

Considerations for Deploying Intel[®] Smart Connect Technology

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1 *Summary*

Smart phones and tablets have the ability to deliver all day battery life and always updated content at the user's fingertips. Today's PCs are immensely capable productivity machines but when it comes to information flow the systems need to be powered up, connected to a network, and authenticated prior to getting updated information. That takes time and there's a period where the user is not productive. Today's PCs do not deliver the "always updated" data experience that users enjoy on their companion devices – like smart phones.

Starting in 2012, some PCs will be able to deliver a similar "fresh data" experience with Intel® Smart Connect Technology. Intel Smart Connect Technology will keep user data updated when the system is asleep, as long as it is around a network connection. Users will start making decisions on what device they pick up based on what they want to do with the data and not which device gets them the data quicker.

Intel Smart Connect Technology is a recommended feature for 2012 Business Ultrabooks™, including those from Lenovo*, Dell*, and HP*, and will be available on some standard business class notebook PCs as well.

The purpose of this document is to provide Information Technology organizations with information on how to set up their managed client PCs and their IT infrastructure to take advantage of Intel Smart Connect Technology.



2 *Implementation Considerations*

This section provides considerations for IT technicians to keep in mind when implementing Intel Smart Connect Technology. It also provides a recommended process for setting up and configuring both your individual managed PC clients and your IT infrastructure to take advantage of Intel Smart Connect Technology.

Note that no new hardware or software is required (such as additional silicon, secondary network connection, etc.). If you have purchased a PC client with Intel Smart Connect Technology, then you have everything you need. It's just a matter of configuring it.

2.1 **Trade-offs: Update Frequency vs. Battery Life**

Updates can occur as frequently as every 5 minutes or as infrequently as every 60 minutes. The more frequently you update, the more battery power will be used. That said, it is important to note that Intel Smart Connect Technology will not drain your system's battery completely. Once the battery level reaches less than 15%, Intel Smart Connect Technology will disable itself until battery power rises above that threshold. For organizations that use Microsoft Exchange and Outlook, Intel recommends a 15 minute update frequency for best user experience.

Additionally, you can specify a block of time during the day or night as "Extended Power Savings" (for example, from 7:00 pm to 7:00 am) that will update less frequently during the Extended Power Savings time period. The Extended Power Savings settings are configured on the Advanced tab of the GUI.

Note: *If the system has Intel Rapid Start Technology, Intel Smart Connect Technology will use Intel Rapid Start Technology during the Extended Power Savings time to minimize energy consumption.*

2.2 **Re-imaging**

If you need to reimage a client system, be sure to download the latest BIOS image that supports Intel Smart Connect Technology and Intel Smart Connect Technology software from your OEM's website. If you do not want to enable Intel Smart Connect Technology on your systems, we recommend that you turn off Intel Smart Connect Technology in the BIOS and do not include the Intel Smart Connect Technology software in the gold image for reimagining your systems. The Intel Smart Connect Technology software cannot be installed if it detects that the BIOS does not support Intel Smart Connect Technology or that the feature has been disabled in the BIOS.



2.3 Applications

Intel Smart Connect Technology will update information while systems are in a sleep state as long as an Internet connection is available. However, there are applications available that can store Internet data to the local drive and sync with the Internet (or cloud) to allow the user to work with the sync'd data offline when an Internet connection is not available.

For example, Microsoft Outlook, Mozilla Thunderbird and Microsoft LiveMail can store Gmail, Yahoo! Mail, Hotmail, etc. email to the hard drive. Applications like Sobeas can store your Facebook, Twitter, LinkedIn, MySpace, and RSS feed data to your hard drive.

Many applications can take advantage of Intel Smart Connect Technology. Look for the following characteristics in applications to get the best user experience with Intel Smart Connect Technology:

- The application looks for updates automatically or in a short time period (e.g., every 10 minutes) when connected to a network
- The application stores content from the Internet locally on the hard drive
- If applicable, the application caches user account credentials so that updates can be retrieved in sleep state without user interaction

With regard to operating systems, Intel Smart Connect Technology works with the Microsoft Windows 7 and Windows 8 operating systems.

2.4 Security

Recently, information security has bubbled up to the top of most users', and IT managers', concerns when it comes to their data. In this section, we look at the considerations for implementing Intel Smart Connect Technology with two of the most common information security technologies in your IT environment: virtual private networks (VPNs) and encryption.

2.4.1 Virtual Private Networks (VPNs)

Most enterprise-class VPNs offer IT departments the ability to cache the user's credentials in order to automatically reconnect upon returning from a sleep state, provided the user has previously authenticated prior to entering the sleep state. For example, a VPN may specify a time period (such as 24 hours) wherein if the user has authenticated and then entered a sleep state (say, by closing the laptop lid), the PC can automatically reconnect to the VPN when it wakes (i.e., the lid is opened) without the user having to re-authenticate.



This is important for Intel Smart Connect Technology so that it can reconnect to the corporate network and update a user's corporate application data (for example, Microsoft Outlook) without requiring user interaction to authenticate to the VPN.

When taking advantage of this re-authentication feature in a VPN, Intel recommends that you test the amount of time it takes for your VPN to automatically reconnect. The longer it takes for your VPN to reconnect, the more battery power is used for each periodic data update. The recommended goal is to have your VPN reconnect to the corporate network in under 5 seconds.

Cisco* AnyConnect v2.5 or later and Check Point* Remote Access E75.30 or later are good examples of VPNs with sub-5-second reconnect times. If your VPN does not reconnect quickly, Intel recommends you work with your VPN provider to improve their reconnect time.

2.4.2 Encryption

Intel Smart Connect Technology works with software-based encryption solutions (for example, PGP and BitLocker). It will not work with encryption solutions that require authentication when resuming from Sleep (S3).

Keep in mind that Intel Smart Connect Technology only works in Sleep (S3) state. Intel Smart Connect Technology is disabled when the system moves into Hibernate state or Shut Down.

Appendix A : Technical Overview

This section provides a technical overview of Intel Smart Connect Technology, including the System Tray icon, Configuration Wizard, and Settings application, as well as an overview of content updating and NetDetect operation.

A.1 System Tray Icon

The System Tray Icon for Intel Smart Connect Technology provides a convenient shortcut for invoking the configuration applications and obtaining status.



Right-clicking the icon displays a shortcut menu with the following options:

- *Open Wizard* opens the Intel Smart Connect Technology Wizard that guides the user with configuration settings
- *Open Configuration Utility* opens the Intel Smart Connect Technology Settings application for general settings and additional information
- *Learn More* opens the help file
- *Exit* dismisses the context menu



A.2 Wizard Application

The Intel Smart Connect Technology Wizard application provides a guided step-by-step configuration utility. The utility is invoked by selecting it from the system tray icon.





The second screen of the Wizard allows the user to enable or disable the Always Updated feature. The current state (Enabled/Disabled) is reflected in the question text and the button label.





The third Wizard screen allows the user to set the update frequency.





Once the update frequency is set, the user can then set the hours of extended (or Nighttime) power savings.





The final page of the Wizard allows the user to proceed to the Configuration Utility by selecting the checkbox option; if the option is unchecked the Wizard will simply exit when the "Finish" button is clicked.

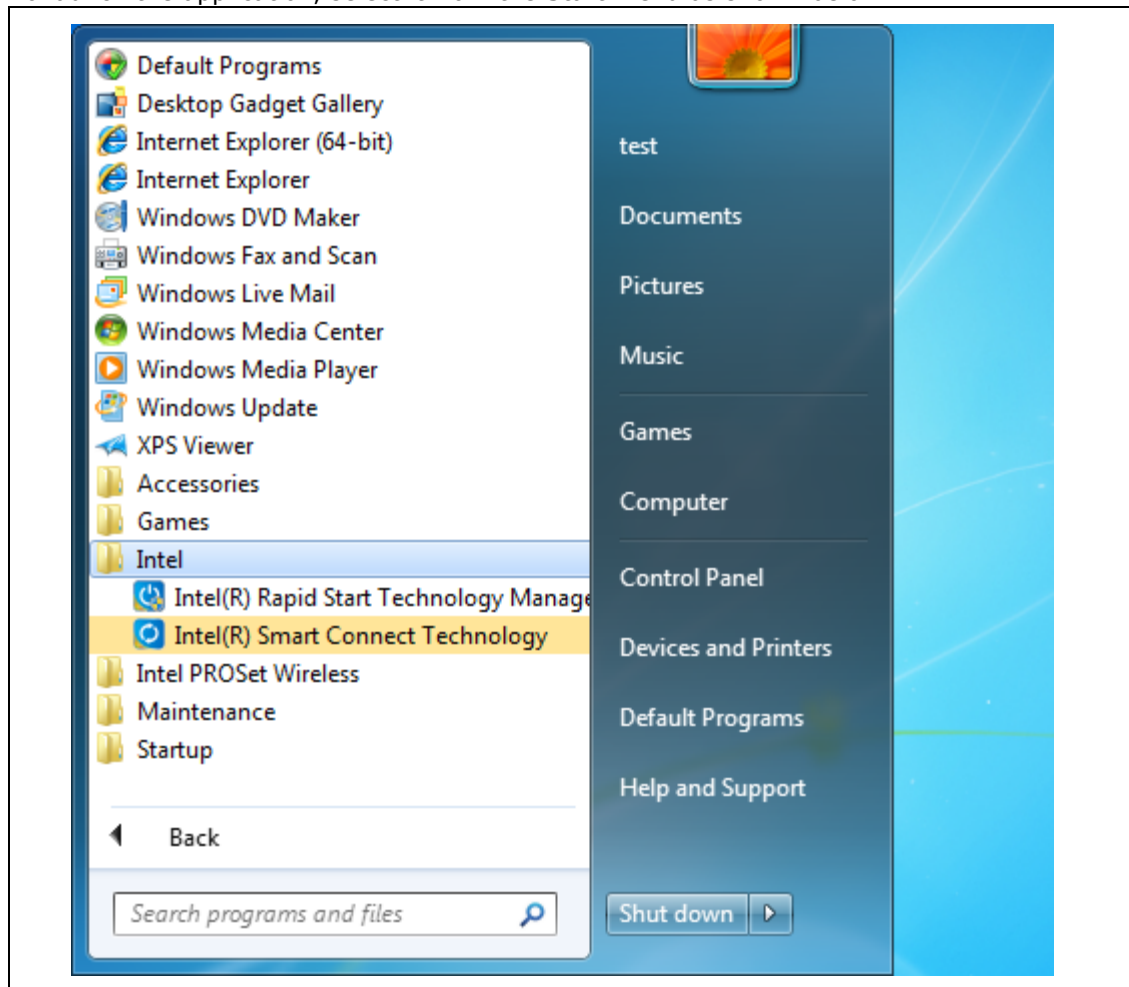




A.3 Settings Application

After enabling Intel Smart Connect Technology, the Settings application can be accessed through the Start menu (shown below) or through the system tray icon to make changes to settings.

To launch the application, select it from the Start menu as shown below.





A.4 Content Updating

Once Intel Smart Connect Technology is configured and enabled on the platform, content updating is performed by the platform periodically waking from S3 (or Rapid Start S4). The following steps illustrate a typical usage scenario.

1. Verify configuration settings with the Configuration application
2. Verify one or more of the applications are running on the platform that can refresh data from the Internet.
3. The platform enters S3 either by the user suspending the platform or the unattended sleep timer expiring.
4. After the enters Sleep, the platform wakes from S3 and applications running are given a short period of time (if network connection exists) to update the content.
5. After the short period of time (approximately 30 seconds if network connection exists), the platform transitions back to S3.

A.5 NetDetect Operation

If the platform supports NetDetect (feature of Intel® Centrino Wireless LAN), the platform will only wake from S3 if a user specified Access Point is found. A user-specified Access Point is one that has been set up in the wireless network connection manager in the OS. This prevents unnecessary wakes from S3 if no network connection exists prior to the platform entering S3. The following steps illustrate a typical usage scenario.

1. The Intel Smart Connect Technology Agent determines no network connection exists prior to the platform entering S3
2. If the user transitions the platform to S3 (manually or via OS unattended timer), the Agent will require one periodic wake cycle to successfully enable NetDetect due to OS limitation of time allowed for Agent to transition to S3.
3. Once the periodic wake occurs, Agent will configure NetDetect in the WLAN NIC and the request OS to transition platform to S3.
4. Platform remains in S3 until the WLAN card detects an AP with a SSID that is configured for 'Connect automatically". Upon detection, the platform is awoken and application content update occurs.
5. Because a network connection is found, periodic wake is configured and NetDetect disabled.

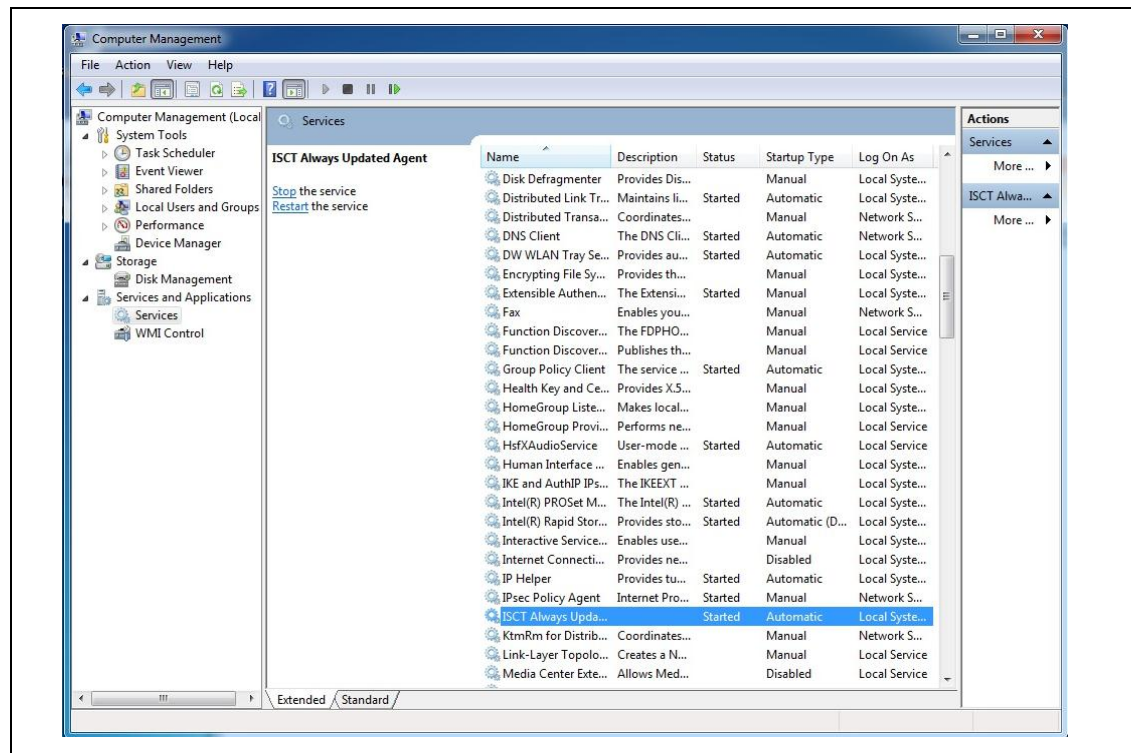
Note: if Intel® Rapid Start Technology is enabled on the platform and active, NetDetect will not be enabled during the extended hours period.



A.6 Configuration Verification and Logging

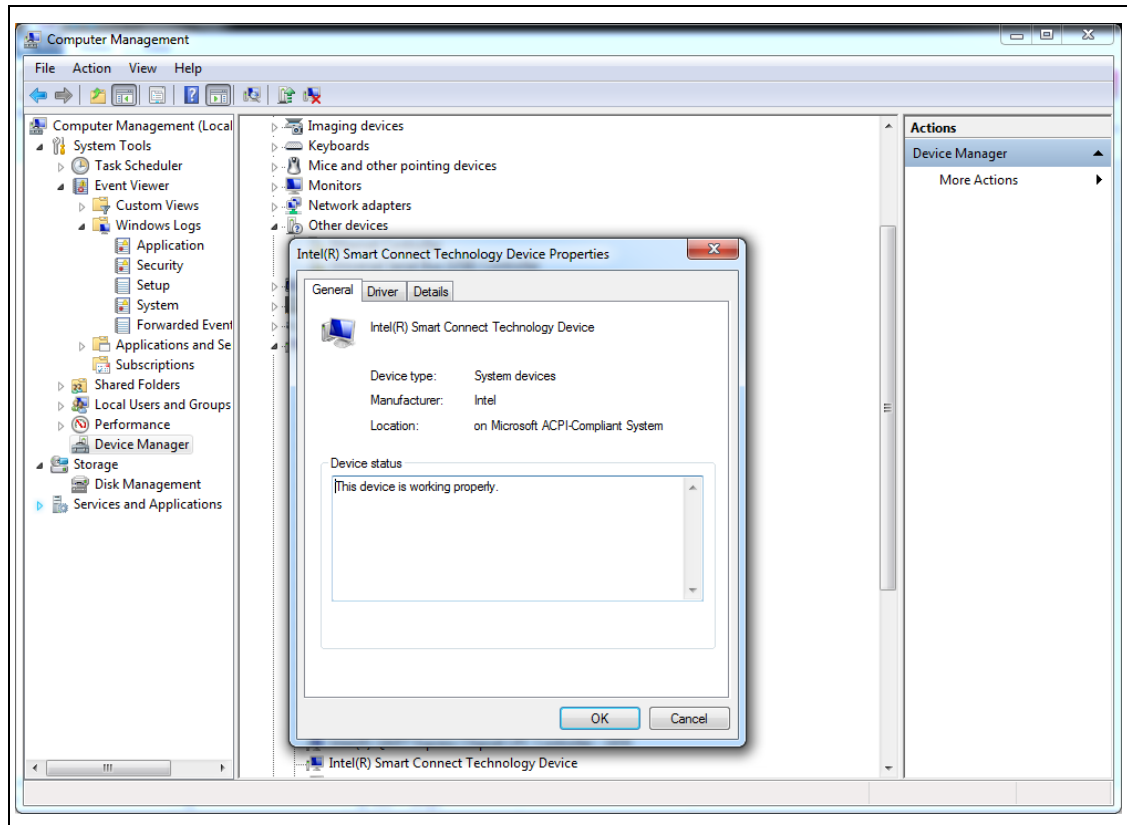
This section contains suggestions on verifying that Intel Smart Connect Technology is correctly configured.

Verify the Intel Smart Connect Technology Agent is started in the Services tab of the Computer Management application.



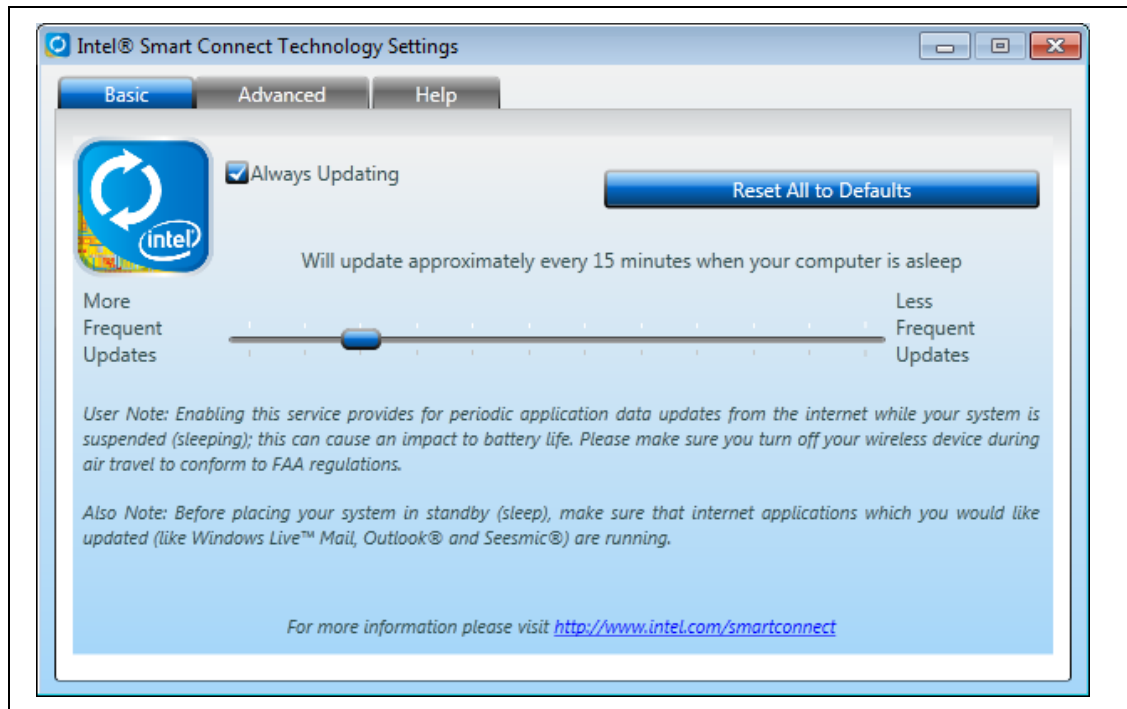


If the Agent is not running ("Started" does not appear in the "Status" column), right-click and select the "Start" operation to start the Agent. If the Agent still does not start, verify that the Intel Smart Connect Technology APCI device appears in the Device Manager as shown below. This indicates to the Agent that Intel Smart Connect Technology is enabled on the platform.

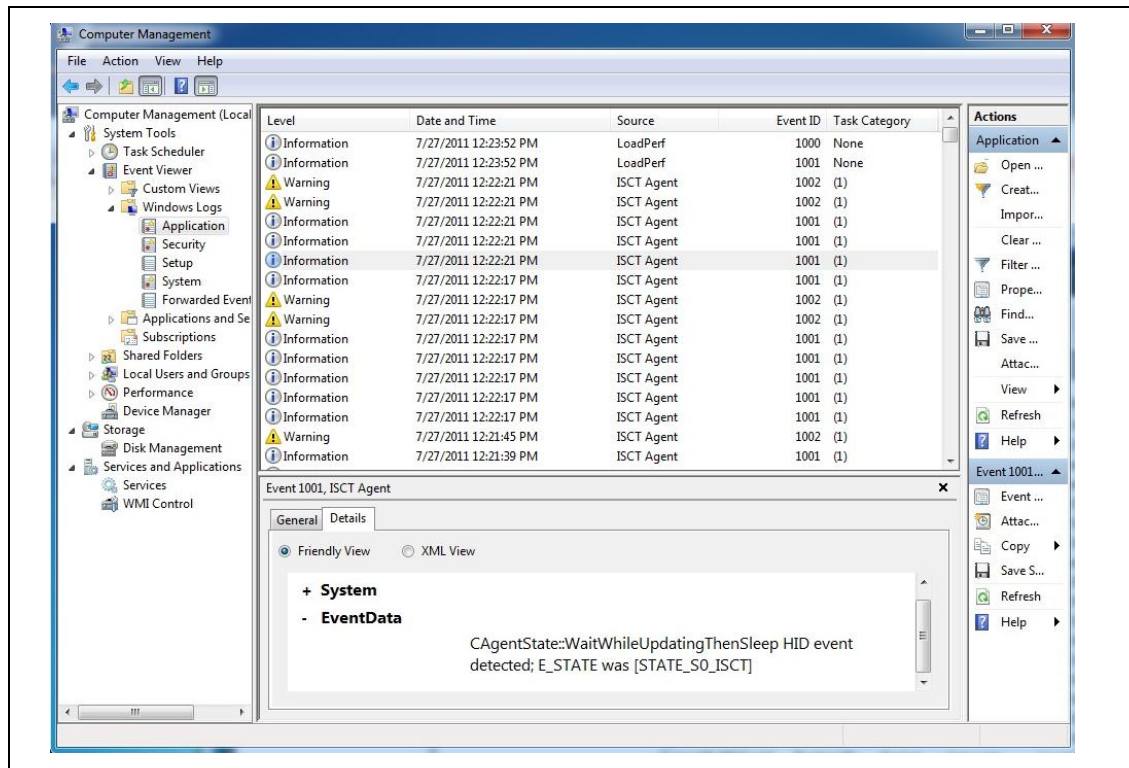


If the device exists but cannot start the Agent or the device is not visible in the Device Manager, the BIOS most likely has a BIOS Setup item that enables Intel Smart Connect Technology on the platform that is not enabled. Restart the platform and enter BIOS Setup and verify that Intel Smart Connect Technology is enabled in the BIOS.

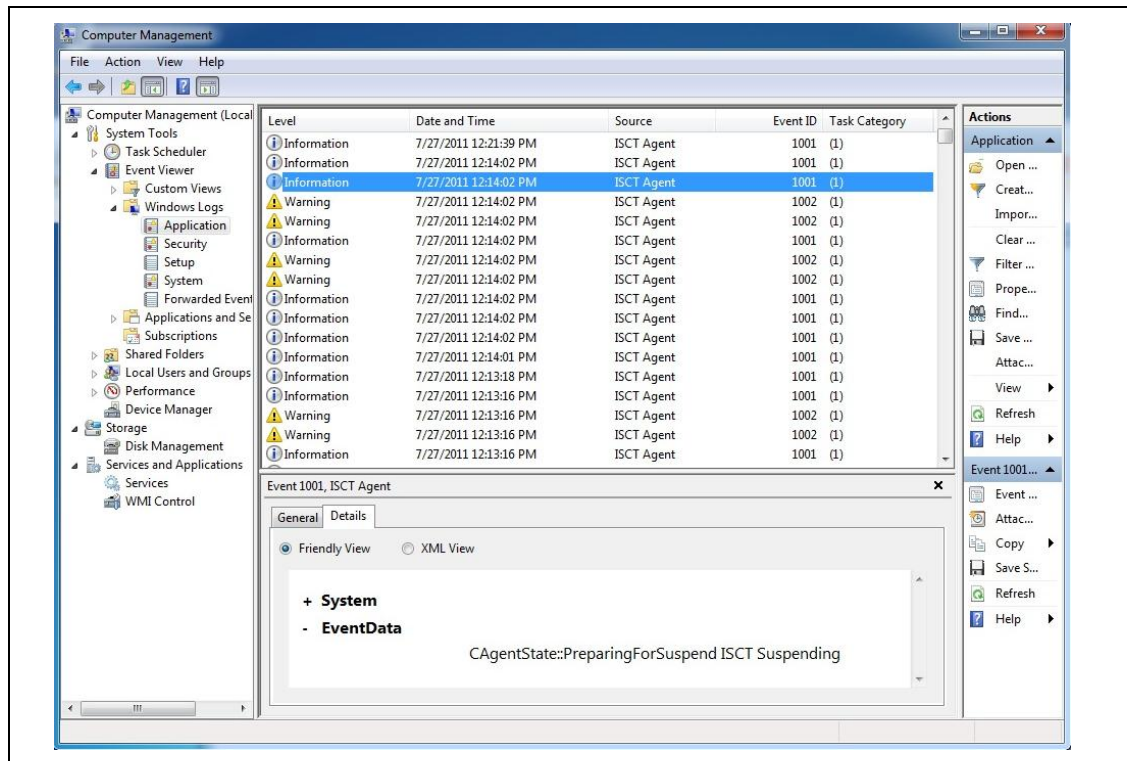
Verify that the Intel Smart Connect Technology Settings application has the "Always Updating" checkbox enabled as illustrated below. If it is not enabled, check the checkbox and the sleep duration control will un-gray if the operation was successful.



If the above two steps are successful and the platform does not wake or only wakes once or the sleep duration is not as expected, verify the following by checking the "Source" column of the Event Viewer Application Log for the Agent entries.

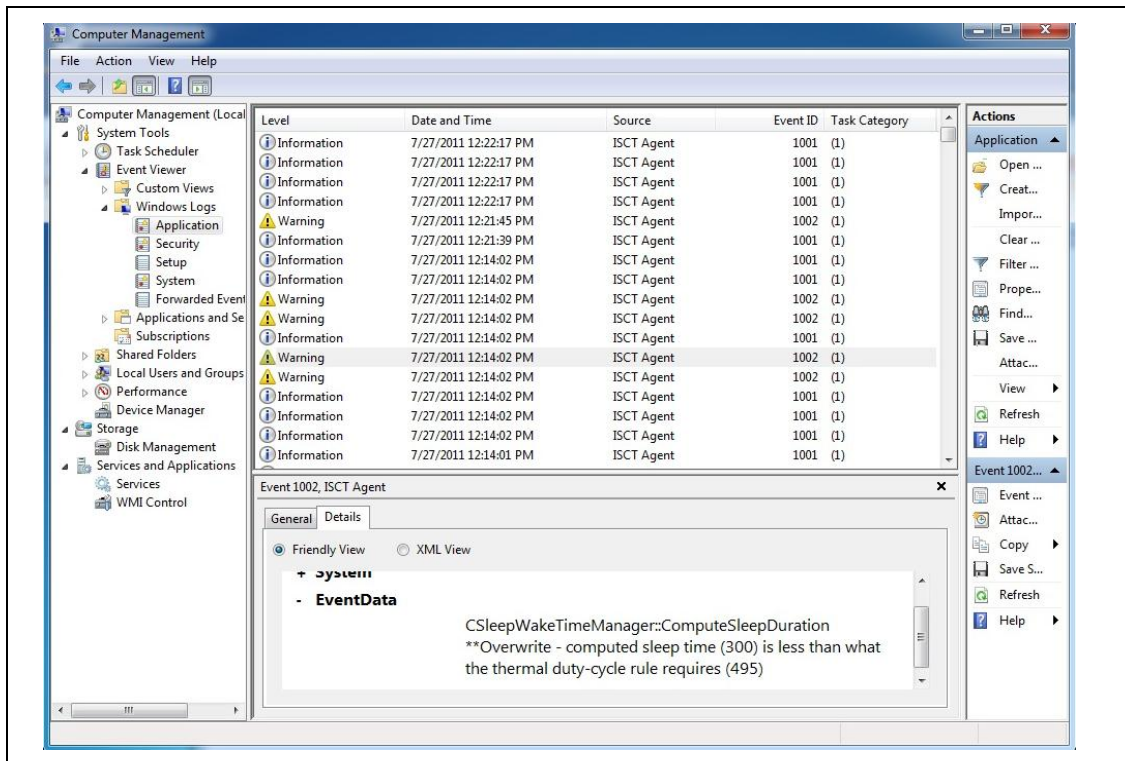


1. Messages about the platform going to S3 with periodic wake enabled or NetDetect enabled are present.
2. Messages about the platform resuming from S3 for periodic wake or NetDetect are present.



If you never see a wake after enabling “Always Updating” in the settings application, verify that one of the applications that would gather data from the Internet is running prior to placing the platform into S3. There is a feature that some OEMs implement called “Application Whitelist” that directs the Agent to only enable periodic wake/NetDetect if a particular application is running (e.g. Outlook, Windows Live Mail, ...). The applications are specified in the “Whitelist” registry setting for Intel Smart Connect Technology (Location: [HKEY_LOCAL_MACHINE\SOFTWARE\Intel\Intel Smart Connect Technology\OEM]).

If the observed sleep duration is greater than the value set in the settings application, the reason is that the Agent takes into consideration battery life, previous wake duration, thermal conditions and duty cycle for the actual sleep time used. Duty cycle is a rule that the Agent uses to preserve battery life and prevent thermal issues during S0-ISCT mode if the battery (> 90%) and thermals are normal.

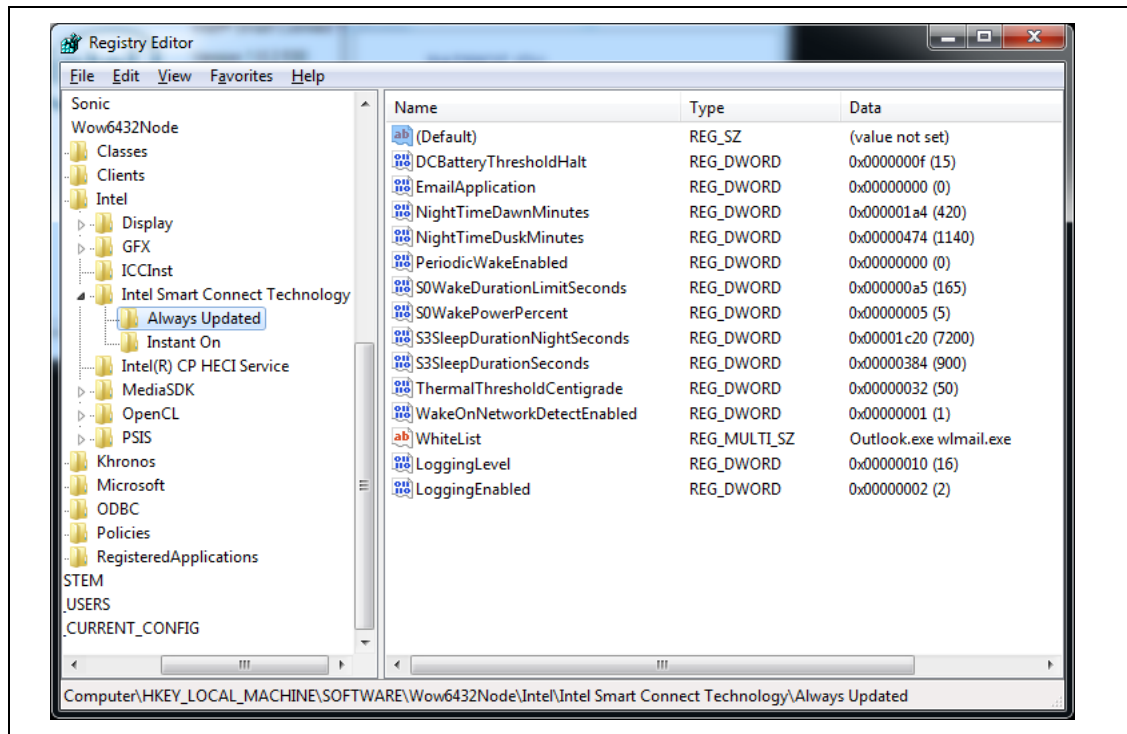


A.6.1 Enabling Additional Logging

The Event Viewer provides logging information about Intel Smart Connect Technology Agent. An alternative to the Event Viewer for logging information is the log files that are created in the C:\ProgramData\Intel\iSCT directory. Note that the "C:\ProgramData" directory is hidden.

Additional logging can be enabled by adding two registry entries: (Location: [HKEY_LOCAL_MACHINE\SOFTWARE\Intel\Intel Smart Connect Technology\Always Updated])

- "LoggingLevel" with a DWORD value of 0x10
- "LoggingEnabled" with a DWORD value of 0x2



The platform must be rebooted or the Agent restarted anytime registry settings are changed as the Intel Smart Connect Technology Agent only reads registry settings upon full OS boot.