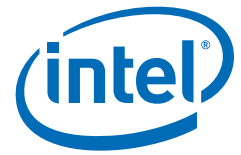


Technology Brief

Intel® Active Management Technology

Embedded Computing



Decreasing IT Support Costs for Devices

Improved remote management reduces service calls, average power consumption and staff requirements for software updates and asset tracking

IT organizations facing an escalation of networked embedded devices are turning to remote management to help them contain rising support costs. Remote management facilitates the repair of various system problems over the network, thus reducing the number of costly onsite repair visits. Providing a significant remote management breakthrough, Intel® Active Management Technology¹ (Intel® AMT) enables IT professionals to query, fix and secure devices, even when they're powered off or have software issues.

When onsite visits are required, Intel AMT helps identify failed components in advance, which enables technicians to arrive with the appropriate spares and fix systems faster. Protecting corporate networks, remote management solutions with Intel AMT can download the latest virus signatures to devices, powered on or off, or quarantine infected devices to prevent viruses from spreading. Intel AMT also helps reduce utility costs with a remote on/off switching option, which allows companies to shut down devices, such as point of sale (POS) terminals in stores, after business closes. Based on a recent report by Global Retail Insights, an IDC Company, retailers can see total cost of ownership (TCO) reductions of \$401 (USD)² annually per POS terminal by using Intel® Core™2 Duo processors and Intel AMT.

Advancing Remote Management

Traditionally, remote management consoles communicated with devices using their standard networking capability, called "In-Band" link, which includes the device's operating system (OS), CPU and network drivers. In contrast, Intel AMT circuitry establishes a new communications channel, called "Out-of-Band" link, that operates independently of the computing system and provides persistent connectivity. This Out-of-Band link, shown in Figure 1, enables management consoles to communicate with non-functioning devices.

- **In-Band Link:** The system uses the same networking functionality (e.g., OS, hard disk drive, CPU, protocol stacks) for both LAN and remote management communications.
- **Out-of-Band Link:** Using Intel AMT, the system implements a dedicated communications link for remote management that does not rely on the system's standard networking functionality.

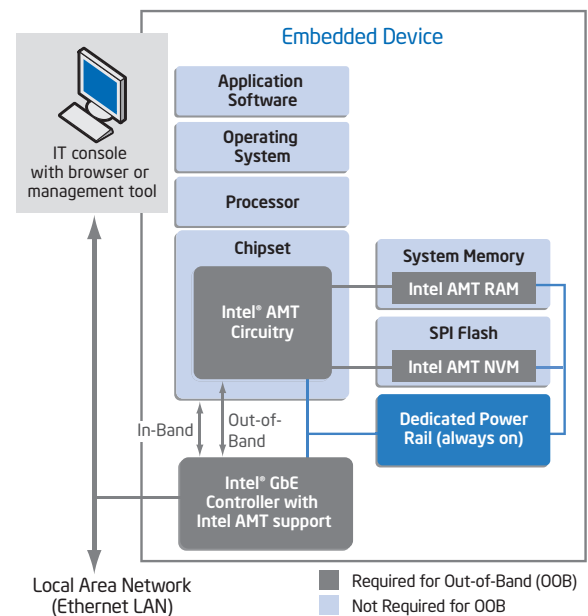


Figure 1. Intel® Active Management Technology Components

When equipment fails, the In-Band approach has the drawback of relying on the continued operation of many equipment components, significantly limiting the types of problems or failures that can be fixed remotely. If a malicious virus attacks the OS or the IP software stack, the In-Band link may not work and dispatching a technician may be the only option.

Out-of-Band management provides an alternative connection to the equipment, which operates independently of major system components. Using Intel AMT, it's possible to diagnose and repair a wide assortment of system problems, as long as the equipment is connected to a power outlet and the LAN. With Out-of-Band management, IT can perform many support tasks, as shown in Table 1, when systems are switched off or hung, which cuts down on costly onsite service calls and gets systems back online faster. The Out-of-Band link is not proprietary and securely interfaces to a standard local area network (LAN).

Capabilities	Results
Update Virus Protection	Automatically download new security policies through a secure link, without end-user intervention.
Run Inventory Reports	Remotely read system configuration data from non-volatile memory, even if the system is switched off.
Fix Hung Systems	Restore systems by cycling power, reloading software or booting from a "gold" hard drive on the network.
Reduce Power Consumption	Save power by powering down systems during off hours using the remote on/off switching option.
Check Security Software Status	Monitor for the presence of software agents, such as anti-virus and firewall applications, using Agent Presence feature.
Protect Against Infected Devices	Quarantine at-risk systems by cutting off their In-Band network connection, which isolates the virus.
Define and Enforce Security Policies	Apply a set of filters and actions to incoming/outgoing network packets using System Defense feature.

Table 1. Intel® Active Management Technology Capabilities and Results

Cutting IT Support Costs

By employing Intel AMT-based remote management solutions, IT organizations can reduce cost and increase network security without sending a technician to service the device. They can repair a wide assortment of system defects, track inventory and ensure devices are running the latest security software.

Reduce Onsite Repair Costs

When a system doesn't boot due to corrupted software (e.g., OS or critical applications), the usual remedy is to send a technician onsite to reload the software image. Using Intel AMT, it's possible to remotely boot a device from a hard disk drive on the network with known good software, which greatly aids troubleshooting. IT can also remotely change BIOS configuration settings, load new drivers or load a new operating system, whether or not the system is running.

Track Inventory Without Physical Interaction

For many businesses, it's a struggle to perform a fixed asset inventory, especially on equipment that's turned-off or non-functioning, which makes them resort to physical methods. Eliminating human intervention, Intel AMT enables management systems to generate a comprehensive list of hardware and software components for any device that's plugged into the network and an electric socket. This capability also enables IT departments to monitor the software, by version, warranty and license, of every device on the network.

Platform Components	Required Capability
Intel® Processor	Intel® Active Management Technology (Intel® AMT)-enabled, which includes the Intel® Core™2 Duo processor P8400, T9400, SL9400, SU9300, and SP9300.
Intel® Chipset	Intel AMT-enabled
Intel® GbE Ethernet Controller	Intel AMT-enabled
Management Software	Intel AMT-enabled. Available from software vendors or can be written by developers.
Client BIOS	Intel AMT-enabled

Table 2. Required Intel® Active Management Technology Components

Keep System Virus Signatures Up-to-Date

Today, almost every embedded device is connected to a network and needs to be protected by the most up-to-date security software. With Intel AMT, IT departments can ensure each device connected to the network has the latest virus signatures, without user assistance or the device powered-on. If a contractor using an Intel AMT-enabled system connects to the network, but has out-of-date security profiles, the remote management system can quarantine the device and keep it from possibly spreading any viruses. Once the system is updated with the latest virus definitions, it is allowed to reconnect to the network.

Lower Utility Costs

Although most companies could power down some systems at the close of business to save power, many don't because IT departments typically send software and data updates during off hours. A solution is to configure remote management software, based on Intel AMT, to turn systems off after work hours and turn them back on when IT requires access. This feature, combined with the power-efficiency of Intel® processors, can generate considerable cost savings and help protect the environment.

Deploying Intel® Active Management Technology

Intel AMT is enabled by a number of hardware and software components, which are listed in Table 2, including Intel AMT-enabled Intel processors, chipsets and Ethernet controller. The software running on the management server and client BIOS software must be Intel AMT-enabled. Management software support is available through an open source Intel® software development kit (SDK). For information about Intel AMT on Linux,* visit www.openamrt.org.

For more information on Intel Active Management Technology, visit www.intel.com/technology/advanced_comm.

Additional information about Intel® embedded products can be found at www.intel.com/products/embedded/index.htm.

¹ Intel® Active Management Technology (Intel® AMT) requires the computer system to have an Intel AMT-enabled chipset, network hardware and software, as well as connection with a power source and a corporate network connection. Setup requires configuration by the purchaser and may require scripting with the management console or further integration into existing security frameworks to enable certain functionality. It may also require modifications of implementation of new business processes. With regard to notebooks, Intel AMT may not be available or certain capabilities may be limited over a host OS-based VPN or when connecting wirelessly, on battery power, sleeping, hibernating or powered off. For more information, see www.intel.com/technology/platform-technology/intel-amt/.

² Source: Estimates Based on a executive brief by Global Retail Insights, an IDC Company, titled "Advanced CPUs: The Impact on TCO Evaluations of Retail Store IT Investments", which can be downloaded from http://download.intel.com/design/intarch/platforms/iaclient/Intel_TCO_Executive_Brief_Final.pdf.

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