

App Note: TCIS - vPro AMT Functionality App Number: 039 Related TSI Products: OPS-TCIS-PS

Intel VPro Active Management Technology (AMT)

1. Overview:

Intel Active Management Technology is a feature of Intel Core processors with Intel vPro technology. Intel AMT uses integrated platform capabilities and popular third-party management and security applications, to allow IT or managed service providers to better discover, repair, and help protect their networked computing assets.

Intel Active Management Technology (AMT) is part of the Intel vPro technology offering. Platforms equipped with Intel AMT can be managed remotely, even if the operating system is unavailable or the system is turned off. Intel AMT-enabled systems have special out of band network access through the Intel Wired network connection allowing remote platform management applications secure access as long as the platform is connected to line power and to a network. Intel AMT operates independently of the platform processor and operating system.

Independent software vendors (ISVs) can build applications that take advantage of Intel AMT features using the Intel AMT SDK which includes the Intel AMT High Level API. The SDK also contains the Intel vPro Platform Solution Manager, which is a management console that was built from the Intel AMT APIs.

Intel AMT uses a number of elements in the Intel vPro platform architecture, most notably the Intel Management Engine, part of the firmware supplied by the system manufacturer with the BIOS. The firmware uses a small portion of system RAM, which is why slot 0 must be populated and powered on for the firmware to run. It also has its own Flash storage that holds the configuration settings among other information.

2. BIOS Support

Within the BIOS the user can see which version of the Management Engine (ME) is installed. Our current version is 11.0.25.3001. By default the ME is enabled but not provisioned. If the system is not provisioned, ME can be disabled in the BIOS.





3. VPro Configuration

a. Factory Default

By default the AMT functionality is delivered "Unprovisioned". In this state the system is inaccessible via AMT.

b. Provisioning

The process of provisioning the system is covered in detail in the "<u>Intel Management Engine Bios</u> <u>Extension (MEBX) user guide</u>". The minimum required steps are to set the administrative password and enable the network interface.

To bring up the MEBX menu the user presses "Control + P" during the power on sequence. The first step is to change the password from the default "admin" to the password to be actually used for access.

	MAIN MENU
HEBx Login Intel(R) ME General Settings Intel(R) AMT Configuration MEBx Exit	

Once a new password is entered the network access can be enabled under the AMT Configuration menu. There are several additional settings that an administrator may want to set up but the defaults are sufficient for our example purposes.

	INTEL (R) AMT CONFIGURATION
Manageability Feature Selection SOL/IDER/KVM	<enabled></enabled>
Password Policy Network Setup Activate Network Access	<angtime></angtime>
Unconfigure Network Access > Remote Setup And Configuration	<full unprovision=""></full>



4. Remote Management Example

To test or demonstrate AMT Intel provides the "<u>vPro Platform Solution Manager</u>" software. With this free software an administrator can remotely manage a vPro-AMT enabled device.

٩	Intel(R) vPro Platform Solution Manager					- 🗆 🗙	
intel® vPro™ Pl Solution Manag	atform Jer						G Settings @
Devices 💽 🖈	10.0.7.3	32					
10.0.7.32	Disconn	ect 💌			Firmwa	e Version: 11.0.25.3001	
	Intel® AMT	MISC					
	Intel Active Mana	igement Technolo	ogy.				KVM Remote Control
			(\$	1		Settings 💌
	Access Control List	Agent Presence	Alarm Clock	Asset Inventory	Event Log	KVM Remote Control	KVM Session Disconnect
			2	.	Ve		Connect
	Power Management	Quick Launcher	Serial Over Lan	Storage Redirection	VNC® Plus KVM Viewer		¢
KVM Status: ConnectionClosed: Erro	r: 0x80862700: Session	inactivity timeout	occurred				

The first step, once the management software is installed, is to determine the IP address of the system to be controlled. One way to accomplish that is to examine the network connection status of the interface in use.

Network Connection Detai	ls	×
Network Connection Details:		
Property	Value	
Connection-specific DNS	hq.technovare.com	1
Description	Intel(R) Ethernet Connection I219-LN	1
Physical Address	00-F1-F3-B2-98-2C	
DHCP Enabled	Yes	
IPv4 Address	10.0.7.32	
IPv4 Subnet Mask	255.255.255.0	
Lease Obtained	Thursday, July 20, 2017 10:03:29 PM	
Lease Expires	Friday, July 21, 2017 10:03:29 PM	
IPv4 Default Gateway	10.0.7.254	
IPv4 DHCP Server	10.0.7.254	
IPv4 DNS Servers	10.0.7.238	
	10.0.7.237	
	10.0.7.236	
IPv4 WINS Servers	10.0.7.237	
	10.0.7.238	
NetBIOS over Tcpip Enab	Yes	
Link-local IPv6 Address	fe80::b9a6:3c:f71f:5032%6	
IPv6 Default Gateway		
IPv6 DNS Server		
	Close	;



The system can then be added to the list of devices to be managed in the Platform Solution Manager using the default user name of admin and the password previously set in the MEBX configuration step.

1		Intel(R) vPro Platform Solution Manager			
Market Revealed Solution	/Pro™ Pla n Manage	atform er			
Devices	÷ +	10.0.7.32			
10.0.7.32		😵 Add a new device 🗙			
		General Host/IP: 10.0.7.32 Credentials User Name: admin Password: ••••••••••••••••••••••••••••••••••••	E Intel© af m		

Once added the device can be accessed remotely. Below is an example of the "Asset Inventory" function.





Remote control functionality is provided by the "VNC Plus" KVM viewer application that is installed along with the Platform Solution Manager. The freely downloaded version has a 60 day evaluation period.

Netw -> 🔹 🛧 👻 > Network Connections ✓ U Search Network Connections P Organize * Disable this network device Diagnose this connection View status of this connection 🔹 💱 🔹 🔟 📀 Rename this connection Bluetooth Network Connection I-Fi 🕳 Ethernet Status at connected Not connected × Bluetooth Device (Personal Are X (R) Dual Band Wireless-AC 31... DT DNG Network Connection Details Network Connection Details: Property Value
 Property
 Value

 Connection-specific DNS
 h_l technovare.com

 Description
 Intel(R) Ethernet Connection 1219-LM

 Physical Address
 00-F1-F382-98-2C

 DHCP Enable
 Yes

 IPv4 Address
 10.07.32
 Connection-specific Description Physical Address DHCP Enabled IPv4 Address IPv4 Subnet Mask 9 255 255 255.0 255.255.255.0 Thursday, July 20, 2017 10.03:29 PM Friday, July 21, 2017 10.03:29 PM 10.0.7.254 10.0.7.254 10.0.7.238 IPv4 Subnet Mask Lease Obtained Lease Expires IPv4 Default Gateway IPv4 DHCP Server IPv4 DNS Servers F1-F3-B.. 10.0.7.237 10.0.7.237 10.0.7.236 10.0.7.237 10.0.7.238 IPv4 WINS Servers NetBIOS over Tcpip Enab... Yes Link-local IPv6 Address fe80: fe80: b9a6:3c:f71f:5032%6 IPv6 Default Gateway IPv6 DNS Server Intel® Management and Security Status Close Remote Control session is connected. To disconnect, select "Stop Sessions" or press 1 item selected 3 items Shift+Escape. G Settings 🛛 😧 Intel® vPro[™] Platform (intel) Solution Manager Devices * + 10.0.7.32 Disconnect * Firmware Version: 11.0.25.3001 10.0.7.32 Intel® AMT MISC Intel Active Management Technology. KVM Remote Control IDE-r ▼ Pwr mgmt ▼ Ø -Disconnect Ctrl+Alt+Del 0 Life at a cila 😂 Par Click to collapse VP e 108 AM



Power management and boot options are available directly from the Platform Solution Manager even if the system is powered off. This example shows resetting the system and booting into the BIOS.





A system being controlled remotely can even be booted remotely controlled through the BIOS configuration.





5. Web Accessibility

Systems configured for AMT are also accessible using a standard web browser. Some AMT configuration is available in this interface. Access the Web UI by entering the IP address and one of the following port numbers into the address bar of the web browser:

16992 – Use if TLS is NOT defined (use http) 16993 – Use if TLS is defined (use https)

← ← € http://10.0.7.32: x	16992/index. 🔎 🕆 🖒 🧭 Intel	Active Management ×	- □ <mark>×</mark> ☆ ★ 8
Intel [®] Active Man _{Computer:}	agement Technol	ogy	intel
System Status Hardware Information System Processor Memory Disk Battery Event Log Remote Control Power Policies Network Settings IPv6 Network Settings System Name Settings User Accounts	System Status Power IP address	On 10.0.7.32	
	IPv6 address System ID Date	Disabled 03000200-0400-0500-0006-000700080005 7/21/2017 10:56 am)
	Refresh		
	Copyright © 2005-2017 Intel Cor	poration. All Rights Reserved. Intel® Active Management Tec	hnology firmware version: 11.0.25-build 3001



6. References

- a. <u>Getting Started with Intel® Active Management Technology (AMT)</u>
- b. Introducing the Intel® vProTM Platform Solution Manager
- c. <u>vPro Platform Solution Manager</u>
- d. Intel MEBX users guide
- e. Intel AMT Implementation and Reference Guide
- f. Intel AMT 10 Start Here Guide

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