Dell™ Latitude™ E6430 notebook

with Intel® Responsiveness Technologies stayed updated in sleep mode, woke faster than a previous generation Latitude notebook,

and kept 99% of battery life, even after sleeping 63 hours.

It's Monday morning and you're flying for work. You've just settled into your seat and taken out your notebook, ready to catch up on email. There's just one problem—you worked on your home desktop over the weekend and haven't touched your notebook since Friday, so your email is three days out of date. Wait, there's another problem—your battery is less than half-charged and unlikely to last through your flight. Now you'll get behind on your work and have to suffer through the inflight movie.

That's how it used to be. With the new Dell Latitude E6430, which includes two key new Intel management features, your email can be current from the time you leave home and your battery can be almost fully charged. Thanks to Intel Smart Connect Technology (ISCT), your system has periodically awakened from the Windows® sleep state to refresh email, social networking applications, and file-sharing programs such as Dropbox. Thanks to Intel Rapid Start Technology™ (IRST), the Dell Latitude E6430 consumed lower levels of power when you weren't using it, and resumed quickly when you were ready to start work.

Principled Technologies (PT) tested a Dell Latitude E6430 and an older notebook without these new Intel features. We found that ISCT reduced by up to 95.3 percent the amount of time it took the notebooks to be updated and IRST boosted the amount of battery life after a weekend of Sleep mode by as much as 90.4 percent.

STAY CONNECTED AND DON'T RUN OUT OF JUICE

The Dell Latitude E6430 uses two new Intel technologies to greatly enhance your notebook experience.
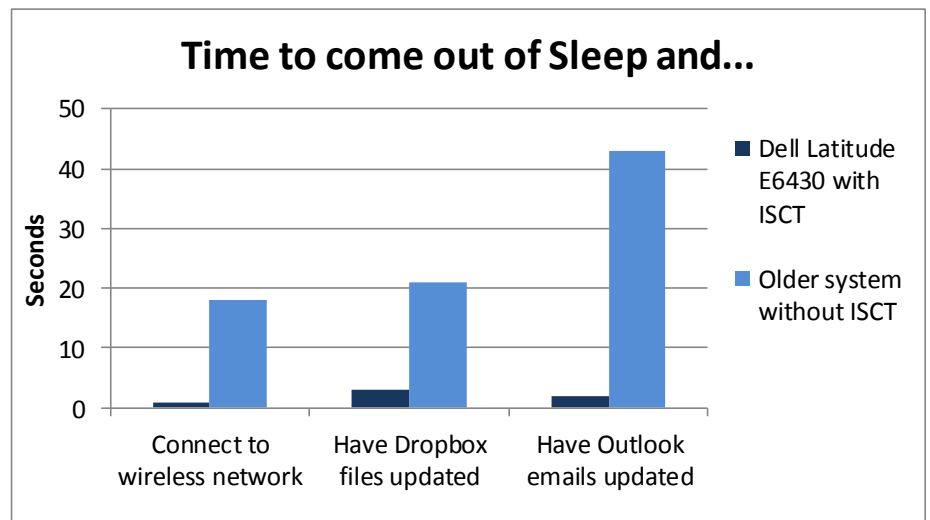
- **Intel Smart Connect Technology.** ISCT periodically wakes the Latitude from the Windows® sleep state to refresh email and other applications. The Dell Latitude E6430 detects the presence of known wireless networks while asleep, waking only when connectivity is available. ISCT can also provide quick Internet connection readiness by keeping wireless devices active in a low-power saving mode.

- **Intel Rapid Start Technology.** IRST provides power savings similar to the Windows® hibernate state, while letting you start back up your Latitude in half the time of hibernation. IRST also reduces power consumption when the notebook isn't in use, which translates to longer battery life.

The Dell Latitude E6430 draws on these two features to help reduce power consumption while still keeping email and other application data current.

We tested two notebook systems, the Dell Latitude E6430 with both these technologies and an older Dell Latitude E6420 with neither of them, on a variety of everyday tasks. (For detailed configuration information on the two systems, see Appendix A. For a detailed description of the tests we conducted, see Appendix B.)
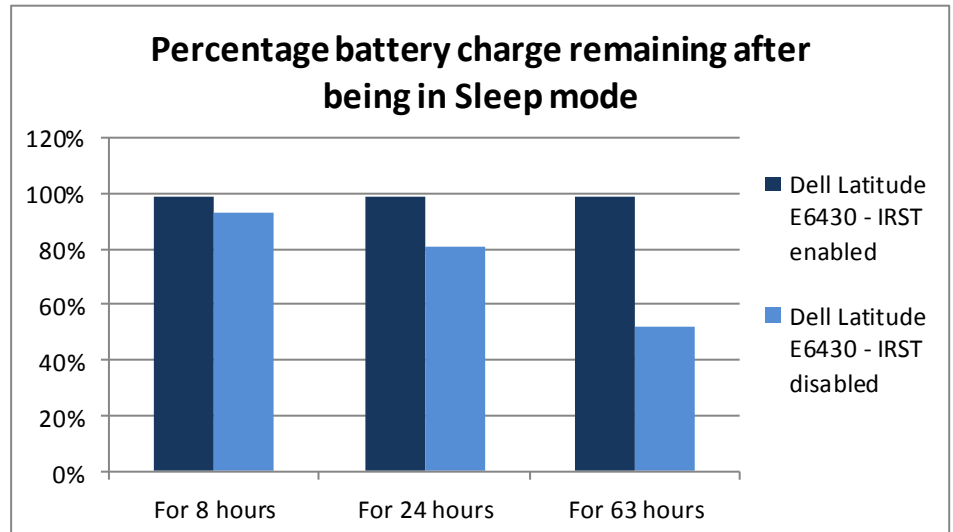
Because Intel Smart Connect Technology quietly wakes up the Latitude every so often to check for updates, when you sit down to work, you can open your notebook and jump right in with little to no wait time. Figure 1 shows the results of our testing. While the older notebook system needed more than 40 seconds to update Outlook, the Dell Latitude E6430 was synchronized and ready to go in only 2 seconds.

Figure 1: The Dell Latitude E6430 with Intel Smart Connect Technology lets you get to work in a fraction of the time that the older system needs. iSCT enabled the Dell Latitude E6430 to perform basic tasks in as little as 4.7 percent of the time it took the older system without ISCT. Lower numbers are better.

Time to come out of Sleep and...

Dell Latitude notebook responsiveness and battery life: Effects of Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report 2

Intel Rapid Start Technology lets you start your system more quickly than resuming from hibernation, and works to keep your battery charged. To measure the effect of IRST, we tested the Dell Latitude E6430 two ways: with the feature enabled and with it disabled. As Figure 2 shows, after sleeping for 63 hours (from 5 PM Friday to 8 AM Monday), the battery life with IRST disabled dropped to 52 percent, while it remained almost fully charged at 99 percent with IRST enbabled.

Figure 2: The Dell Latitude E6430 with Intel Rapid Start Technology enabled drained the battery dramatically less than when we disabled with IRST. Higher numbers are better.

Percentage battery charge remaining after being in Sleep mode

WHAT WE FOUND

Figures 3 and 4 present detailed test results. We conducted each test three times and report the median run.

Time to come out of Sleep mode and…	Dell Latitude E6430 with Intel Smart Connect Technology	Older system without Intel Smart Connect Technology	Percentage time saved with Intel Smart Connect Technology
Connect to wireless network	1	18	94.4%
Have Dropbox files updated	3	21	85.7%
Have Outlook emails updated	2	43	95.3%

Figure 3: Time, in seconds, the two notebook systems needed to connect and update upon exiting Sleep mode. Smaller numbers, except for percentage time saved, are better.

Percentage battery charge remaining after being in Sleep mode for…	Dell Latitude E6430 Intel Rapid Start Technology enabled	Dell Latitude E6430 Intel Rapid Start Technology disabled	Percentage time saved with Intel Rapid Start Technology
For 8 hours	99%	93%	6.5%
For 24 hours	99%	81%	22.2%
For 63 hours (5 PM Friday to 8 AM Monday)	99%	52%	90.4%

Figure 4: The battery charge remaining upon exiting Sleep mode. Higher numbers are better.

Dell Latitude notebook responsiveness and battery life: Effects of Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report 3

IN CONCLUSION

Opening your notebook to find a drained battery and applications such as email in the same state you left them days ago can be a real hassle and a waste of vital time—especially when you're on the go and a power outlet and reliable Internet connection aren't available. The Dell Latitude E6430 uses new technologies from Intel to help you avoid this scenario by making sure your notebook is ready to work when you are.

We found that the new Dell Latitude E6430 using Intel Smart Connect Technology came out of Sleep mode and updated files in as little as two or three seconds, 4.7 percent of the time it took an older system without the technology. With Intel Rapid Start Technology, the Dell Latitude E6430 kept its battery nearly fully charged, even after spending a weekend in Sleep mode, while the system's battery drained to 52 percent when we disabled IRST.

In our tests, the Dell Latitude E6430 notebook with Intel Smart Connect and Intel Rapid Start technologies delivered quickly updated applications and a well-charged battery so you can work on the go.

Dell Latitude notebook responsiveness and battery life: Effects of Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report 4

APPENDIX A – SYSTEM CONFIGURATION INFORMATION

Figure 5 provides detailed configuration information for the test systems.

System	Dell Latitude E6430	Dell Latitude E6420
General		
Number of processor packages	1	1
Number of cores per processor	2	2
Number of hardware threads per core	2	2
System power management policy	Dell	Dell
Processor power-saving option	Enhanced Intel SpeedStep® Technology	Enhanced Intel SpeedStep® Technology
System dimensions (length x width x height)	14-7/8" x 9-1/2" x 1-3/8"	13-7/8" x 9-1/2" x 1-3/16"
System weight	5 lbs. 4 oz.	5 lbs. 7 oz.
CPU		
Vendor	Intel	Intel
Name	Core i7	Core i5
Model number	3520M	2520M
Stepping	E1	D2
Socket type	Socket 988B rPGA	Socket 988B rPGA
Core frequency (GHz)	2.90	2.50
L1 cache	32 KB + 32 KB (per core)	32 KB + 32 KB (per core)
L2 cache	512 KB (256 KB per core)	512 KB (256 KB per core)
L3 cache	4 MB	3 MB
Platform		
Vendor and model number	Dell Latitude E6430	Dell Latitude E6420
Motherboard model number	0H3MT5	032T9K
BIOS name and version	Intel QM77	Intel QM67
BIOS settings	Dell A02 (04/24/2012)	Dell A05 (05/24/2011)
Memory module(s)		
Vendor and model number	Hyundai HMT351S6CFR8C-PB	Samsung M471B5273DH0-CH9
Type	PC3-12800	PC3-10600
Speed (MHz)	1,600	1,333
Speed running in the system (MHz)	1,600	1,333
Timing/Latency (tCL-tRCD-tRP-tRASmin)	11-11-11-28	9-9-9-24
Size (MB)	4,096	4,096
Number of memory module(s)	2	1
Chip organization (single-sided/double-sided)	Double-sided	Double-sided
Channel (single/dual)	Dual	Single
Hard disk		
Vendor and model number	Samsung PM830	Seagate ST320LT007-9ZV142
Number of disks in system	1	1

Dell Latitude notebook responsiveness and battery life: Effects of Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report **5**

System	Dell Latitude E6430	Dell Latitude E6420
Size (GB)	128	320
Buffer size (MB)	N/A	16
RPM	N/A	7,200
Type	SSD 6.0 Gb/s	SATA 3.0 Gb/s
Controller	Intel Mobile Express Chipset SATA RAID Controller	Intel Mobile Express Chipset SATA RAID Controller
Driver	Intel 11.0.0.1032 (11/29/2011)	Intel 10.1.0.1008 (11/06/2010)
Operating system		
Name	Windows 7 Professional x64	Windows 7 Professional x64
Build number	7601	7600
Service pack	1	1
File system	NTFS	NTFS
Kernel	ACPI x64-based PC	ACPI x64-based PC
Language	English	English
Microsoft DirectX version	DirectX 11	DirectX 11
Graphics		
Vendor and model number	NVIDIA NVS 5200M	NVIDIA NVS 4200M
Type	Discrete	Discrete
Chipset	NVS 5200M	NVIDIA NVS 4200M
BIOS version	70.8.a8.0.13	75.19.17.01.01
Total available graphics memory (MB)	4,095	2,244
Dedicated video memory (MB)	1,024	512
System video memory (MB)	0	0
Shared system memory (MB)	3,071	1,732
Resolution	1,366 x 768 x 32-bit	1,366 x 768 x 32-bit
Driver	NVIDIA 8.17.12.9679 (05/10/2012)	NVIDIA 8.17.12.6883 (06/05/2011)
Sound card/subsystem		
Vendor and model number	NVIDIA High Definition Audio	IDT High Definition Audio
Driver	NVIDIA 1.3.12.0 (01/17/2012)	IDT 6.10.0.6324 (01/25/2011)
Ethernet		
Vendor and model number	Intel 82579LM Gigabit	Intel 82579LM Gigabit
Driver	Intel 11.15.12.0 (11/30/2011)	Intel 11.8.81.0 (10/28/2010)
Wireless		
Vendor and model number	Intel Centrino® Ultimate-N 6300	Intel Centrino Advanced-N 6205
Driver	Intel 15.1.1.1 (03/12/2012)	Intel 14.0.1.2 (12/21/2010)
Optical drive(s)		
Vendor and model number	Matshita UJ8B2	TSSTcorp TS-U633J
Type	DVD-RW	DVD-RW
USB ports		
Number	4	4
Type	1 x USB 2.0, 1 x USB2.0/eSATA, 2 x USB 3.0	3 x USB 2.0, 1 x USB 2.0/eSATA
Other	Media card reader	Media card reader

Dell Latitude notebook responsiveness and battery life: Effects of Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report 6

System	Dell Latitude E6430	Dell Latitude E6420
Monitor		
LCD type	HD LED WXGA	HD LED WXGA
Screen size	14"	14"
Refresh rate	60 Hz	60 Hz
Battery		
Type	Dell T54FJ	Dell T54FJ
Size (length x width x height)	8-1/4" x 2" x 13/16"	8-1/4" x 2" x 13/16"
Rated capacity	5300mAh / 11.1V (60Wh)	5300mAh / 11.1V (60Wh)
Weight	11 oz.	11 oz.

Figure 5: System configuration information for the test systems.

Dell Latitude notebook responsiveness and battery life: Effects of
Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report **7**

APPENDIX B - HOW WE TESTED

Testing Intel Rapid Start Technology- Battery life

IRST enabled - Sleep

1. Using the Intel Rapid Start Technology Manager application, set the iRST timer to 0 minutes.
2. Charge the battery to 100%.
3. Boot the system and bring up an administrative command prompt:
   a. Select Windows Start orb.
   b. Type `cmd` and right-click cmd.exe.
   c. Select Run as administrator.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
5. Do not interact with the system until the command completes.
6. After the command completes, wait 5 minutes before running the test.
7. Unplug the system.
8. Simultaneously start the timer and put the system into sleep mode (Start→Sleep).
9. Stop the timer when the power LED starts to blink.
10. Record the result as the sleep time.
11. Allow the system to sleep for 8, 24, or 63 hours.
12. At the end of test period, press the power button to resume from sleep mode.
13. Record the battery percentage.

Testing Intel Smart Connect Technology

ISCT – Connecting to a network from Sleep

1. Using the Intel Smart Connect Technology Configuration application, set the iSCT feature to update every 5 minutes.
2. Charge the battery to 100%.
3. Boot the system and bring up an administrative command prompt:
   a. Select Windows Start orb.
   b. Type `cmd` and right-click cmd.exe.
   c. Select Run as administrator.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
5. Do not interact with the system until the command completes.
6. After the command completes, wait 5 minutes before running the test.
7. Unplug the system.
8. Put the system into sleep mode (Start→Sleep), and allow it to sleep for 30 minutes.
9. At the end of 30 minutes, simultaneously start the timer and press the power button to resume from sleep mode.
10. Stop the timer when the system reconnects to the wireless network, as displayed by the Intel PROSet/Wireless icon located in the taskbar.
11. Shut down the system, repeat steps 1 through 9 two more times, and report the median of the three runs.

ISCT – Connecting to Microsoft Outlook from Sleep

1. Using the Intel Smart Connect Technology Configuration application, set the iSCT feature to update every 5 minutes.
2. Charge the battery to 100%.
3. Boot the system and bring up an administrative command prompt:
   a. Select Windows Start orb.

Dell Latitude notebook responsiveness and battery life: Effects of Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report 8

b. Type `cmd` and right-click cmd.exe.
c. Select Run as administrator.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
5. Do not interact with the system until the command completes.
6. After the command completes, wait 5 minutes before running the test.
7. Unplug the system.
8. Open and log into Microsoft Outlook 2010.
9. Leaving the Microsoft Outlook application open, put the system into sleep mode (Start→Sleep), and allow it to sleep for 30 minutes. During this time, on a separate system, send emails to the test system at the following intervals: immediately, 5 minutes, 10 minutes, 15 minutes, 20 minutes.
10. At the end of 30 minutes, simultaneously start the timer and press the power button to resume from sleep mode.
11. Stop the timer when the test emails appear. Note if the test system's email has been updated while the system was in sleep mode.
12. Shut down the system, repeat steps 1 through 9 two more times, and report the median of the three runs.

ISCT – Connecting to Dropbox from Sleep

1. Using the Intel Smart Connect Technology Configuration application, set the iSCT feature to update every 5 minutes.
2. Charge the battery to 100%.
3. Boot the system and bring up an administrative command prompt:
    a. Select Windows Start orb.
    b. Type `cmd` and right-click cmd.exe.
    c. Select Run as administrator.
4. Type `Cmd.exe /c start /wait Rundll32.exe advapi32.dll,ProcessIdleTasks`
5. Do not interact with the system until the command completes.
6. After the command completes, wait 5 minutes before running the test.
7. Unplug the system.
8. Open Dropbox and sign into the Dropbox account.
9. Leaving the Dropbox application open, put the system into sleep mode (Start→Sleep), and allow it to sleep for 30 minutes. During this time, on a separate system, upload eight files to the Dropbox account: 1 doc, 2 docx, 1 xls, 1 xlsx, 1 ppt, 1 pptx, and 1 pdf.
10. At the end of 30 minutes, simultaneously start the timer and press the power button to resume from sleep mode.
11. Stop the timer when the Dropbox files appear. Note if the test system's Dropbox account has been updated while the system was in sleep mode.
12. Shut down the system, repeat steps 1 through 9 two more times, and report the median of the three runs.

Dell Latitude notebook responsiveness and battery life: Effects of Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report **9**

ABOUT PRINCIPLED TECHNOLOGIES

Principled Technologies, Inc.
1007 Slater Road, Suite 300
Durham, NC, 27703
www.principledtechnologies.com

We provide industry-leading technology assessment and fact-based marketing services. We bring to every assignment extensive experience with and expertise in all aspects of technology testing and analysis, from researching new technologies, to developing new methodologies, to testing with existing and new tools.

When the assessment is complete, we know how to present the results to a broad range of target audiences. We provide our clients with the materials they need, from market-focused data to use in their own collateral to custom sales aids, such as test reports, performance assessments, and white papers. Every document reflects the results of our trusted independent analysis.

We provide customized services that focus on our clients' individual requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to help our clients assess how it will fare against its competition, its performance, its market readiness, and its quality and reliability.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for over 20 years. As journalists, they published over a thousand articles on a wide array of technology subjects. They created and led the Ziff-Davis Benchmark Operation, which developed such industry-standard benchmarks as Ziff Davis Media's Winstone and WebBench. They founded and led eTesting Labs, and after the acquisition of that company by Lionbridge Technologies were the head and CTO of VeriTest.

Dell Latitude notebook responsiveness and battery life: Effects of Intel Rapid Start Technology and Intel Smart Connect Technology

A Principled Technologies test report   10