



Surface

Best practices for Surface configuration and deployment



Workshop objectives

During this workshop we'll cover:

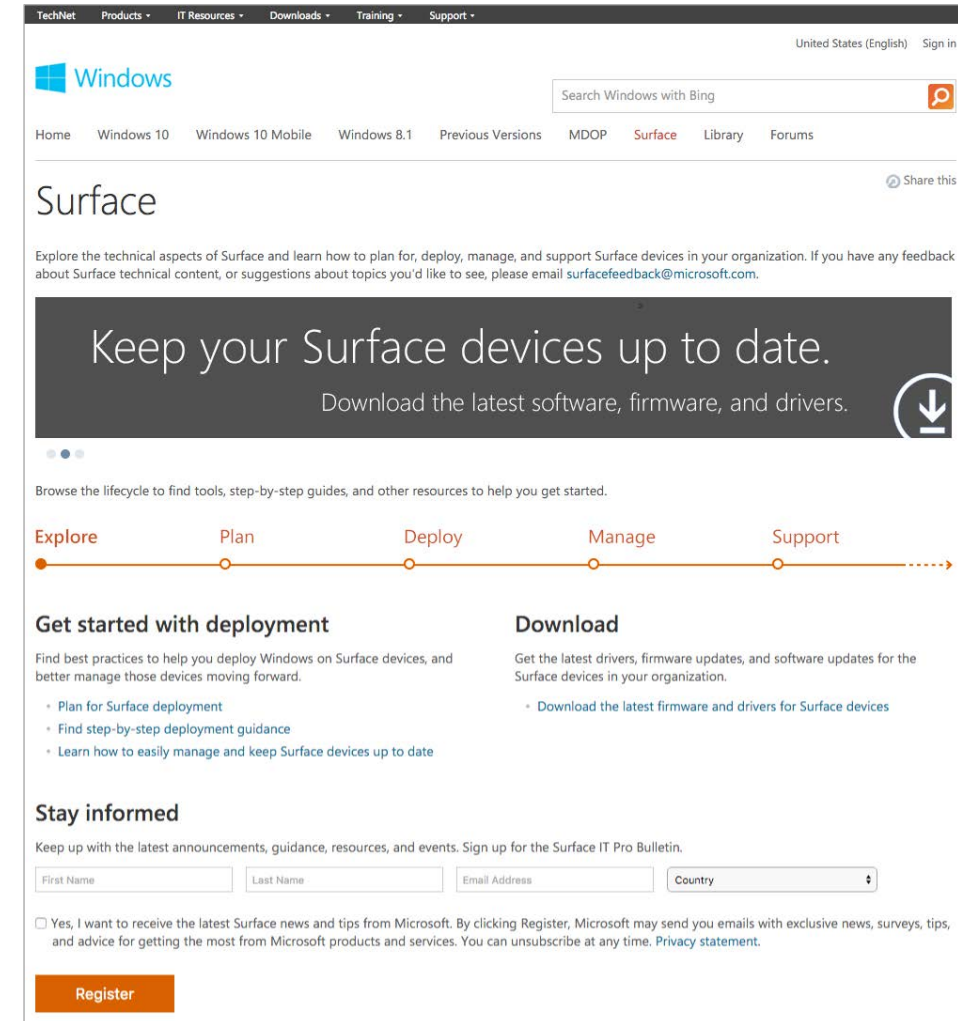
- Device operation
- UEFI
- Power
- Video scaling and external monitors
- Configuration tools
- Support process and troubleshooting tips



Your best technical starting point

Surface TechCenter on TechNet:

<http://aka.ms/surfacetc>



The screenshot shows the Windows Surface TechCenter page on the TechNet website. The page has a dark header with navigation links: TechNet, Products, IT Resources, Downloads, Training, and Support. The main content area is white with a Windows logo and a search bar. Below the search bar is a navigation menu with links: Home, Windows 10, Windows 10 Mobile, Windows 8.1, Previous Versions, MDOP, Surface (highlighted), Library, and Forums. The main heading is "Surface". Below it is a paragraph explaining the page's purpose and a link to provide feedback. A large dark banner with white text says "Keep your Surface devices up to date. Download the latest software, firmware, and drivers." with a download icon. Below the banner is a horizontal timeline with five stages: Explore, Plan, Deploy, Manage, and Support. The "Explore" stage is currently selected. Below the timeline are two main sections: "Get started with deployment" and "Download". The "Get started with deployment" section includes links for "Plan for Surface deployment", "Find step-by-step deployment guidance", and "Learn how to easily manage and keep Surface devices up to date". The "Download" section includes a link for "Download the latest firmware and drivers for Surface devices". At the bottom, there is a "Stay informed" section with a sign-up form for the Surface IT Pro Bulletin, including fields for First Name, Last Name, Email Address, and Country, and a "Register" button.

Hardware overview

Building Surface Pro 4 and Surface Book (WIN325)

<https://msftignite.com.au/sessions/session-details/1859>

Surface accessories: Surface Type Cover, Surface Pen, and Surface Dock (WIN342)

<https://msftignite.com.au/sessions/session-details/1862>



New UEFI menu

Surface UEFI can be used to:

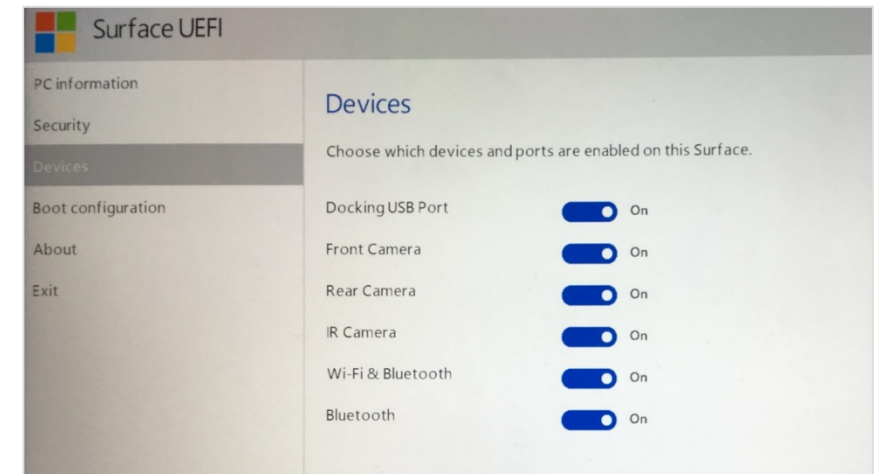
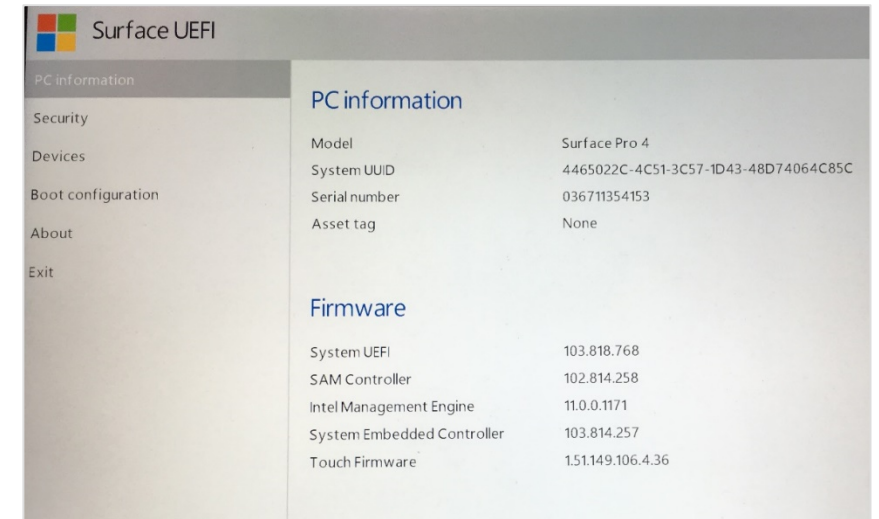
- Review and modify PC information to troubleshoot warranty support
- Set security for the UEFI and Secure Boot
- Turn various connected devices and hardware on or off, such as IR camera, Bluetooth, and WiFi
- Change how Surface starts in Windows

To access Surface UEFI:

1. Turn off the Surface device
2. Press and hold the volume-up button on the Surface, and at the same time, press and release the power button
3. When you see the Surface logo, release the volume-up button

Further reading:

<http://www.microsoft.com/surface/en-us/support/warranty-service-and-recovery/how-to-use-the-bios-uefi-with-surface-book-and-surface-pro-4?os=windows-10#pcWin10>



Deploying Surface

Imaging and deployment >

Keeping firmware and drivers current >

Surface specific apps >

Surface configuration tools >



Deploying Surface

Deployment tools:

- Use tools such as Microsoft Deployment Toolkit (MDT) and System Center Configuration Manager 2012 R2.
- Use MDT to create reference image, and then import it into ConfigMgr.

Best practices:

- Use Hyper-V Generation 1 virtual machine as reference image
- Use selection profiles or other methods to control driver installation so that only drivers designed for Surface are deployed to the device.
- From the Surface Driver Download page, use the appropriate .zip driver collection for imaging.
- Use the appropriate .msi file to update devices every month

Drivers and firmware

Contains drivers, firmware, tools, and updates

Firmware

 EC	4/23/2015 3:25 PM	File folder
 SAM	4/23/2015 3:25 PM	File folder
 TOUCH	4/23/2015 3:25 PM	File folder
 UEFI	4/23/2015 3:25 PM	File folder

Drivers

 Accessory	4/23/2015 3:25 PM	File folder
 Audio	4/23/2015 3:25 PM	File folder
 Camera	4/23/2015 3:25 PM	File folder
 Display	4/23/2015 3:25 PM	File folder
 Network	4/23/2015 3:25 PM	File folder
 Pen	4/23/2015 3:25 PM	File folder
 System	4/23/2015 3:25 PM	File folder

Download latest firmware and drivers for your device:

<https://technet.microsoft.com/library/mt210833.aspx>

Surface Pro 4 Drivers and Firmware

Language: English

Download

All current software, firmware, and drivers for the Surface Pro 4; including optional WinTab drivers.

Details

Note: There are multiple files available for this download. Once you click on the "Download" button, you will be prompted to select the files you need.

Version:	Date Published:
1.0	1/4/2016
File Name:	File Size:
SurfacePro4_Win10_151216_0.msi	184.9 MB
SurfacePro4_Win10_151216_0.zip	453.2 MB
Wintab_x32_1.0.0.20.zip	4.5 MB
Wintab_x64_1.0.0.20.zip	4.5 MB

Cumulative and current firmware and drivers for the Surface Pro 4. This firmware and driver package contains drivers for all of the components in the Surface Pro 4, as well as updates to the system firmware that have been released via Windows Update. These drivers and firmware are compatible with Windows 10, including Enterprise versions. The driver MSI and ZIP files include all of the drivers and firmware needed to deploy custom images of Windows on your Surface devices. Additionally, the WinTab driver is provided for those professionals needing WinTab compatibility with certain Surface Pen enabled applications.

+ System Requirements

+ Install Instructions

Updating firmware

Use Microsoft Windows Installer package (MSI) to update Surface devices.

- Supports Quiet/Unattended installation
- Utilizes DPINST for driver installation
- Appears in Add/Remove programs
- Validates battery charge (>45%)
- Supports SCCM and Intune

Note: WSUS is not supported.

Asset Tag utility

Surface Pro 3 firmware tools:

- UEFI options: is managed through .Net assembly
- Can we controlled via PowerShell or any custom app
- UEFI: v3.11.760.0+

Command line tool:

- Acceptable characters: A–Z, a–z, 0–9, period (.) and hyphen (-)
- UEFI: 3.9.150.0+

Further reading:

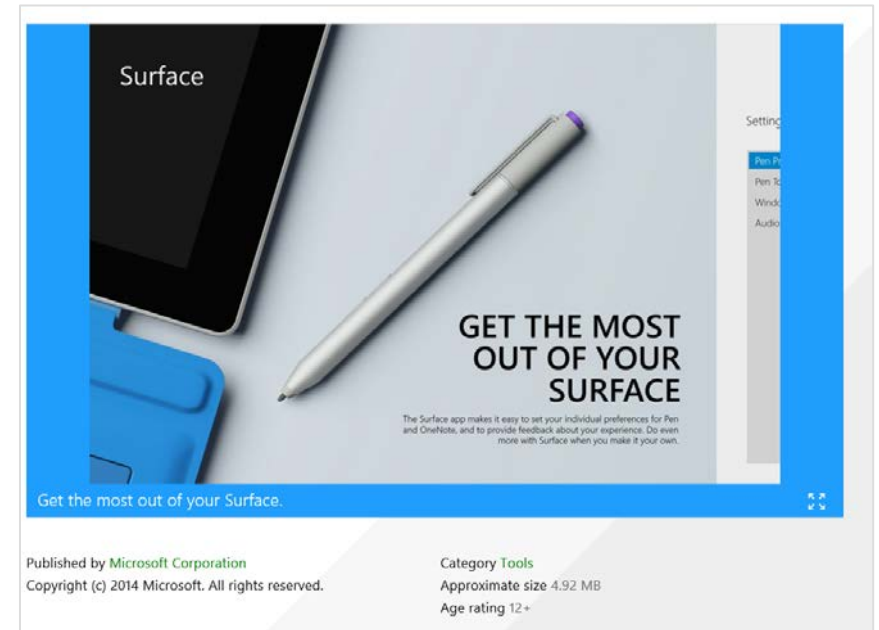
<http://blogs.technet.com/b/askcore/archive/2014/10/20/asset-tag-tool-for-surface-pro-3.aspx>

Surface-specific apps

- .appx packages available now
- Surface App
- Surface Pen settings
- Arc Touch Mouse Surface Edition
- Arc Touch Mouse Surface Edition settings
- Guidance: Install during Surface deployment, do not include in reference images

Further reading:

<https://technet.microsoft.com/en-us/library/mt210837.aspx>



PXE boot

Surface Pro 3 Class 3 UEFI

In order to support PXE boot on UEFI devices, use a Microsoft-provided Ethernet adapter (dock or dongle), and follow the guidelines below.

Windows Deployment Services (WDS):

- Recommend Windows Server 2008 R2 or later

DHCP Scope Options 66/67

- Will not work with mix of BIOS and UEFI systems
- Must use IP Helper table entries

Further reading:

<https://technet.microsoft.com/en-us/library/mt210834.aspx>

Surface configuration tools

Surface-specific configuration tools:

- Accelerate Surface pilot deployments

<http://aka.ms/sda>

- Learn how to wipe data on Surface devices

<https://technet.microsoft.com/en-us/library/mt605308.aspx>

- Learn about Surface App

<https://technet.microsoft.com/en-us/library/mt210835.aspx>

- Install the Arc Touch Mouse app

<https://technet.microsoft.com/en-us/library/mt210836.aspx>

- Enable PEAP, EAP-FAST, and Cisco LEAP protocols on Surface

<https://technet.microsoft.com/en-us/library/mt613114.aspx>

Stay informed:

- Sign up for the Surface IT Pro email Bulletin

<http://aka.ms/surfacebulletin>

- Subscribe to the Surface for IT Pros blog

<http://aka.ms/surfaceitblog>

Power management

Best practices >

Powercfg utility >

Optimizing battery life >

Configuring power in images >

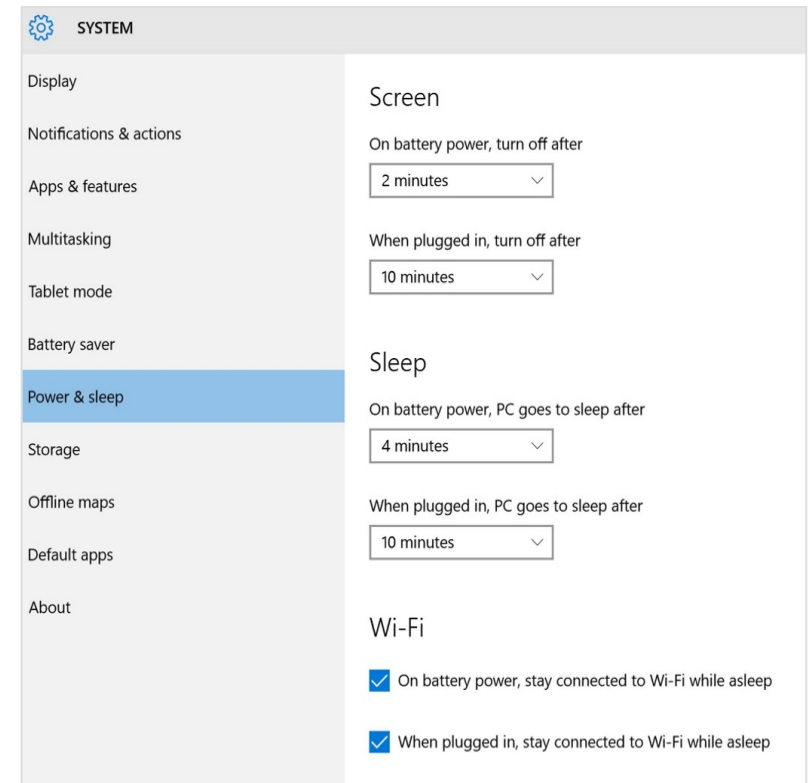
Power reports and analysis >



Power management best practices

- Evaluate your settings and optimizations before simply applying legacy GPOs
- If you create a custom image, re-enable Hibernation.
- Create a Power Plan profile for your image.

Windows 10 battery UI



Windows 10 power management

Power options for Windows 10 are easy to understand and adjust, and include:

- Separate settings for Sleep and Screen
- Hibernate after X setting (wasn't in UI in Win 8.1)
- Hibernate option set using Group Policy

Screen

On battery power, turn off after
5 minutes

When plugged in, turn off after
Never

Sleep

On battery power, PC goes to sleep after
4 minutes

When plugged in, PC goes to sleep after
10 minutes

Power Options

Advanced settings

Select the power plan that you want to customize, and then choose settings that reflect how you want your computer to manage power.

[Change settings that are currently unavailable](#)

Balanced [Active]

Balanced

Require a password on wakeup
On battery: Yes
Plugged in: Yes

Desktop background settings

Sleep

Hibernate after
On battery: 120 Minutes
Plugged in: 120 Minutes

Power buttons and lid

Restore plan defaults

OK Cancel Apply

Power button and lid settings

On battery

When I press the power button: Sleep

When I close the lid: Sleep

When I close the lid: Hibernate

When I close the lid: Shut down

Password protection on wakeup

Powercfg primer

Use from an elevated command prompt:

`powercfg /list`

Lists the power schemes installed. An asterisk denotes the current power scheme.

`powercfg /qh`

Lists all settings including hidden (h).

`powercfg /export sp4.pow GUID`

Exports the power scheme (identified by its GUID) to a file called **sp4.pow**. You'll have to provide the actual GUID.

`powercfg /import sp4.pow GUID`

Imports the power scheme (identified by its GUID) from a file called **sp4.pow**. You'll have to provide the actual GUID.

`Powercfg batteryreport /duration xx`

`Powercfg sleepstudy /duration xx`

`Powercfg energy`

These commands produce diagnostic reports in html format. Duration is specified in minutes, if left blank the default is 10 days. Run this command from a non-system directory so the output file is readable (such as c:\temp), or use add the following switch: `/output %userprofile%\desktop\batteryreport.html`

Optimizing battery life for Surface

Screen brightness is the main contributor to battery use. Ideal setting is 50 percent or lower on DC.

If you apply a custom image, re-enable Hibernate:

REM sets CS battery saver time-out to four hours:

```
powercfg /setdcvalueindex SCHEME_CURRENT 238c9fa8-0aad-41ed-83f4-97be242c8f20 9d7815a6-7ee4-497e-8888-515a05f02364 14400
```

```
powercfg /setacvalueindex SCHEME_CURRENT 238c9fa8-0aad-41ed-83f4-97be242c8f20 9d7815a6-7ee4-497e-8888-515a05f02364 14400
```

```
powercfg /setactive SCHEME_CURRENT
```

Note: the Hibernate GUIDs have changed from Windows 8.1

Disable WiFi in sleep, if you don't need email or live tiles, using following commands :

- `powercfg /set dcvalueindex scheme_current sub_none F15576E8-98B7-4186-B944-EAFA664402D9 0`
- `powercfg /set acvalueindex scheme_current sub_none F15576E8-98B7-4186-B944-EAFA664402D9 0`

Defining power settings for your image

Two methods:

Export/import a power plan from a base machine (easy)

Write a script with powercfg commands

1. On a reference machine, create and configure a new power policy and set it as the active power plan in Control Panel to capture desired settings.
2. To list power schemes, run **powercfg list** from a command prompt.

```
PS C:\temp> powercfg list
Existing Power Schemes (* Active)
-----
Power Scheme GUID: 381b4222-f694-41f0-9685-ff5bb260df2e (Balanced)
Power Scheme GUID: 8c5e7fda-e8bf-4a96-9a85-a6e23a8c635c (High performance)
Power Scheme GUID: a1841308-3541-4f6b-b981-5385391450d0 (Battery power)
```

The active power scheme has an asterisk—note the “GUID” for the next step.

3. Export the Surface Pro 4 power scheme using the command **powercfg.exe /export sp4.pow GUID**. This exports the power scheme (identified by its GUID) to a file called **sp4.pow**.
4. When imaging a new device, you can add a step to the task sequence to import the power plan to the device: **powercfg.exe /import sp4.pow GUID**

Use the GUID option to preserve the GUID throughout the export and import process.

Note: This process applies to Surface 3, Surface Pro 3, Surface Pro 4, and Surface Book

Battery report

Powercfg/batteryreport

Battery life estimates
Battery life estimates based on observed drains

PERIOD	AT FULL CHARGE		AT DESIGN CAPACITY	
	ACTIVE	CONNECTED STANDBY	ACTIVE	CONNECTED STANDBY
2015-10-07 - 2015-10-14	11:59:50	-	11:06:08	-
2015-10-15	-	-	-	-
2015-10-16	-	-	-	-
2015-10-17	4:36:40	6:53:07 232 % / 16 h	4:18:41	6:26:15 249 % / 16 h
2015-10-18	5:34:29	7:46:31 206 % / 16 h	5:19:01	7:24:57 216 % / 16 h
2015-10-19	5:15:31	6:00:12 267 % / 16 h	5:04:50	5:48:00 276 % / 16 h
2015-10-20	5:15:20	6:29:43 246 % / 16 h	5:07:34	6:20:08 253 % / 16 h
2015-10-21	5:20:19	28:47:53 56 % / 16 h	5:08:33	27:44:24 58 % / 16 h
2015-10-22	3:39:36	38:03:54 42 % / 16 h	3:29:38	36:20:15 44 % / 16 h
2015-10-23	13:06:21	22:14:46 72 % / 16 h	12:37:15	21:25:23 75 % / 16 h
2015-10-24	-	366:03:32 4 % / 16 h	-	364:02:09 4 % / 16 h
2015-10-25	8:35:50	52:13:24 31 % / 16 h	8:42:13	52:52:14 30 % / 16 h
2015-10-26	8:38:31	29:49:20 54 % / 16 h	8:28:23	29:14:23 55 % / 16 h
2015-10-27	-	-	-	-

Current estimate of battery life based on all observed drains since OS install

Since OS install	5:00:37	10:32:05 152 % / 16 h	4:49:34	10:08:52 158 % / 16 h
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Provides a summary of battery life while active and on standby.

Shows whether battery is charging to full capacity.

16:42:54	Active	AC	100 %	39,577 mWh
17:17:00	Connected standby	AC	100 %	39,577 mWh
17:17:03	Connected standby	Battery	100 %	39,562 mWh
17:17:04	Active	Battery	100 %	39,562 mWh
17:17:09	Connected standby	Battery	100 %	39,562 mWh
17:17:10	Active	Battery	100 %	39,562 mWh
17:17:11	Connected standby	Battery	100 %	39,562 mWh
17:17:50	Active	Battery	100 %	39,562 mWh
17:22:37	Connected standby	Battery	100 %	39,562 mWh
18:55:02	Active	Battery	92 %	36,517 mWh
19:55:07	Connected standby	Battery	83 %	32,685 mWh
20:49:10	Active	Battery	81 %	32,047 mWh
21:30:03	Connected standby	Battery	72 %	28,417 mWh
23:35:27	Suspended		68 %	26,970 mWh
2015-10-27 07:34:20	Connected standby	Battery	66 %	26,175 mWh
07:34:20	Connected standby	AC	66 %	26,175 mWh
07:34:20	Active	AC	66 %	26,175 mWh
09:19:38	Active	Battery	100 %	39,487 mWh
09:19:43	Active	AC	100 %	39,525 mWh

Use it to determine whether Hibernate is configured—in this case, it's configured for two hours.

Sleep Study

Powercfg/sleepstudy/duration 7

Use Sleep Study to see which apps and devices are most active during a sleep session. Sleep Study reviews all the sleep sessions longer than 10 minutes and provides you with a report that color codes each session according to its power consumption.

Apps, devices, and services with higher power consumption are highlighted in red or orange in the report, and represent opportunities to extend battery life. Click to drill down and see high drainage apps.



Top Offenders

Top 5 offenders, ranked by active time

NAME	TYPE	% ACTIVE TIME	ACTIVE TIME
USB xHCI Compliant Host Controller (_SB.PCI0.XHC)	Fx Device	79%	3:44:09
Marvell AVASTAR Wireless-AC Network Controller (_SB.PCI0.RP09.PXSX)	Fx Device	79%	3:44:09
Marvell AVASTAR Wireless-AC Network Controller	Networking	79%	3:44:09
BI	Activator	16%	0:45:35
CPU C0 Time	Processor	4%	0:11:46

- Activators

- BI

% ACTIVE TIME	ACTIVE TIME
16%	0:45:35

- microsoft.windowscommunicationsapps_17.6310.42251.0_x64_8wekyb3d8bbwe

% ACTIVE TIME	ACTIVE TIME
15%	0:43:16

+ ppleae38af2e007f4358a809ac99a64a67c1

+ Microsoft.Windows.Cortana_1.4.8.176_neutral_neutral_cw5n1h2tyewy

+ Microsoft.Windows.Photos_15.1026.13580.0_x64_8wekyb3d8bbwe

+ microsoft.windowscommunicationsapps_17.6310.42251.0_x64_8wekyb3d8bbwe

Energy report

Powercfg/energy

This is a real-time test tool that analyzes system performance. Default duration is 60 seconds.

With this report, you can determine sources of high CPU utilization and battery drain.

It's best to run the report when the system is idle with no apps running.

USB Suspend:USB Device not Entering Selective Suspend This device did not enter the USB Selective Suspend state. Processor power management may be prevented when this USB device is not in the Selective Suspend state. Note that this issue will not prevent the system from sleeping.	
Device Name	USB Composite Device
Host Controller ID	PCI\VEN_8086&DEV_9D2F
Host Controller Location	PCI bus 0, device 20, function 0
Device ID	USB\VID_0B0E&PID_1042
Port Path	2,1,2
CPU Utilization:Processor utilization is high The average processor utilization during the trace was high. The system will consume less power when the average processor utilization is very low. Review processor utilization for individual processes to determine which applications and services contribute to the high utilization. Average Utilization (%) 11.05	
Warnings	
Platform Timer Resolution:Platform Timer Resolution The default platform timer resolution is 15.6ms (15625000ns) and should be used whenever the system is idle. If the timer resolution is increased, processor power management technologies may not be effective. The timer resolution may be increased to 100ms (100000000ns). Current Timer Resolution (100ns units) 10026 Maximum Timer Period (100ns units) 156250	
Platform Timer Resolution:Outstanding Kernel Timer Request A kernel component or device driver has requested a timer resolution smaller than the platform maximum timer resolution. Requested Period 10000 Request Count 1	
USB Suspend:USB Device Rarely Entering Selective Suspend This device intermittently entered the USB Selective Suspend state during the trace. Processor power management may be prevented when this USB device is not in the Selective Suspend state. Note that this issue will not prevent the system from sleeping.	
Device Name	USB Input Device
Host Controller ID	PCI\VEN_8086&DEV_9D2F
Host Controller Location	PCI bus 0, device 20, function 0
Device ID	USB\VID_045E&PID_07E8
Port Path	7
Time Suspended (%)	45
CPU Utilization:Individual process with significant processor utilization. This process is responsible for a significant portion of the total processor utilization recorded during the trace.	
Process Name	iexplore.exe
PID	3740
Average Utilization (%)	2.44
Module	Average Module Utilization (%)
\SystemRoot\System32\win32kfull.sys	1.08
\SystemRoot\System32\ntoskrnl.exe	0.35
\Device\HarddiskVolume3\Windows\SysWOW64\mshtml.dll	0.21
CPU Utilization:Individual process with significant processor utilization. This process is responsible for a significant portion of the total processor utilization recorded during the trace.	
Process Name	System
PID	4
Average Utilization (%)	1.00
Module	Average Module Utilization (%)
\SystemRoot\System32\hal.dll	0.56
\SystemRoot\System32\ntoskrnl.exe	0.27
\SystemRoot\System32\drivers\mrvlpcie8897.sys	0.04

System event log entries for power

Log Name:	System
Source:	Microsoft-Windows-Kernel-Power
Event ID:	42
Level:	Information
Description:	The system is entering sleep.
Sleep Reason:	Battery

Log Name:	System
Source:	Microsoft-Windows-Kernel-Power
Event ID:	506
Level:	Information
Description:	The system is entering connected standby.
Reason:	Button or Lid

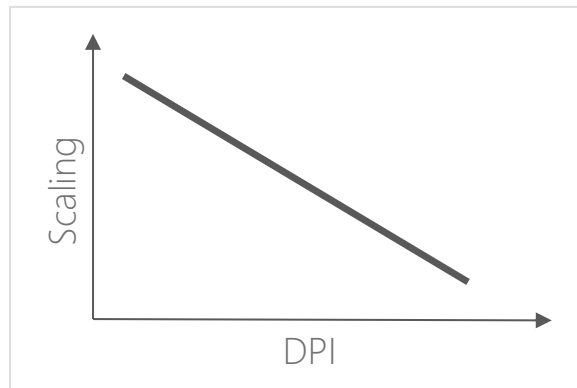
Log Name:	System
Source:	Microsoft-Windows-Kernel-Power
Event ID:	507
Level:	Information
Description:	The system is exiting connected standby.
Reason:	Power Button

Log Name:	System
Source:	Microsoft-Windows-Kernel-Power
Event ID:	507
Level:	Information
Description:	The system is exiting connected standby.
Reason:	User Input

Enhancing video display



Samsung 23" full-HD, Samsung 27" WQHD, Sharp PN-K321 32" Ultra-HD



Display	100% scaling	150% scaling	200% scaling
23" HD, 1920 x 1080	95 DPI	63 DPI	48 DPI
27" WQHD, 2540 x 1440	108 DPI	72 DPI	54 DPI
32" UltraHD, 3840 x 2160	138 DPI	92 DPI	69 DPI
12" SP3, 2160 x 1440	216 DPI	144 DPI	108 DPI

Further reading:

<http://blogs.windows.com/bloggwindows/2013/07/15/windows-8-1-dpi-scaling-enhancements/>

Video scaling and external monitors

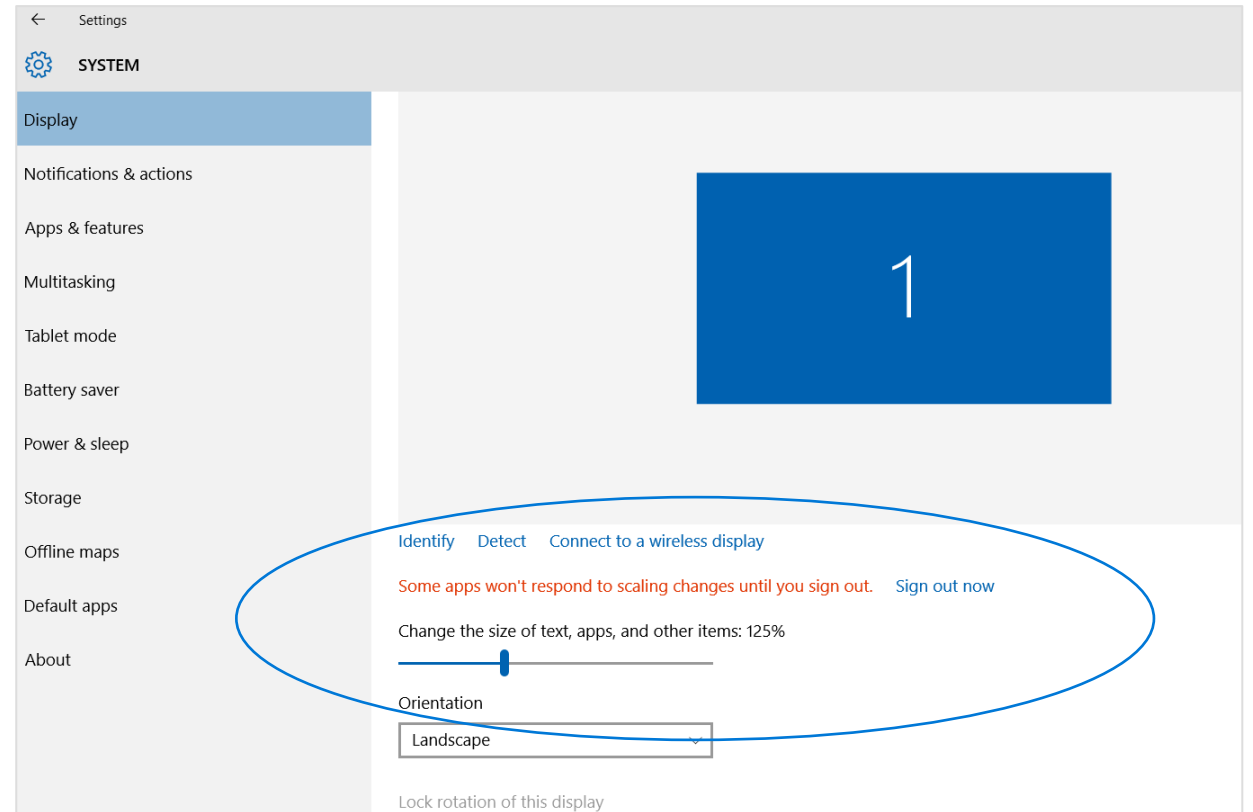
With Windows 10, you can apply a single scale factor across all displays, and Windows will remember your settings when you log on and off.

Experiment with Windows 10 scale factors to:

- Assess how your Win32 apps look
- Determine user recommendations (or let Windows 10 decide for you)
- Educate end users on settings

Further reading:

<http://blogs.technet.com/b/askcore/archive/2015/12/08/display-scaling-in-windows-10.aspx>





Questions





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Understanding the customer environment

Schedule

Target audience

Windows 10 plans

Antivirus

Security agents

Disk encryption

Imaging tools and process

Management tools

Monitors and cables

GPU apps