This Setup Guide details what makes a true Intel® vPro™ technology-based PC, and how to set up and configure Intel® AMT (Active Management Technology) and Intel® KVM Remote Control (keyboard, video, mouse) on an Intel vPro technology-based PC.
## WHAT’S IN the Setup Guide

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Intel vPro technology provides system access and the ability to remotely isolate and repair systems after OS failure. This is accomplished using Intel® Active Management Technology—a powerful tool for remote and out-of-band PC management—and Intel® KVM Remote Control, which lets you control the keyboard, video, and mouse of a remote PC.

However, this remote access contains inherent security risks requiring the use of secure passwords to make the connection. The steps outlined in this Setup Guide will help you configure your PCs and ensure that they are protected.

An Intel vPro technology-based PC (desktop or mobile) includes the following components:

- Intel® Core™ i7 vPro™ processor, Intel® Core™ i5 vPro™ processor, or Intel® Core™2 vPro™ processor
- Current generation chipset: Q57 (for Intel Core i5/i7) Q57 chipset with Intel Core i5 vPro processors (exclusive platform configuration for Intel KVM Remote Control)
- Previous-generation chipsets: Q45 (for Intel® Core™2 Duo) and Q35 (for Core 2)
- Intel® LAN on motherboard network card (Intel-based NIC)
- Embedded management firmware
Intel AMT is a powerful hardware-based technology for security and remote management of PCs. With Intel AMT, IT administrators can remotely monitor and manage computers any time. Access to the PC is available when the power is off, the OS is inoperable, management agents are missing, or hardware (such as a hard drive) has failed. When integrated into a third-party management solution, computers with Intel vPro technology let service providers spend less time managing the computer and more time focusing on strategic business initiatives.

Intel KVM Remote Control is one of many features found in Intel AMT. Intel KVM Remote Control is embedded in the hardware, enabling IT administrators to repair an employee’s or customer’s PC remotely both above and below the OS. Intel KVM benefits include:

- A pre-installed, built-in VNC-based solution in the user’s PC
- No client agents required
- Works with any VNC-based viewer (versions 3.3, 3.8, or 4.0) that has tested interoperability with Intel KVM (based on RFB protocol)
Intel KVM offers several improvements over traditional KVM solutions. Unlike software-based KVM, Intel KVM allows repair of BIOS problems, pre-and post-boot, OS freeze-ups, OS shutdowns, and the network stack. Unlike a NIC-based KVM, the Intel solution requires no additional hardware or software on the client and includes built-in security.

System requirements

To begin the setup and configuration procedure, you need the following:

- An Intel vPro technology-based client PC (this is the end-user vPro client PC that is being configured)
- A remote management console (this PC is used by Intel® Channel Partners or IT managers to configure the client PC)
- Two USB flash drives
  - The first will be used for the Intel AMT Configuration Utility
  - The second USB flash drive will be formatted with a special file that is used during reboot (Section 1, Option 1, Step 3)
Intel AMT must be configured with the appropriate security, network, and operational parameters before a third-party management application can access its capabilities.

In this guide, we will refer to the Intel vPro technology-based PC for the end user as “the client PC,” and the PC being used by the IT manager to configure it as the “remote management console.”

Let’s start with setting up Intel AMT, which has two configuration options:

1. Using the Intel AMT Configuration Utility (for small PC networks) or
2. Using Intel® Setup and Configuration Service Lite (for large networks—more than 100 PCs)

**Option 1:**
Using the Intel AMT Configuration Utility (for small PC networks) 7

**Option 2:**
Using Intel SCS Lite (for larger PC networks) 13
You will need two new USB flash drives. Each must be less than 2GB.

Launch the activator GUI from the USB flash drive where you installed the activator software.

Insert the second USB flash drive (the drive will be erased and formatted).

Reboot.

Verify that Intel AMT is configured on the client PC.

Intel AMT configuration is complete. You are now ready to configure KVM.
SECTION 1: Option 1: Using the Intel AMT Configuration Utility (for small PC networks)

This option is recommended for smaller PC networks (less than 100) because it allows you to run a Windows* based utility on the client PC. There is no need to enter the BIOS to configure the client PC.

1. You will need two blank USB flash drives. Each must be less than 2GB
   - Load the first blank USB drive with the Intel AMT Configuration Utility
2. Insert both USB flash drives into the client PC to be provisioned
Launch the Intel AMT Configuration Utility from the first USB flash drive

- Step through the screens of the wizard. The first screen is a welcome screen, click Next
- Enter the desired configuration data, click Next
- Select the second USB flash drive from the drop-down list. This drive will be reformatted, so make sure the correct USB drive is selected.

Ensure the second USB flash drive is inserted into an active USB port on the client PC. Select it from the list. Click Next.
Confirm that you want to format the second USB drive and you will see this screen. Click Next (this will take about 10 to 15 seconds).

When you see this screen, click Finish and keep the second USB flash drive inserted in the USB. Remove the first USB flash drive.
During the boot process, the BIOS will find the second USB flash drive and load the setup.bin file that was created. Press “Y” when prompted and then hit any key to proceed with booting. This takes about 5 seconds.
After the reboot into Windows*, verify that Intel AMT is configured. Double-click the IMSS ICON in the tool tray on the client PC. Go to the advanced tab of the IMSS interface. Confirm that the status is “configured.” You have now provisioned Intel AMT. You have set the password, policy and power settings. This system can now be controlled by any Intel vPro technology enabled management software.

**Intel AMT configuration is complete. You are now ready to configure KVM. Go to Page 34, Section 2 “How to set up KVM Remote Control.”**

NOTE: If you completed Option 1 above, you should NOT complete Option 2.
SECTION 1: Option 2: Using Intel SCS Lite
(for larger PC networks)

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01 Install SCS lite on a desktop or server in your domain or workgroup environment. The SCS Lite utility can reside in one of many locations to allow you to complete the configuration process.

02 Make sure you have an active network connection from the remote management console and the client PC.

03 Launch SCS Lite from the remote management console.

04 Create a profile for the client PC that you will configure.
   - Creating a Profile
   - Configuring Optional Settings
   - Defining Domains in the Setup
   - Defining Network Setups in the Profile
   - Creating WiFi Setups
   - Defining System Settings

05 Create a pre-shared key (PSK) and load onto a USB flash drive. Each PSK is unique and can be used to set up only one PC.

06 Insert the USB drive with pre-shared keys into the Intel vPro technology-based PC.

07 Reboot.

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08 Plug in USB drive with activator utility into client PC.

09 Launch the activator GUI from the USB flash drive.

10 Connect to the SCS service on the remote management console.

11 Setup is complete.

12 Verify that Intel AMT is configured on the client PC.
Intel Setup and Configuration Service Lite (Intel® SCS Lite): How to remotely select a preconfigured profile using Intel SCS Lite

In setup option 2, we will remotely select a preconfigured profile using Intel SCS Lite. This option is recommended when you are configuring 100 or more PCs, because it allows for a more streamlined configuration process and can help eliminate input errors. However, this method can be used for fewer than 100 PCs if it makes sense for your environment.

Supported operating systems for Intel SCS Lite include:

- Windows XP Professional SP2* (validated)
- Windows Server 2003x64* and Enterprise x32* (validated)
- Windows XPx64* (supported, not validated)
- Windows Vista Enterprisex32/x64* and Business x32* (supported, not validated)
Prior to installing Intel SCS Lite, you need to:

- Have local administrator privileges on the computers where you want to install SCS components
- Make sure .NET Framework version 2.0 is installed on the computer
- Create a user account to run the Intel SCS windows service
- Ensure that the network access setting is “Classic” if the Intel SCS is installed in a Windows* Workgroup environment
- Ensure that all users who will need access to the Intel SCS have the required permissions

1 Install Intel SCS Lite. Intel SCS Lite must reside within your firewall on a desktop or server in your domain or workgroup environment. Intel SCS Lite can reside in one of many locations to allow you to complete the configuration process.

2 Make sure you have an active network connection from the remote management console to the client PC

- To verify an active network connection, open the Command prompt on the remote management console, perform ping command to the client PC
- If ping fails, check the network connection and firewall settings. You need to make sure there is an active network connection before you can proceed.
Launch Intel AMT SCS console

On the remote management console, double-click the Intel Setup and Configuration Service icon.
Create a profile for the client PC that you will configure

A configuration profile enables you to set up multiple Intel AMT systems with the same set of configuration properties. It is possible to create several profiles with different settings and select from the profiles when you want to configure the systems. The Intel SCS Lite console includes a wizard that you can use to create and modify the profiles. The profiles you create are displayed in the Configuration Profiles node of the console tree.
Creating a Profile

1. Select Configuration Profiles from the console tree, and perform one of the following:
   - Right-click and select Add Profile
   - From the toolbar, click Actions > Add Profile

2. The Getting Started window of the Configuration Profile Wizard appears.

3. In the Profile Definition section, enter a name and description for the profile or leave the default values. The profile name must be unique.

4. Click Next. The Optional Settings window appears.
4 B Configuring Optional Settings

Select the check boxes of the optional settings you want to configure and click Next to continue in the Configuration Profile Wizard and configure the settings.
Defining Domains in the Setup

The Home Domains window of the Configuration Profile Wizard enables you to define a list of domains where the Intel AMT system is permitted to operate.

1. Click Add. The Domain Properties window appears.
2. Enter the DNS suffix and click OK. The Domain Properties window closes and the domain appears.
3. Or you can select Allow Intel AMT functionality via VPN. This configures Intel AMT systems to accept management traffic over a VPN connection when Intel AMT detects that the system is operating outside the enterprise network.
The Network Configuration window enables you to configure which protocols will be used between an Intel AMT device configured with this profile and a wireless access point. You can define network setups in the profile by selecting one of the following:

- Allow WiFi connection without WiFi setups: Using the host WiFi settings, define a home domain in the Home Domains list and do not select a WiFi setup.
- Allow WiFi connection with the following WiFi setups: Perform the following to define up to 15 profiles in the WiFi setup list.
  - Add a new WiFi setup to the list by clicking **Add**
  - Edit an existing WiFi setup by clicking **Edit**
  - Remove a WiFi setup from the list by clicking **Remove**
Creating WiFi Setups

1. From the Network Configuration window, click **Add**. The WiFi Setup window appears.

2. In the Setup Name field, enter a name for the WiFi setup.

3. Optionally, in the SSID field, enter a Service Set Identifier (SSID). The SSID must be a string of 1 to 32 characters naming a specific wireless LAN.
4. From the Key Management Protocol drop-down list, select one of the following:
   - WiFi Protected Access (WPA)
   - Robust Security Network (RSN)

5. From the Encryption Algorithm drop-down list, select one of the following:
   - Temporal Key Integrity Protocol (TKIP)
   - Counter mode CBC MAC Protocol (CCMP)

6. In the Authentication section, enter a Passphrase for the WiFi setup. The Passphrase must contain between 8 and 63 printable ASCII characters.

7. Click OK. The WiFi setup appears in the WiFi setup list.
Defining System Settings

The System Settings window of the Configuration Profile Wizard enables you to define a profile’s default network, security, and power management settings.

In the Management Interfaces section, select the interfaces you want to enable with this profile:

- **Web UI** — Enables you to manage and maintain Intel AMT systems using a browser-based interface
- **Serial Over LAN** — Enables you to remotely manage Intel AMT systems by encapsulating keystrokes and character display data in a TCP/IP stream
- **IDE Redirection** — Enables you to remotely enable, disable, format, or configure individual floppy or IDE CD drives and to reload operating systems and software from remote locations. These actions are independent of and transparent to the host.
2. From the drop-down list in the Power Management Settings section, select one of the following:

- **Host is on (S0)** — The Intel AMT manageability features are available only if the operating system of the Intel AMT system is up and running.
- **Always on (S0-S5)** — The Intel AMT manageability features are available in any of the system power states, provided the computer is connected to the power supply.

3. If you selected **Always on (S0-S5)**, in the “time out if idle” field, enter the minimum time (in minutes) that the Intel AMT ME device will remain operable when there is no activity. The device will return to a sleep state after the idle timeout period. The timeout timer is restarted whenever the device is serving requests. If the value of the parameter is zero, the device will remain on when there is no activity.
4 In the ME Bios Extension (MEBx) password field, enter the password used during Remote Configuration. If the MEBx password of the Intel AMT device is the factory default, the Intel SCS will change it to the password you enter here.

5 In the “set the password of the admin user” field, define the password used by the Administrator (“admin”) for remote communication with the system. The password must be at least 8 characters, with at least one of each of the following:

- A number
- A non-alpha numeric character (note that “_” is considered alpha numeric)
- A lowercase Latin letter
- An uppercase Latin letter

6 Optionally, select **Enable Intel AMT to respond to ping requests**. When this box is selected, the Intel AMT device will respond to a ping.

7 Click **Finish** to save the profiles you have set up.
Create a pre-shared key (PSK) and load onto a USB flash drive. Each PSK is unique and can be used to set up only one PC.

A From the console tree, select **TLS-PSK Configuration Keys** and perform one of the following:

- Right-click and select **Add Security Keys**
- From the toolbar, click or select **Actions > Add Security Keys**

The Create TLS-PSK Keys window appears.

B In the “number of keys to store” field, enter the number of keys that you want to create (up to 1024 keys)

C In the manufacturing default MEBx password field, enter the MEBx password that was entered in the firmware by the manufacturer
5 D In the New MEBx password section, select one of the following:

- **Fixed Password** — Select to use the same password with all the keys, and enter the password that you want to use.
- **Randomize Password** — Select to create a different, random password for each key.

5 E Click OK. The Create TLS-PSK window closes and the generated key values appear on the list.

6 Remove the USB flash drive from the remote management console PC and insert that same USB flash drive with pre-shared keys into the client PC.

7 Reboot.

Select the “Y” key when prompted. PSK is now installed on your Intel vPro technology-based system (client PC).

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Intel(R) Management Engine BIOS Extension
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Found USB Key for provisioning Intel(R) AMT
Continue with Auto Provisioning (Y/N)
Plug in USB drive with Intel AMT Configuration Utility into client PC

If the Intel AMT Configuration Utility is already loaded on the client PC, right-click the configuration tool shortcut icon and select Run as administrator.

If you choose to run the Intel AMT Configuration Utility directly from a USB flash drive, insert a new USB flash drive (that was not used with the PSK in Step 5) and launch the Intel AMT Configuration Utility from that USB flash drive.
Connect to the SCS service on the remote management console

Select Connect to a service. Click Next.
Ensure this computer is part of a workgroup is selected. Input the following: Server name: This is the computer name of the remote management console. In this example it is “laptop1”. Username with permissions on server: This is your Windows login name for the setup and configuration PC or server. Password: This is your windows login password for the setup and configuration PC or server. Click Next.

In the drop-down box, select the profile you created previously. Click Next.
You should now see this screen. The client PC is downloading the profile settings you created.
11 **Setup is complete**

Click Finish.

12 **Verify that Intel AMT is configured on the client PC**

Double-click the IMSS ICON in the tool tray on the client PC. Go to the advanced tab of the IMSS interface. Confirm that the status is configured. You have now provisioned AMT. You have set the password, policy, and power settings. This system can now be controlled by any Intel vPro technology-enabled management software.

You are finished configuring Intel AMT. Now we'll move on to Section 2, using KVM (keyboard, video, and mouse).
Intel KVM (keyboard, video, and mouse) Remote Control is built-in to Intel vPro technology-based PC platforms to help you remotely manage your PCs. From boot to working in the OS, the KVM session never loses connection. Intel KVM Remote Control is embedded in hardware enabling IT to fix problems remotely above and below the OS. (See “What is Intel KVM Remote Control?” on Page 4.)
This section will walk you through setting KVM in a small network. Verify that Intel AMT is configured on the client PC (See step 5 on Page 12.)

1. Choose your connection method.
2. Input your Intel AMT authentication username and password.
3. You should see these images on your screen:
4. Setup is complete. You are now connected.
This section will walk you through setting up KVM in a small network. Verify that Intel AMT is configured on the client PC (See step 5 on Page 12.)

For this example we are using RealVNC Viewer Plus*. http://realvnc.com

From your Remote Console PC: double-click the desktop icon to launch the connection window.
Choose your connection method.

- **RealVNC**

Input the machine name or IP address of the PC you want to control with KVM. Choose your encryption level. Ensure Intel® AMT KVM is selected for your connection mode. Click Connect.
Input your Intel AMT authentication username and password.

Input your Intel AMT user name and password when prompted. Note: this is the username created during the provisioning process. This is NOT a windows log in user name and password.
4 You should see these images on your screen:

Remote management console:
The screen is ready to have the User Consent Code input. Client PC: You will see the User Consent Code screen pop up. Input this code into the remote management console.

5 Setup is complete. You are now connected.
More information on Intel vPro technology, Intel Active Management Technology, and Intel Remote KVM is available at the links below.

**Intel® vPro™ Expert Center**
Main website with an array of technical documentation, tools, community forums, and tips

**Provisioning Method Selection Guide**
Describes all the methods for provisioning manually or with Intel-supplied activation tools

**Detailed Activation Training**
Third party software documentation and training detailing how software vendors like Altiris*, LanDesk*, and Microsoft SCCM* integrated setup and configuration into their consoles

**Intel Tech Show Videos**
Live-action training and demonstrations of new technologies including the setup and configuration described in the document. (click on “Tech Show”)