Dell KACE Remote Management with Intel® vPro™ Technology

Effectively managing remote systems with hardware and startup issues
1.0 Introduction

As organizations become more distributed, IT administrators increasingly face the challenge of managing multiple remote locations while remaining cost-conscious. Dell KACE™ K Series Systems Management Appliance solutions are based on best practices gained from implementing systems in organizations with varying technology needs, while always providing outstanding customer value. The Dell KACE Appliances offer remote control capabilities that allow IT administrators the ability to manage clients with KACE agents.

With the latest versions of Intel® vPro™ technology, KACE Appliances now offer better than ever remote management capabilities for systems, even when the KACE agents are not running, the system is blue-screened or has hardware or startup issues. This paper details how Dell KACE Appliances can be integrated with the Intel vPro technology to offer effective remote systems management and recovery.

2.0 Overview

With the release of Intel® Active Management Technology (Intel AMT) 7.0, Intel has made it possible to easily provision Intel AMT configurations via an agent on the managed host (“Host-based Provisioning”). This allows customers to leverage existing Dell KACE K1000 Management Appliance capabilities to activate Intel AMT services on managed nodes. The activation of these services enables the remote management and recovery services of Intel vPro technology.

The functionality can also be facilitated on some systems running Intel AMT 6.x by upgrading the BIOS to the latest revision. Updating the BIOS on existing Intel AMT 6.x systems can be done manually or automatically using the Dell Client and Server Update feature of the K1000 Appliance when the target system is a Dell. For other vendors, customers will need to investigate their options or update manually.

The remote control and recovery services are accessed by using RealVNC through the K1000 managed action feature. A license cost is associated with RealVNC for each administrator that will be taking advantage of the capabilities of Intel vPro technology.

2.1 Intel® vPro™ Technology Integration Requirements

Intel vPro technology integration requires the following items:

- Dell KACE K1000 Management Appliance version 5.x
- Systems using Intel vPro technology with Intel AMT 7.0 or Intel AMT 6.x with BIOS revision applied
- Intel Unified AMT 7 Management Interface Driver installed on target systems*
- RealVNC Viewer Plus**

* Intel Unified AMT 7 Management Interface Driver is pre-installed on systems with Intel vPro technology
** A license cost is associated with RealVNC Viewer Plus for each administrator that will need to take advantage of the capabilities of Intel vPro technology.
2.2 Supported Systems with Intel® vPro™ Technology

Dell KACE supports the following configurations of Intel vPro technology:

- All Intel AMT v7 models support both KVM and Host-based Provisioning* (HBP) natively.
- Intel AMT v6 models support KVM natively but need to be upgraded to Intel AMT 6.2 (or later) firmware to include HBP support. The mechanism to upgrade to Intel AMT 6.2 varies across OEMs – e.g. for Dell this is accomplished by a BIOS upgrade, Lenovo requires a BIOS upgrade, an ME firmware upgrade and a software utility to enable.
- KVM support on all systems require the integrated processor graphics to be used (i.e. not discrete graphics).

Host-based Provisioning mandates User Consent (i.e. 6-digit random code on remote systems which must be entered on Admin console) for most of the operations Dell KACE does in the KACE-vPro environment. Intel Engineers that designed Intel vPro technology put this in to prevent the security risk of someone provisioning a system via a relatively insecure in-band channel and then having full uncontrolled access to all of the low-level hardware functions. This may/may not be an issue for someone using HBP and there may be a way to remove this limitation. There may be cases where provisioning via RCS (Remote Configuration Service) is preferred to HBP. The definition of the configuration is the same (i.e. via the wizard to produce the XML file) but the deployment of the configuration to the remote system is done across a secure out-of-band channel rather than via the agent. Users should consult the Intel SCS 7.1 documentation for more details.

Dell KACE supports the following systems which meet the requirements above***:

Dell Notebooks/Tablets
- Intel AMT v6 integrated – Latitude E4310, Latitude E6410, Latitude E6410ATG, Latitude E6510
- Intel AMT v7 integrated – Latitude E6220, Latitude E6320, Latitude E6420, Latitude E6420ATG, Latitude E6420XFR, Latitude E6520, Latitude XT3

Dell Desktops
- Intel AMT v6 integrated - OptiPlex 980
- Intel AMT v7 integrated - OptiPlex 990

Dell Tower Workstations
- Intel AMT v7 integrated – Precision T1600

Dell Mobile Workstations
- Intel AMT v6 integrated – Precision M4500
- Intel AMT v7 integrated - Precision M4600, Precision M6600

HP Notebooks/Tablets
- Intel AMT v6 integrated - EliteBook 2540p, EliteBook 2740p, EliteBook 8440p, EliteBook 8540, ProBook 6540b, ProBook 6450b, ProBook 6550b
- Intel AMT v7 integrated - EliteBook 2560p, EliteBook 2760p, EliteBook 8460p, EliteBook 8560, ProBook 6360b, ProBook 6460b, ProBook 6560b, ProBook 5330m

***Latitude E4310, Latitude E6410, Latitude E6410ATG, Latitude E6510, OptiPlex 980 are no longer offered for sale
HP Desktops
- Intel AMT v6 integrated – Compaq 8100 Elite
- Intel AMT v7 integrated – Compaq 8200 Elite

HP Tower Workstations
- Intel AMT v7 integrated – Z210

HP Mobile Workstations
- Intel AMT v6 integrated – EliteBook 8440w, EliteBook 8540w, EliteBook 8740w
- Intel AMT v7 integrated – EliteBook 8460w, EliteBook 8560w, EliteBook 8760w

Lenovo Notebooks/Tablets
- Intel AMT v6 integrated – Thinkpad X201, Thinkpad T410, Thinkpad T510, Thinkpad T410s
- Intel AMT v7 integrated – Thinkpad T420, Thinkpad T520, Thinkpad T420s, Thinkpad x220, Thinkpad x220t, Thinkpad x1

Lenovo Desktops
- Intel AMT v6 integrated – ThinkCentre M90P, ThinkCentre M90Z
- Intel AMT v7 integrated – ThinkCentre M91p

Lenovo Tower Workstations
- Intel AMT v7 integrated – ThinkCentre M91p

Lenovo Mobile Workstations
- Intel AMT v6 integrated – Thinkpad W510, Thinkpad W701
- Intel AMT v7 integrated – Thinkpad W520

3.0 Intel® vPro™ Technology Configuration

Configuring Intel vPro technology requires an understanding of which capabilities you would like to enable. Intel provides a tool called Intel Active Management Technology Configuration Utility for assisting with the creation of the configuration. Once the configuration is created, the K1000 Appliance can be used to deploy the configuration to systems with Intel vPro technology in your environment. This section will cover the creation and deployment of Intel vPro technology configurations.

For this section you will need to download the Intel SCS 7 Source Kit from the link below:
### 3.1 Creating an Intel® vPro™ Technology Configuration

Within the zip file you downloaded is a folder called ACU_WIZARD. In that folder you will launch the ACU_WIZARD.EXE.

Once you have launched the wizard you will select the option “Create Settings to Configure Multiple Systems”.
On the screen above you will need to click the New button to create a new profile. The screenshots that follow show all the options for configuration of your systems with Intel vPro technology. For details on the options available please refer to the Intel vPro technology documentation or click the help icon “?”.

Unless you selected another location prior to creating the configuration it will be saved to the current user’s documents folder under a folder called “SCS Profiles”.

On the Getting Started Screen shown above you will select Configuration/Reconfiguration, enter a description and click Next to continue.
The Optional Settings screen contains settings you can enable but that are not required for Integration of the Intel vPro technology with Dell KACE. For details on these options available please refer to the Intel vPro technology documentation or click the help icon “?”.

The Systems Settings screen allows you to enable the features of Intel vPro technology which will allow you to integrate with Dell KACE. Above is a configuration which will enable all of the features. The features you choose to enable in your environment may vary. Please refer to the Intel vPro technology documentation or the help icon “?” for details on these features.
For remote management with the Dell KACE K1000 you will want to enable the following options:

- KVM Redirection and specify password
- Power Management Settings – “Always On”
- Choose a password for Network Settings

On the Finish screen you can name your Configuration file and save it. This configuration will be used with the Dell KACE Appliances’ scripting feature to deploy this configuration to your systems with Intel vPro technology.

3.2 Discovering and Tracking Systems with Intel® vPro™ Technology

The K1000 Appliance allows you to discover and track systems with Intel vPro technology using the scripting module and inventory. There are many approaches and choices you can make to discover and track systems with Intel vPro technology. This section will outline one approach to handling discovery and tracking.

To create a discovery script you will need to go into the Scripting feature of the K1000 Appliance and:

1. Select Add New Item from the Choose Action drop down menu.
2. On the script detail page you will give the script a name (ex. vPro Discovery/Detection).
4. Make sure Pick Specific OS Versions is unchecked.
5. Select Microsoft Windows from the Supported Operating Systems list.
6. Scroll down to Dependencies and click the Add new dependencies link to add the following files from the SCS_Discovery folder you unzipped in Section 2.1:
   - SCSDiscovery.exe
   - Xerces-c_2_8.dll
7. Scroll down to the Policy or Job Rules section and click the Add Task Section link to create a new task section.
8. In Task 1 under Verify click the Add link.
9. Select Launch a program from the drop down menu and fill in the following options:
   - Directory: $(KACE_DEPENDENCY_DIR)
   - File: SCSDiscovery.exe
   - Wait for startup: Checked
   - Parameters: /Output Silent SystemDiscovery vProDiscovery.xml
10. In Task 1 under Success click the Add link.
11. Select Upload a file from the drop down menu and fill in the following options:
    - Directory: $(KACE_DEPENDENCY_DIR)
    - File: vProDiscovery.xml
12. In Task 1 under Remediation click the Add link.
13. Select Upload a file from the drop down menu and fill in the following options:
    - Directory: $(KACE_DEPENDENCY_DIR)
    - File: vProDiscovery.xml
14. Scroll down and click Save to save this script.

Using Labeling or Run Now within the scripting module you can now revisit this script and decide which systems in your environment against which you would like to run discovery. This script will scan a system for its Intel vPro technology settings and write them all to the registry, as well as to a file named vProDiscovery.xml. It will then upload the Intel vPro technology settings file to the appliance, which will be available under the Uploaded Files section of a computer’s inventory record for you to review from the web interface. Since these settings are written to the registry, you can also take advantage of the K1000’s Custom Inventory Fields feature to make desired Intel vPro technology settings part of the inventory view, making them available for label criteria and report building. Two examples of Intel vPro technology settings that are important for reporting and deployment are Intel AMT State and Intel AMT Version. Using Custom Inventory Fields you can capture this data and make it part of your computer inventory within the appliance.

To create a field for Intel AMT Version:

1. Navigate to Inventory and then the Software tab within your appliance.
2. Select Add New Item from the Choose Action drop down menu.
3. Fill out the following values on the Edit Software Detail Screen:
   - Display Name (Title): vPro – AMT Version
   - Publisher (Vendor): Dell KACE
   - Display Version: 1.0
   - Supported Operating Systems: Select all Windows Operating Systems
   - Custom Inventory Rule: RegistryValueReturn(HKEY_LOCAL_MACHINE\SOFTWARE\Intel\SCS7.0\System_Discovery,AMTversion,TEXT)
   - Scroll down and click Save.
To create a field for Intel AMT State:

1. Navigate to Inventory and then the Software tab within your appliance.
2. Select Add New Item from the Choose Action drop down menu.
3. Fill out the following values on the Edit Software Detail Screen:
   - Display Name (Title): vPro – AMT State
   - Publisher (Vendor): Dell KACE
   - Display Version: 1.0
   - Supported Operating Systems: Select all Windows Operating Systems
   - Custom Inventory Rule: RegistryValueReturn(HKEY_LOCAL_MACHINE\SOFTWARE\Intel\SCS7.0\System_Discovery,AMTState,TEXT)
   - Scroll down and click Save.

Once you have created these fields, machines that have been discovered by the script created earlier will begin reporting in their Intel vPro technology configuration to the appliance during inventory as shown above. This information will be available for searching, reporting and in other areas of the appliance.

### 3.3 Deploying an Intel® vPro™ Technology Configuration with the K1000

Once you have discovered the machines in your environment that have Intel vPro technology and their version, you can start making decisions around how to provision machines. Using the information discussed in Sections 1.2 and the information we know about systems with Intel vPro technology in your environment from our discovery, we can build Labels in the appliance to target machines or choose to deploy configurations to machines manually. Using the Intel vPro technology Configuration file we created in Section 2.1, we will create a script for provisioning systems with Intel vPro technology.

To create a provisioning script you will need to go into the Scripting module of the K1000 Appliance and:

1. Select Add New Item from the Choose Action drop down menu.
2. On the script detail page you will give the script a name (ex. vPro Provisioning).
4. Make sure Pick Specific OS Versions is unchecked.
5. Select Microsoft Windows from the Supported Operating Systems list.
6. Scroll down to Dependencies and click the Add new dependencies link to add the following files from the ACU_Configurator folder you unzipped in Section 2.1:
   - ACUConfig.exe
   - Xerces-c_2_8.dll
   - ACU.dll
   - *Intel vPro technology Configuration XML file created in Section 2.1 (ex. MyConfig.xml)*

7. Scroll down to the Policy or Job Rules section and click the Add Task Section link to create a new task section.

8. In Task 1 under Verify click the Add link.

9. Select Launch a program from the drop down menu and fill in the following options:
   - Directory: $(KACE_DEPENDENCY_DIR)
   - File: ACUConfig.exe
   - Wait for startup: Checked
   - Parameters: /Output File vProConfigLog.txt ConfigAMT MyConfig.xml

10. In Task 1 under Success click the Add link.

11. Select Upload a file from the drop down menu and fill in the following options:
    - Directory: $(KACE_DEPENDENCY_DIR)
    - File: vProConfigLog.txt

12. In Task 1 under Remediation click the Add link.

13. Select Upload a file from the drop down menu and fill in the following options:
    - Directory: $(KACE_DEPENDENCY_DIR)
    - File: vProConfigLog.txt

14. Scroll down and click Save to save this script.

Now that this script is created, you can take a similar approach to what was done previously during discovery. Using Labels or the Run Now feature, you can deploy this script to provision machines. You can also restrict your deployment with the data we collected with Custom Inventory Fields. You can create your Labels for deployment based on the “vPro – AMT Version” being greater than a certain number or by the “vPro – AMT State” being in a “Pre Provisioning” or “Post Provisioning” state. This previously collected information will allow you to target the desired systems for the configuration you would like to deploy.

As mentioned in Section 1.1, Intel Unified AMT 7 Management Interface Driver will need to be installed for you to provision the targeted system with Intel vPro technology. This driver comes pre-installed on systems with Intel vPro technology, but in the case of re-built machines, you must ensure that this driver has been installed on your system.

### 4.0 Remote Control and Management

Dell KACE integration of Intel vPro technology allows you remote control to systems in your environment regardless if they are powered on or off. RealVNC Viewer Plus can be used for remote power on/off, access to BIOS and remote control. In this section we will walk through configuration of the remote control solution for Intel vPro technology Integration.
4.1 Using RealVNC Viewer Plus

RealVNC Viewer Plus allows you to take full advantage of the remote management capabilities of Intel vPro technology. RealVNC Viewer Plus can be downloaded at [http://www.realvnc.com/products/viewerplus/](http://www.realvnc.com/products/viewerplus/). A trial version is available for a limited time after which you will be required to purchase a full license.

Once you have installed the application the first step will be configuring the K1000 to launch RealVNC as your remote control solution. This can be done by navigating to Settings and clicking on General Settings under the Control Panel tab.

On the General Settings page scroll down the Machine Action section and click the Edit Mode button. You will then be able to edit the commands for the Machine Action button.

Change one of the Machine Actions to the following command:

- `kvm://admin@KACE_HOST_IP/

Once set, you can click on this icon next to a machine in computer inventory to launch RealVNC Viewer Plus into KVM mode, setting the username to admin. You will then need to enter your KVM password to access the targeted system as shown above.
After connecting to the remote system, scrolling to the top of the RealVNC Viewer will display some options available to you in the control bar. Click on the red power button to access the power options for Intel vPro technology.

From the Power menu you’ll be able to power on, power off or reset machines.

If you choose to Power On a system, you will be given the option to Boot to BIOS or Boot to OS. Booting to BIOS will allow you to make changes to the BIOS that you would previously need to visit the machine to change. Booting from the OS will boot the system, allowing you to view and remote control the boot process as if you were sitting at the remote system.

These are the remote control capabilities that Dell KACE integration of Intel vPro technology will enable with RealVNC Viewer Plus.
Dell KACE Corporate Background

Dell (NASDAQ: DELL) creates, enhances and integrates technology and services customers count on to provide them reliable, long term value. Dell provides systems management solutions for customers of all sizes and system complexity. The award-winning Dell KACE family of appliances delivers easy-to-use, comprehensive, and affordable systems management capabilities.

Dell KACE is headquartered in Mountain View, California. To learn more about Dell KACE and its product offerings, please visit www.dell.com/kace or call 1-877-MGMT-DONE.

Helpful Links:
- KACE Systems Management Appliances
- KACE Systems Deployment Appliances

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