Intel® Active Management Technology

New capabilities for improving IT platform management efficiency.

A major barrier to greater IT efficiency has been removed. Now, corporate IT departments can remotely discover, heal and protect networked computing assets, regardless of system state. Even with a crashed hard drive or locked operating system, an IT technician can still access the platform for remote asset, inventory, and software management or remote diagnostics and recovery procedures.

Intel® Active Management Technology (Intel® AMT) provides capabilities that make new levels of IT management possible. This platform-resident hardware and firmware solution uses out-of-band (OOB) communication for platform access regardless of the state of the operating system (OS) or platform power. Essentially, the only requirements are that the platform be corporate network connected and have standby power. Even when a platform is powered down or has a non-operational OS, Intel AMT maintains access to and management of the platform. This "any platform state" access gives corporate IT departments unprecedented power to remotely discover, heal and protect computing assets. The results are more efficient computing assets management and significantly reduced IT operating costs.

Solving Previously Unsolvable IT Challenges

Extensive surveys of numerous IT shops—including the Intel IT organization—laid the groundwork for defining Intel AMT. Three of the top IT needs revealed by these surveys are better asset management, reduced downtime and minimized desk-side visits. Intel design teams determined that these issues are best addressed through platform architectural enhancements, resulting in the following features for supporting the discover, heal and protect process.

- **OOB System Management**—Allows remote management of platforms independent of the OS and regardless of power on/off state or OS state.
- **Proactive Alerting**—Decreases downtime and minimizes time-to-repair by automatically alerting IT to platform problems.
- **Nonvolatile Storage**—Holds asset ID and inventory information and sustains it through power outages and system rebuilds.
- **Tamper-Resistant Agents**—Prevents users from removing critical inventory, remote-control and virus-protection agents.

Intel AMT implements the above features as new hardware and firmware capabilities on the platform's motherboard. Additionally, Intel AMT uses the platform's auxiliary power to keep the features active even when the platform is turned off. This always-available state adds to the power of these features in providing new IT management capabilities to discover, heal and protect computing assets. These new features and capabilities are explored further in the following sections.

Remotely Discover Computing Assets in Any State

Accurate platform, software and hardware inventories are necessary for regulatory compliance as well as for accurately managing maintenance contracts and software licenses. While in-band tools are available today for remote inventory, they miss platforms that are powered down, have been tampered with, or have an OS problem. As a result, lengthy and expensive manual inventory is often needed to ensure accuracy. By contrast, Intel AMT eliminates manual inventory costs by using OOB management tools and tamper-resistant agents in nonvolatile memory to discover all network-connected computing assets.

Figure 1 illustrates the Intel AMT discover process. Here a third-party or independent software vendor's (ISV) management application polls network-connected PCs to discover inventory. Because polling occurs through OOB communication, even powered-down and OS-disabled platforms are discovered. Additionally, because of the tamper-resistant agents and nonvolatile memory features, a full and accurate inventory of the platform's hardware and software is always available through Intel AMT.

Remotely Heal Computing Assets

In the past, an inoperable OS, corrupted application, or crashed hard drive invariably required at least one or two desk-side visits to fix the problem. The proactive alerting and remote-boot capabilities of Intel AMT can reduce the number of desk-side visits and even eliminate them in some cases by remotely healing the platform problem. Figure 2 illustrates the process of remotely healing computing assets.

In the first step shown in Figure 2, a problem occurs in one of the platforms and the Intel AMT proactive alerting feature notifies the IT management console. Depending on the type of problem alert, IT can remotely reboot the platform to an IT diagnostics platform if necessary (step 2 in Figure 2). Remote reboot would be necessary, for example, when the platform's OS becomes unstable or locks up or if there is a hard-drive failure. Even with the OS down or a drive failure, Intel AMT proactive alerts and remote reboot still function because they occur using OOB communication.

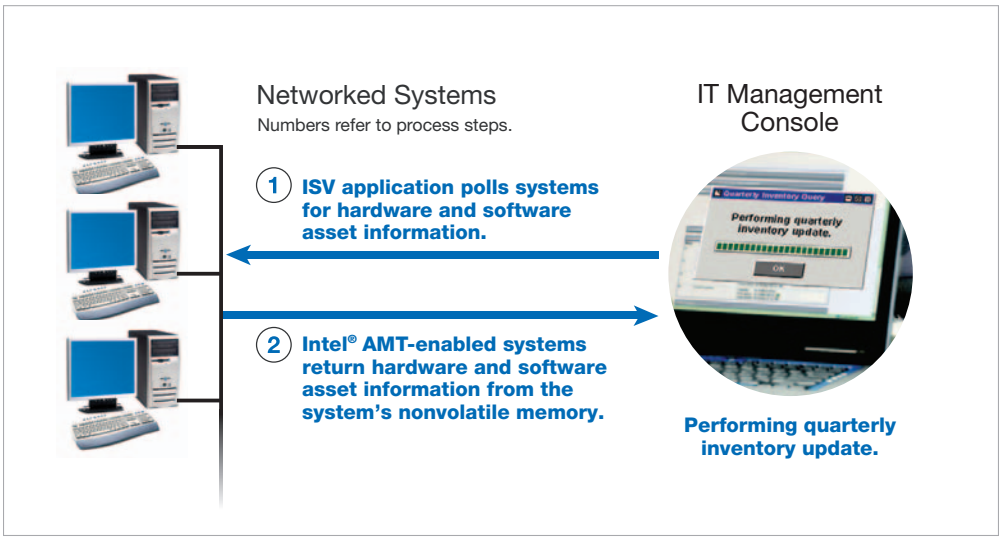

Figure 1. Discovering computing assets.

Intel® AMT's OOB communications allows it to poll systems, even if they are powered down or have an inoperable OS, to obtain hardware and software inventory information from each system's nonvolatile memory.

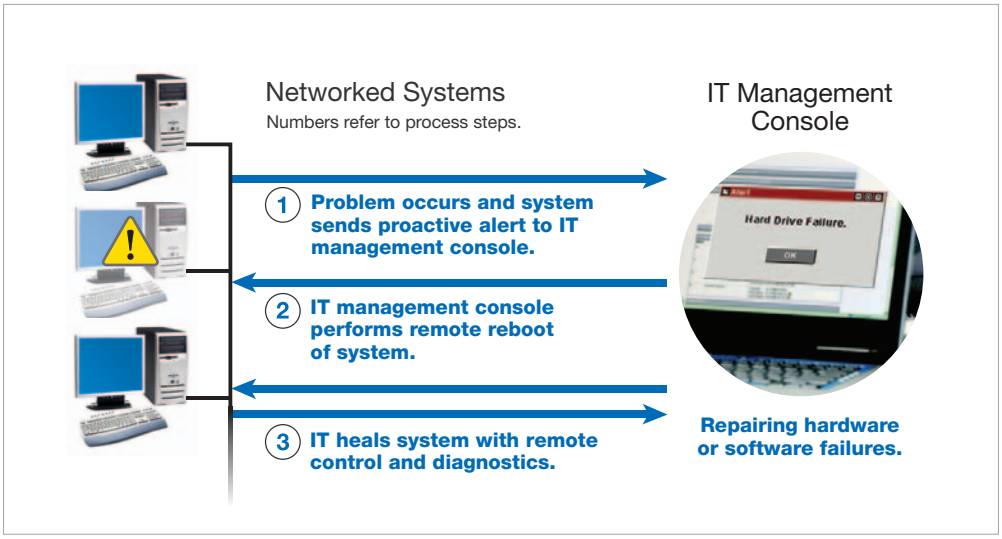

Figure 2. Healing computing assets.

Proactive alerting notifies IT of a system problem, even when the system is down, allowing IT to respond by remotely rebooting the system to a diagnostic platform for problem resolution by either down-the-wire repair in the case of software problems or by dispatching a technician with the appropriate replacement part in the case of hardware problems.

Once IT has control of the platform using remote reboot, third-party diagnostics can be applied to diagnose the problem and define a repair solution (step 3 in Figure 2). If it is a software problem, such as a corrupt OS or application, IT can heal the platform down the wire (DTW) by remotely reloading clean software from IT inventory onto the platform. Such DTW solutions eliminate a desk-side visit by a technician.

If the failure is diagnosed as a hardware problem, such as a hard disk drive, Intel AMT can access inventory information in the platform's nonvolatile memory to determine the disk drive make, model and warranty status. IT can then issue a work order telling the field technician precisely which disk drive to take to desk-side for replacement. This eliminates at least one desk-side visit since, in the past, a technician would have made a desk-side visit to diagnose the hardware problem then would have to return again with the correct hardware item for the repair.

Remotely healing assets using Intel AMT provides faster time-to-repair and significantly reduces desk-side visits, thus increasing IT efficiency and reducing maintenance costs.

Remotely Protect Computing Assets

It is important to protect computing assets and maintain corporate productivity by ensuring that each platform has the latest IT-approved software versions installed. This minimizes file and operating incompatibilities that can occur when different departments or groups use differing application software versions. In particular, it is vital to protect against virus attacks by ensuring that anti-virus software and virus-definition files are kept up to date on all platforms.

While in-band tools are available for identifying and updating anti-virus software, their OS-level agents can be accidentally removed or overwritten. Additionally, in-band tools cannot

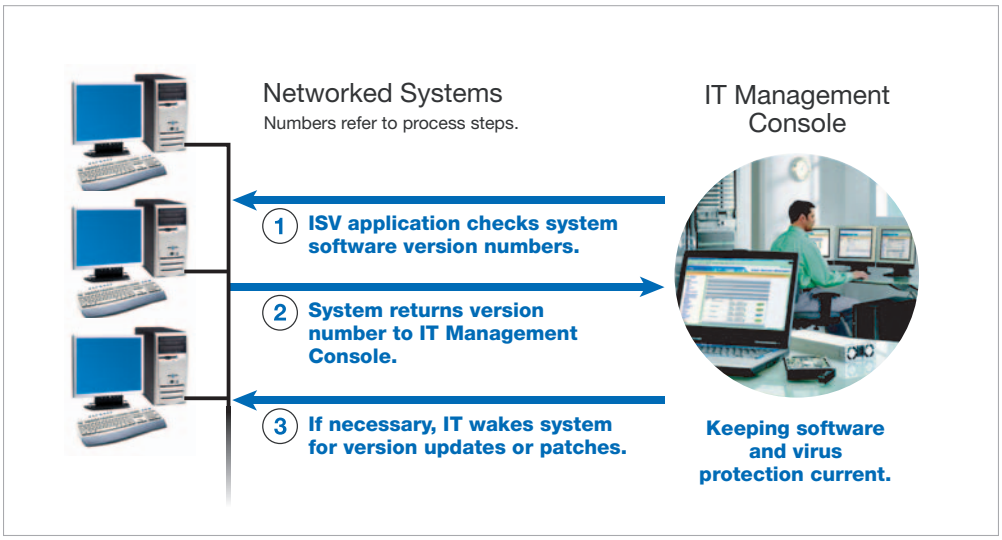

Figure 3. Protecting computing assets.

Through OOB communication, each system's software version numbers are checked and, if necessary, system software and virus protection are remotely updated with the most recent patches and virus definitions.

work if the platform is powered down or its operating system is not available.

The out-of-band capability of Intel AMT allows remote maintenance of anti-virus software, regardless of platform state. This is shown in Figure 3, where an ISV application operating through Intel AMT checks platform software version numbers. Upon finding an out-of-date version number, IT can wake the platform for off-hours version updates or patches.

Complete software update and patching is done remotely through Intel AMT, eliminating desk-side visits and ensuring that enterprise protection is current across all Intel AMT-enabled platforms.

This capability to protect computing assets, along with the remote discover and remote heal capabilities, are supported by a uniform network-connected application-programming interface (API). An Intel AMT-provided API allows ISV integration of additional remote management and diagnostics tools with Intel AMT capabilities. Intel AMT and its uniform API are also a part of a major cross-platform management initiative being introduced by Intel.

Major ISVs Support Intel® AMT

Recognizing the advantages and benefits of Intel AMT for improving IT platform management efficiency, major ISVs around the world are adding support for Intel AMT features and usages to their products. These ISVs include Altiris, BMC Software, Check Point Software, Computer Associates, LANDesk Software, Novell, StarSoftComm, Symantec and Trend Micro. They provide leading-edge solutions in the areas of asset management, remote diagnosis/remote repair and network security. Their enablement activities on Intel AMT will allow IT managers to realize efficiencies and cost savings not possible with previous generation hardware and software solutions.

Intel® Cross-Platform Manageability Program

The Intel® Cross-Platform Manageability Program (Intel® CPMP) is an initiative for designing and identifying common and consistent management capabilities, interfaces and protocols across all Intel platforms—from cell phones to servers. Intel is enabling this by driving standards, products and technologies within the broad Intel ecosystem. Intel, in addition to our broad ecosystem, will enable integrated cross-platform functionality to help simplify implementation and management of the enterprise to increase business agility and reduce total cost of ownership (TCO). Intel Active Management Technology is the first implementation of Intel CPMP.

For More Information

To learn more about Intel Active Management Technology and the Intel Cross-Platform Manageability Program, visit **www.intel.com/go/iamt**

Printed in USA/0205/TS/PMS/PP/5K

Order Number: 303749-004US