedside to assist in patient consultations and treatment. They provide numerous medical systems technologies, such as:
- Point-of-Care Terminals
- Patient Infotainment Terminals
- Mini PCs and Box PCs
- Mobile Clinical Assistants
- Medical Tablets
- Single Board Computers
- Computer on Modules
- Diagnostic displays

Advantech's portfolio includes a diverse range of touchscreen-equipped POC terminals built specifically for the medical environment with a choice of configurations and screen sizes ranging from 10 to 22 inches diagonally.

For seamless integration, Advantech provides an application-ready platform software suite, which helps medical IT departments, application developers and system integrators achieve rapid application development, easy system deployment and smart system management.

For more information about Advantech healthcare solutions, visit www.advantech.com/healthcare. For more information about Intel® healthcare solutions, visit www.intel.com/go/medical. Conor Clancy is a Market Development Manager with Intel's Intelligent Systems Group focusing on the medical segment and can be contacted directly for assistance on medical-related designs: conor.a.clancy@intel.com. ■

teams by diagnosing issues remotely reduces operational and maintenance costs, increasing device utilization by minimizing downtime. Intel AMT also supports a feature called KVM redirection over IP permitting the keyboard, video and mouse of an IT console to control and display the graphical user interface of a device in the field equipped with an Intel vPro technology-enabled platform with integrated Intel® Graphics Technology.

Intel® Active Management Technology: Discover, Heal and Protect

The Intel AMT value proposition for desktop PCs is often summarized as: "discover, heal, protect." Advanced manageability features allow IT staff to query, restore, upgrade, and protect devices remotely, even when they are powered off or experiencing software failures. Remote manageability capabilities are only available in Intel® Core™ vPro™ processors.

- Discover embedded devices, running software, operational status and whether failures can be dealt with remotely.
- Heal to quickly recover from failures. Many on-site trouble tickets are attributable issues that can be resolved through Intel AMT remote manageability.
- Protect with the convergence of manageability and security capabilities. Intel AMT has the ability to continuously check for the presence of security software agents, check for malicious packets, block ports used by suspicious software to disable access to the network, and isolate a system in case it is compromised.

Intel's embedded product line offers a wide range of solutions, such as Intel Core vPro processors, that support Intel AMT OOB solutions. Intel AMT is built into select Intel chipsets and employs a silicon resident management mechanism. This circuitry establishes a new communications channel, using an "out-of-band" link that operates independently of the "in-band" channel of the computing system and provides persistent connectivity. The Intel AMT out-of-band link employs a dedicated manageability engine (ME) that enables control over non-functioning systems. Other Intel AMT elements include a small amount of memory residing in the FLASH device and a firewall with filters supported in the Intel chipset. When the system is functioning properly, the Intel® processor communicates with the Intel® Management Engine (Intel® ME) using manageability service software it runs locally. In contrast, traditional remote management consoles use standard in-band networking, which utilizes the device's operating system, CPU and network drivers. When the network is the problem, or the end system fails after a power surge, or the operating system crashes, not much can be done by in-band remote access software as it has the drawback of relying on the continued operation of many equipment components.

POC-W211 Medical Point of Care Terminal

Advantech is a leader in providing a wide range of certified medical computing systems and services. The company has recently released the POC-W211 Point-of-Care terminal, a medical-grade device with a versatile array of options that fulfill a variety of medical usage cases. These systems and services are being employed in a diverse range of applications ranging from data acquisition to vital signs monitoring devices, Patient Data Management Systems (PDMS) and visualization (X-ray, endoscopy), and they play a critical role in the provision of medical care to patients. These devices are ideal in helping to bring EMR (Electronic Medical Records), PACS (Picture Archiving and Communication System) and CPOE (Computerized Physician Order Entry) to the point-of-care, they are UL60601-1/ EN60601-1 3rd edition compliant, and CE, CCC and FCC Class B-certified. The units are also IP65-certified for dust and water resistance, and easy to clean and maintain using disinfectant cleaners to help prevent bacterial contamination. The POC-W211 runs on the 2.2 GHz Intel® Core™ i7-2655LE processor and chipset, and it is capable of displaying crystal
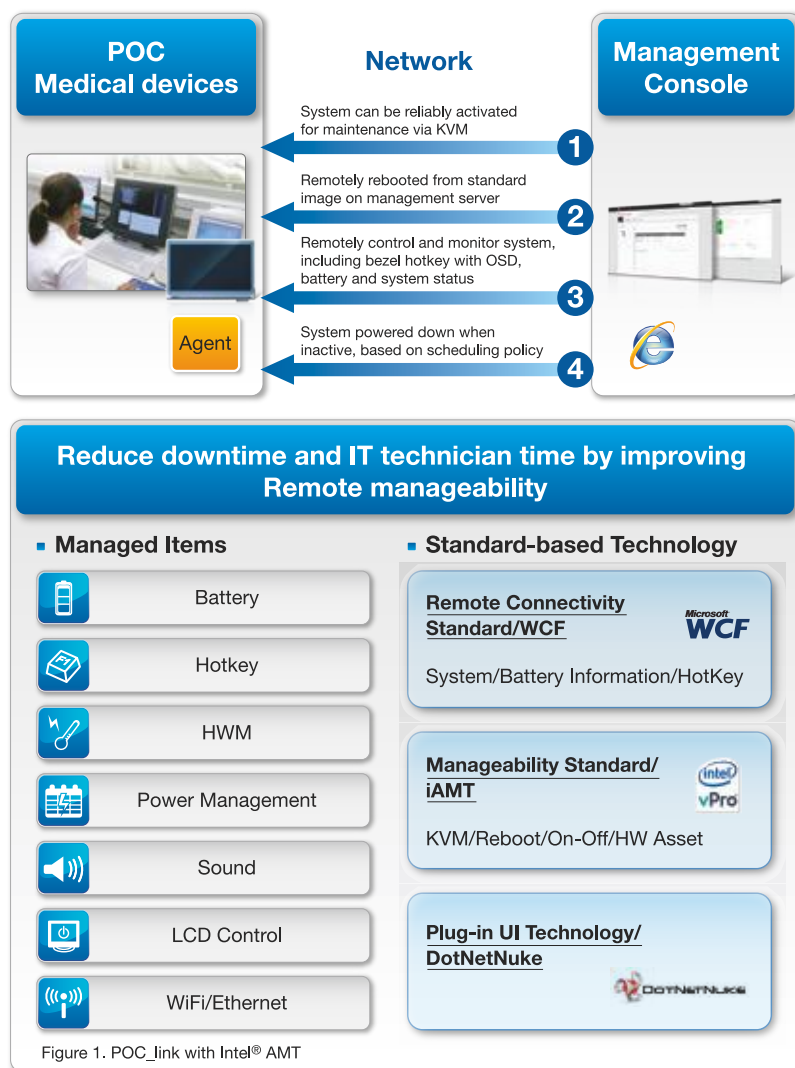
clear images on its 21.5" wide-screen display. Additional performance can be obtained by enabling Intel® Turbo Boost Technology, which adjusts processor speed for more performance when you need it.

The POC-W211, housed in a slim 6.5 cm casing, weighs 7 kg, accommodates a 5-wire resistive touchscreen for ease of use, and supports many optional features, such as Bluetooth, RFID, WLAN and more. Fanless operation makes it an ideal computerized solution for image-intense medical applications in operating arenas, at bedside, nursing stations or other point-of-care locations within the medical facility.

POC-W211 and Intel® Active Management Technology (Intel® AMT)

As the sheer number and complexity of devices expands, the big challenge facing hospital IT staff is how to integrate, manage and secure these devices. Point-of-Care terminals are typically scattered in many different locations throughout a hospital. Advantech is now offering advanced management capabilities based on Intel AMT, one of the ingredients of Intel vPro technology available in the 2nd generation Intel® Core™ i5 and Intel® Core™ i7 processors, through its POC_Link software suite. The remote computer management software is based on client/server architecture (see Figure 1). It provides POC (Point-of-Care) devices with remote monitoring and management capabilities for critical managed items, including real-time battery capacity, system health, LCD, power and network status updates. POC_Link integrates Intel AMT technology and POC management functions to provide a single management console. It allows staff to manage, monitor, and maintain distributed POC terminals remotely irrespective of where they are located within the hospital. With POC_Link, hospital staff can administer devices more efficiently and provide higher Point-of-Care quality.

POC Medical devices — **Network** — **Management Console**

System can be reliably activated for maintenance via KVM **1**

Remotely rebooted from standard image on management server **2**

Remotely control and monitor system, including bezel hotkey with OSD, battery and system status **3**

Agent

System powered down when inactive, based on scheduling policy **4**

Reduce downtime and IT technician time by improving Remote manageability

Managed Items

- Battery
- Hotkey
- HWM
- Power Management
- Sound
- LCD Control
- WiFi/Ethernet

Standard-based Technology

Remote Connectivity Standard/WCF — Microsoft WCF
System/Battery Information/HotKey

Manageability Standard/iAMT — intel vPro
KVM/Reboot/On-Off/HW Asset

Plug-in UI Technology/DotNetNuke — DOTNETNUKE

Figure 1. POC_link with Intel® AMT

Main Features of POC_Link

POC_Link offers the following features:

- Web-based structure: modularized, OS-log-off data transfer, online service/update.
- Monitor system health: CPU temperature, voltage, battery capacity and remaining time, and network status.
- Discover system information: Hard disk drive (HDD) capacity, BIOS information and system information.
- Manage platform: LCD brightness, power management, volume and hot key control.
- Picture quality evaluation.
- Intel AMT 7.0 capable, which:
  - Enables IT to remotely troubleshoot and repair systems even when they don't boot. Using Intel AMT it is possible to remotely boot a device from a networked drive, called a golden disk, with known good software. IT staff can also remotely