

TOTAL COST OF OWNERSHIP: SAVE WITH A 2 IN 1 INTEL vPRO ULTRABOOK VS. SEPARATE LAPTOP PLUS TABLET



2 IN 1 INTEL vPRO™ ULTRABOOK™

A SINGLE DEVICE THAT PERFORMS AS BOTH A TABLET AND A LAPTOP

WAS LESS EXPENSIVE FOR ORGANIZATIONS VS. LAPTOP-PLUS-TABLET SOLUTIONS*

\$1,160

THREE-YEAR SAVINGS PER USER
COMPARED TO A LAPTOP
AND APPLE® IPAD®



OR

\$1,268

THREE-YEAR SAVINGS PER USER
COMPARED TO A LAPTOP
AND ANDROID™ TABLET



2 IN 1 BENEFITS

IT'S A
TABLET



◀ AND ▶



IT'S A
LAPTOP

MANAGEABILITY

Manage one vPro device per user, not two

SECURITY

Hardware-assisted security with Intel vPro in both modes

SOFTWARE

Run single instances of software per user

FLEXIBILITY

Workers get the convenience of two devices in one

**Estimated savings over three years for a Lenovo® ThinkPad® Helix Ultrabook Convertible compared to a Lenovo ThinkPad T430 laptop paired with either an iPad with Retina Display or a Samsung® Galaxy Note™ 10.1 tablet*



A PRINCIPLED TECHNOLOGIES WHITE PAPER

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SUMMARY

The 2 in 1 vPro Ultrabook, a single device that acts as both a tablet and laptop, can be the best and least expensive way for an organization to meet the needs of workers who want a tablet and a laptop. This versatile new class of laptop boasts the sleek design, light weight, impressive performance, and long battery life of an Ultrabook, the enterprise grade manageability of an Intel Core™ vPro processor, and it transforms—by flipping, sliding, folding, swiveling, or splitting—into a tablet.

We analyzed three-year costs and value for an organization that is considering purchasing two devices for each staff member—a laptop and either an iPad or an Android tablet—both of which the organization will manage, secure, and support. Our analysis shows that a 2 in 1 vPro Ultrabook device is a less expensive and more secure alternative for the organization and provides a better tablet experience for users (see Figure 1).

<p>Savings for organization with one device instead of two</p>	<p>By replacing the two planned devices—a sub-\$1,000 laptop plus consumer iPad or Android tablet—with a 2 in 1 vPro Ultrabook, the organization saves in the following key ways:</p> <ul style="list-style-type: none"> • Hardware costs and hardware support plans can be lower for one device instead of two. • IT department manages and secures one device instead of two. • Intel vPro processor provides high level of manageability and security and adds to cost savings compared to a less-capable laptop. • No software purchases for the separate tablet are necessary. • Longer lifecycle of laptops vs. tablets saves on replacement costs of tablet. • The organization avoids costs for tablet accessories and peripherals. (Note: We did not include these costs in our TCO analysis.)
<p>Better tablet experience for workers</p>	<p>The 2 in 1 vPro Ultrabook gives workers the convenience of having two devices in one. In one mode, it is a clamshell-style Ultrabook with attached keyboard dock and touch screen. Depending on the model, there is also (1) a detachable tablet mode where the tablet separates from the keyboard dock, (2) a convertible tablet mode where you keep the keyboard attached but slide or rotate it under the screen, or (3) both of these options.</p> <p>The 2 in 1 vPro Ultrabook also gives users a better tablet experience for work than a consumer tablet. Like consumer tablets, the 2 in 1 is good for consumption (watching video or browsing) but it is also enterprise ready for solid business productivity. In particular, the 2 in 1 vPro Ultrabook delivers a better tablet experience than a consumer tablet for users running business workloads on Microsoft® Office or other Windows® software.</p>

Figure 1: Advantages of 2 in 1 vPro Ultrabook.

Bring your own device (BYOD) policies move hardware costs from employer to employee but does not otherwise change the overall savings picture. With 2 in 1 vPro Ultrabook vs. a laptop plus a BYOD tablet, the organization saves because it manages, secures, supports, and buys software for one device instead of two.

Figure 2 summarizes the results of our cost analysis, for which we looked specifically at the Lenovo ThinkPad Helix, one of the newest 2 in 1 vPro Ultrabook devices. This Ultrabook offers both a convertible tablet mode where you rotate the touch screen over the keyboard dock and a detachable tablet mode where you disconnect the screen from the keyboard. We compared three-year costs for an organization choosing among three purchase options: a laptop plus an iPad, a laptop plus an Android tablet, and the 2 in 1 vPro Ultrabook. See the [Cost Analysis](#) section for more details.

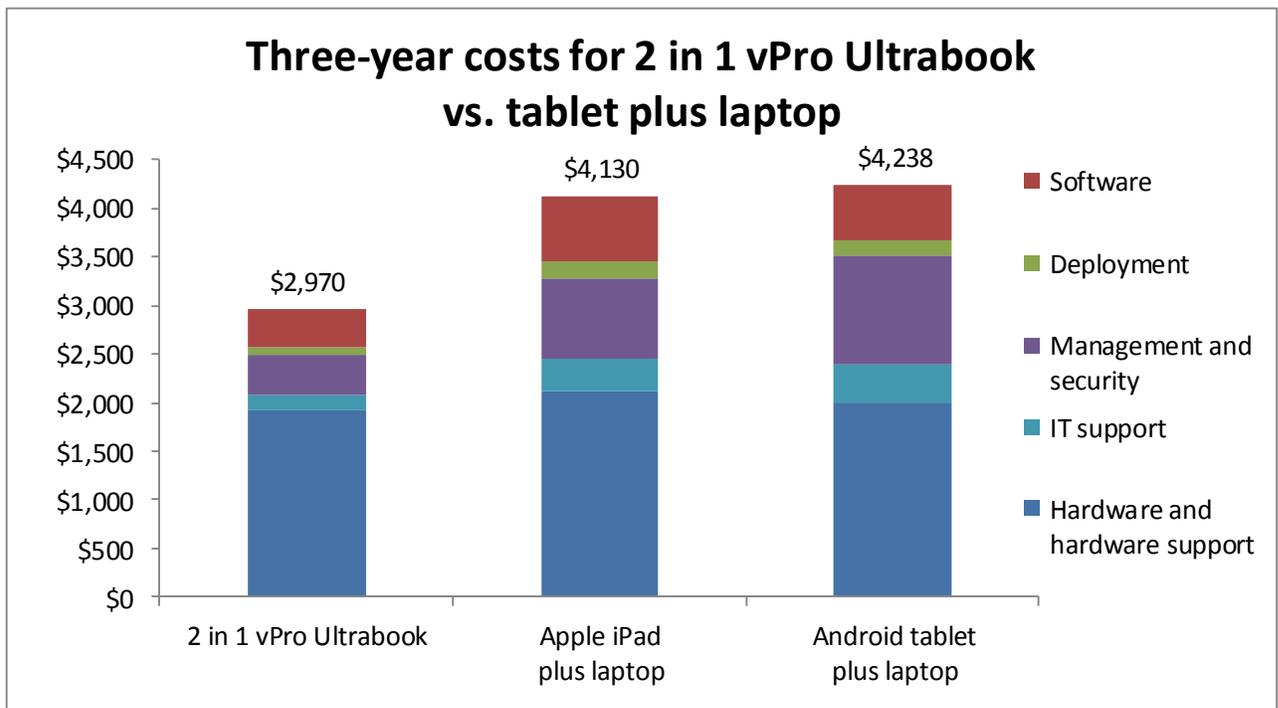


Figure 2: Three-year costs for the three solutions we analyzed.

These results show the following savings for the 2 in 1 vPro Ultrabook compared to purchasing, managing, securing, and supporting two discrete devices:

- **An iPad and a laptop.** We estimate that the 2 in 1 vPro Ultrabook could save \$1,160 per worker over three years. This figure takes into account three-year costs for hardware and hardware support; software to view and edit Microsoft Office documents and spreadsheets on each device; management software costs; and IT costs to deploy, manage, and secure the devices.

- **An Android tablet and a laptop.** The 2 in 1 vPro Ultrabook could save \$1,268 over three years on these same costs.

We used features and costs for specific hardware models and estimated savings over three years for a Lenovo ThinkPad Helix Ultrabook Convertible compared to a Lenovo ThinkPad T430 laptop paired with either an iPad with Retina Display or a Samsung Galaxy Note 10.1 tablet. See Cost Analysis section for more details.

Figure 3 summarizes the keys to savings with the 2 in 1 vPro Ultrabook.

Organization purchases employee a sub-\$1,000 laptop and a consumer tablet	Organization purchases a 2 in 1 device with both laptop and tablet modes
Enterprise must buy two devices and pay for two hardware support plans.	For the models we compared, the hardware (including replacement costs) plus hardware support costs of the 2 in 1 vPro Ultrabook was lower than those costs for the laptop plus consumer tablet
IT department must manage both devices and deploy mobile device management (MDM) tools to manage the tablet.	The biggest savings for the organization come from the fact that the 2 in 1 vPro Ultrabook’s tablet mode eliminates the need to deploy, manage, secure, and support a separate tablet device for each worker.
Laptops without built-in manageability and security of vPro processor costs more to manage and secure.	Intel vPro processors streamline management and security, saving on IT effort and costs and helping organizations secure the devices from security breaches. A durable case and solid hinges should keep repair costs low.
It is necessary to duplicate software on laptop and tablet to give users ability to view and edit Microsoft Office files and carry out other business tasks.	Saves the cost of software for the consumer tablet.
Consumer tablets are replaced more frequently than laptops. In our three-year model, we add costs to replace the tablet after two years.	Saves the cost of replacing the consumer tablet.

Figure 3: Keys to savings.

One additional hardware cost category we did not include is for accessories such as docking stations and covers or carriers. The organization will likely spend more providing these items for two different devices rather than for a single 2 in 1 device.

Savings even with BYOD

Note that while our hypothetical organization for the total cost of ownership (TCO) analysis is planning to purchase both laptops and tablets for their employees, many of the same savings for the 2 in 1 vPro Ultrabook apply if the organization purchases only the laptops for workers and lets workers buy their own tablets and use them for personal and work tasks. While the organization saves hardware and hardware support costs in these BYOD situations, it still incurs the other costs for the tablet that we describe in Figure 3.

The organization must manage and secure any devices—not only those it purchases—that can access email or networked files. This means that it must pay IT costs for two devices, the laptop and the BYOD tablet. In addition, the organization may

have to provide software and help desk support for the BYOD tablets so that workers can be productive with them. Deployment costs for BYOD tablets include IT deploying software and security solutions to the device. An organization eliminates these tablet costs if it purchases a 2 in 1 vPro Ultrabook rather than a laptop and if workers use the Ultrabook in tablet mode instead of their personal tablet for work.

Figure 4 illustrates the cost savings an organization would realize in software, deployment, management and security, and IT support in the BYOD model. We omit the hardware and hardware support but leave other costs the same from the previous graph.

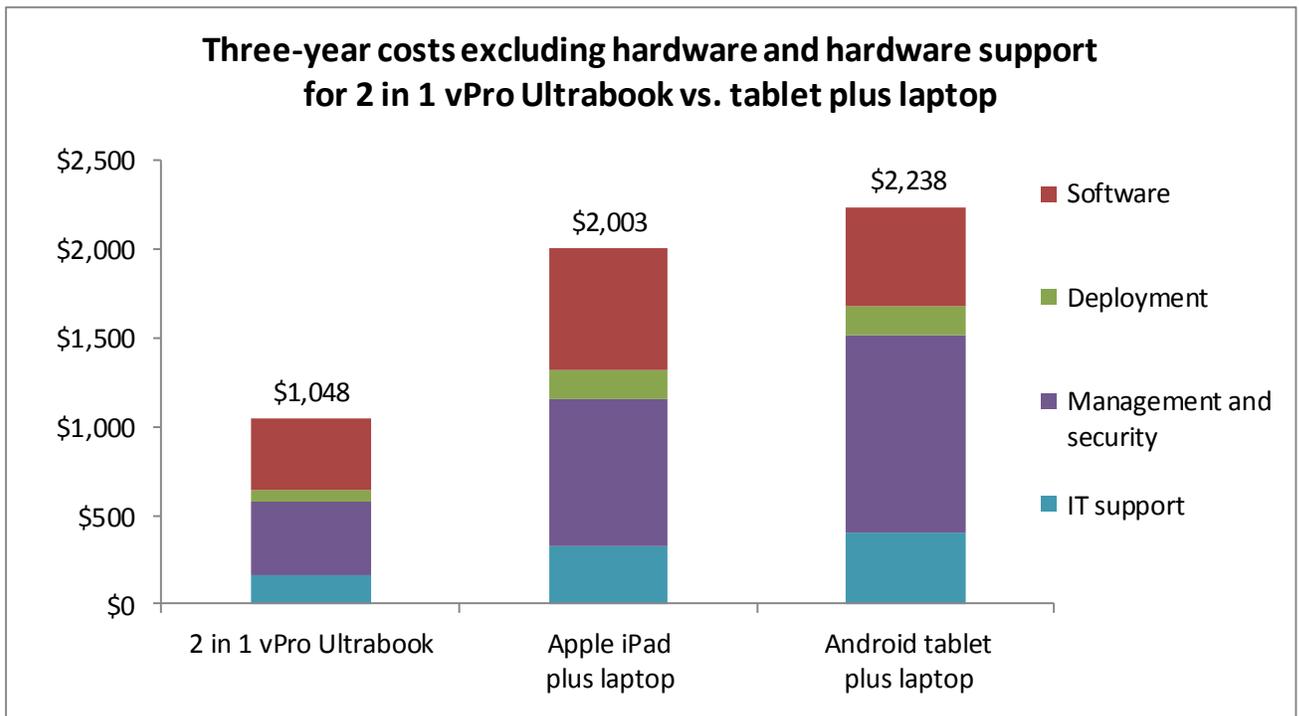


Figure 4: Three-year costs, excluding hardware and hardware support, for the three solutions we analyzed.

Better experience for workers

Users enjoy a better experience with the 2 in 1 vPro Ultrabook because in tablet mode it can run full-featured Microsoft Office applications and other Windows applications that iPad and Android tablets do not support natively. With specifications like those of Lenovo ThinkPad Helix and its 3rd generation Intel Core vPro processor, 4 GB to 8 GB of memory, and expandable solid-state drives, the 2 in 1 vPro Ultrabook meets the demands of office workloads in both its Ultrabook and tablet modes. Users should get far more day-to-day utility, including superior browser functionality, from its Windows 8 tablet than they would from an iPad or Android tablet.

Figure 5 compares user experience on the two device combinations vs. the single 2 in 1 vPro Ultrabook device.

A laptop and a consumer tablet	A 2 in 1 vPro Ultrabook device with both laptop and tablet modes
Two devices, operating systems, and sets of software to juggle	Convenience of an all-in-one device with one OS and one set of business software
Runs different local software on laptop and tablet	Runs Windows 8 applications in all modes
Runs full local versions of Microsoft Office only on the laptop, while Office software for tablets lacks some features ¹	Runs local full versions of Microsoft Office in all modes
Tablets do not match the performance of laptops on typical office workloads ²	In Ultrabook or tablet mode, it delivers the performance users need for typical workloads
Users must deal with issues of application management between the two devices ³	The same applications are available in both modes.
Users who create and modify content on two separate devices must manage their business and personal files across those devices ⁴	The same files are available in both modes.
More to carry with the greater weight of two devices and their separate cables, accessories, and peripherals	Lighter weight and fewer accessories, cables, and peripherals to juggle

Figure 5: User experience comparison for the two solutions.

THE WINNING SOLUTION: 2 IN 1 VPRO ULTRABOOK

Advantages of this new class of laptop built with enterprise workloads and security in mind

In recent months, the market has seen a number of 2 in 1 Ultrabook devices that offer the advantages of an laptop and tablet hybrid, but lack the manageability and security that many organizations require. What sets the 2 in 1 vPro Ultrabook apart and boosts its appeal for enterprise use are (1) the business-grade manageability and security that vPro makes possible and (2) its durability. Figure 6 summarizes the features of one 2 in 1 vPro Ultrabook, the Lenovo ThinkPad Helix.

Lenovo ThinkPad Helix	
2 in 1	<ul style="list-style-type: none"> • A laptop with keyboard and touchpad • Flips, slides, folds, swivels, or splits to transform into a highly mobile Windows 8 tablet with touch and, on some models, a pen device • Stand mode or other modes on some models give users more choices. • Tablet plus mode in Lenovo ThinkPad Helix folds tablet over keyboard to provide performance and battery life advantage of the batteries in both tablet and keyboard. • It is a genuine 2 in 1 device, not a tablet with a clamshell case - it connects physically and solidly, not via Bluetooth, and has hinges and connectors that are built to last. It is always ready to go with features such as Instant On and Always Connected that tablets have popularized.

¹ See our report that describes the better Office 365 experience you get with an Intel Core processor tablet vs. an Apple iPad or Android tablet. www.principledtechnologies.com/Intel/Core_tablet_Office365_0513.pdf

² *Ibid.*

³ While cloud-based services can help users keep their files synchronized, files most typically remain on the device on which the user created them. As workers create, share, and modify content, a single two-in-one device can greatly simplify file management.

⁴ While cloud-based services can help users keep their files synchronized, files most typically remain on the device on which the user created them. As workers create, share, and modify content, a single two-in-one device can greatly simplify file management.

Lenovo ThinkPad Helix	
vPro	<ul style="list-style-type: none"> Enterprise-grade manageability and security with Intel vPro technology extends IT control.
Ultrabook	<ul style="list-style-type: none"> Ultrabook performance with specifications like those of the Lenovo ThinkPad Helix, which offers 3rd Generation Intel Core i5 or i7 processors, 4 GB to 8 GB of memory, and up to 256GB mSATA SSD drive. Thin, sleek, and lightweight design Long battery life. For example, the Lenovo ThinkPad Helix advertises 10+ hours of battery life with one battery in the tablet and a second battery in the keyboard case. Ability to run Windows and Microsoft Office workloads boosts user productivity. Business-class durability

Figure 6: Advantages of the 2 in 1 vPro Ultrabook, specifically the Lenovo ThinkPad Helix

Advantages of 3rd generation Intel Core vPro processors

3rd Generation Intel Core vPro processors provide enhanced security built into the chip and work with your security and management software to let IT staff control a device remotely to diagnose problems, roll out security patches, repair software problems, or wipe the device should it be lost or stolen. Intel vPro technology supports identity and data protection, improved compliance, threat management, hardware-assisted virtualization, secure cloud computing, remote reimaging, and repair. One technology, Intel Identity Protection Technology, supports two-factor authorization to help prevent unauthorized access to devices and network. These greater IT efficiencies lower IT costs.⁵

COST ANALYSIS

We calculated three-year costs for a hypothetical business or school that wants to choose the best laptop-tablet combination for users. Users need both the portability and multi-touch capabilities of a tablet and the productivity advantages of a laptop. The organization is considering purchasing an iPad or Android device plus a laptop for each user. Our analysis shows that a 2 in 1 vPro Ultrabook is a better choice for users and the less expensive and more secure option for the organization.

We compare three options:

- 2 in 1 vPro Ultrabook
- Apple iPad tablet plus a laptop
- Android tablet plus a laptop

When it came to the specific models on which to base our cost comparison, our selection was driven by product availability at the time the Lenovo ThinkPad Helix was released.⁶ We used the following models (for which we provide detailed specifications in [Appendix A](#)):

⁵ For more information, see www.intel.com/content/www/us/en/processors/vpro/core-processors-with-vpro-technology.html.

⁶ We expect to see these new form factors decrease in price, assuming traditional PC pricing models, which makes this comparison even more favorable for the Ultrabook.

- **2 in 1 vPro Ultrabook.** The Lenovo ThinkPad Helix configured with Intel Core i5 processor with vPro technology and Microsoft Windows 8 Pro.
- **Apple iPad.** Apple iPad with Retina Display, 32 GB of storage, and Wi-Fi.
- **Android tablet.** Samsung Galaxy Note 10.1 with 3 2GB of storage and Wi-Fi.
- **Non-Ultrabook laptop.** We paired the iPad and Android tablet with a Lenovo ThinkPad T430 laptop with Intel Core i5 processor and Microsoft Windows 8 Pro. This is a mid-range laptop available for under \$1,000 on the Lenovo site in a base configuration.

Assumptions

Our main assumptions in this analysis:

- Each user needs a laptop and a tablet, either separately or combined in a single 2 in 1 vPro Ultrabook device.
- For the laptop to pair with the tablets, the organization would select a base model of a leading business laptop and configure it with Windows 8 Pro.
- Laptop support plans and corresponding lifecycle are typically three to five years. We assume a three-year lifecycle for the laptop and Ultrabook. A longer lifecycle reduces the IT costs related to procuring, setting up, and deploying devices.
- Tablets typically have shorter lifecycles than laptops. AppleCare Plus for the iPad is a two-year policy. This matches what we see as the typical lifecycle of tablets in the enterprise. In our model, we replace the tablets after two years. We assume purchase of a tablet at the beginning of the three-year analysis period and of a replacement tablet at the same price at the end of year two; because that replacement tablet's life would extend a year past our three-year model, we include only half of its price in the model.
- We assume each device needs a way to view and edit Microsoft Office documents and includes appropriate software on each device. Software costs include a monthly subscription cost for Microsoft Office 365™ Midsize Business at \$15 a month per user, a total of \$540 for the laptop and iPad solution over three years. This subscription would cover a local install of Office 2013 on the laptop and would allow use of Microsoft Office Web apps on the iPad. The Ultrabook solution does not require use of Microsoft Office Web apps, so for that solution we include the cost of a license to Microsoft Office 2013 Professional for \$399.99. We also use Microsoft Office 2013 Professional for the laptop in the Android solution because the Android does not run the Office Web Apps. For the Android, we add the cost of Quickoffice Pro HD for Android, a \$19.99 package that supports

viewing and editing of Word, Excel®, and PowerPoint® files on the Android tablet.

- The organization will support 300 or fewer users; we use that count to select the Microsoft Office 365 Midsize Business version from among the Microsoft Office 365 versions.
- IT is currently managing and securing Windows laptops with best practices and Microsoft System Center Configuration Manager (SCCM) 2012 SP1 and will use those same tools for the Ultrabooks and laptops in this analysis.
- Each user has a Microsoft Enterprise Client Access License (CAL) Suite licensed on a per-user basis. This CAL Suite permits a user's devices to connect to Windows Servers and Microsoft Exchange Servers in the organization and would include SCCM 2012 SP1 support at no extra cost.
- IT will manage the iPad or Android tablets with a leading MDM, such as AirWatch at a cost of \$4 per month per device.
- We estimate three-year costs for hardware and hardware support, software to view and edit Microsoft Office documents and spreadsheets on each device, management software costs, and IT costs to deploy, manage, and secure the devices.
- We configure the iPad and Android tablets with 32 GB of storage, assuming users would not store many corporate files on the devices but would instead store them in SharePoint or use a file-sharing service that their laptop can also access.

Note: The Lenovo ThinkPad T430 laptop that we include in the iPad and Android solutions can be configured with an Intel Core vPro processor. We did not include this processor with the laptop because we wanted to highlight the benefits of vPro capability on the Ultrabook.

For the cost analysis, we include Windows 8 Pro on both the 2 in 1 vPro Ultrabook and the laptop that we pair with the iPad and Android tablets in the two-device solutions.

Figure 7 shows the costs for each option and the savings the 2 in 1 vPro Ultrabook delivers compared to the other two options.

Three-year costs	2 in 1 vPro Ultrabook (Lenovo ThinkPad Helix)	Apple iPad plus Lenovo ThinkPad T430 laptop	Android tablet plus Lenovo ThinkPad T430 laptop
Hardware and hardware support	\$1,922.12	\$2,127.30	\$1,999.78
Software (Office 365 or Office 2013 and management software)	\$399.99	\$684.00	\$563.98
Deployment	\$72.00	\$160.00	\$160.00
Management and security	\$418.35	\$836.71	\$1,115.61
IT support	\$157.72	\$322.34	\$398.24
Total (rounded)	\$2,970	\$4,130	\$4,238
Savings for 2 in 1 vPro Ultrabook		\$1,160	\$1,268
Percentage savings for 2 in 1 vPro Ultrabook		28.1%	29.9%

Figure 7: Three-year costs for the three solutions we analyzed.

Additional user productivity, potential for cellular cost savings, and possible cost avoidance from security threat prevention could add to that cost advantage. We will discuss those separately later.

For more details on costs, see [Appendix A](#).

IN CONCLUSION

We estimated costs for an organization to purchase, deploy, manage, and secure a 2 in 1 Ultrabook with Intel Core processor with vPro technology versus either an iPad or Android tablet combined with a laptop. At first blush, one might expect a sub-\$1,000 laptop and a low-cost tablet to be cheaper than a 2 in 1 vPro Ultrabook. Depending on the models you chose, if you compare only hardware costs, that assumption could be correct because the 2 in 1 vPro Ultrabook tends to be more expensive than a laptop that lacks its vPro capabilities, mSATA SSD drive, and other features. However, the two-device combination quickly loses any cost advantage when you add in the costs of hardware support, tablet replacement costs, and costs to deploy, manage, and secure two devices versus one 2 in 1 vPro Ultrabook device with business-grade security. The savings would become even more dramatic when you consider the costs associated with additional peripheral devices and accessories and time employees must spend managing files and content (costs we omitted from our analysis).

For both companies that want to provide their workers with tablet devices and those that support bring-your-own employee-purchased solutions, the benefits of a single 2 in 1 device such as the 2 in 1 vPro Ultrabook are many.

APPENDIX A: DETAILED COST ANALYSIS

Scenario summary

Users need both the portability and multi-touch capabilities of a tablet and the productivity advantages of a laptop. The organization is considering purchasing an iPad or Android device plus a laptop for staff. It will manage and secure the tablets with mobile device management tools and procedures. Our analysis shows that instead a 2 in 1 vPro Ultrabook is the better choice for users and the less expensive and more secure option for the organization.

What we are comparing

- **2 in 1 vPro Ultrabook:** Lenovo ThinkPad Helix Business Ultrabook convertible with Intel Core i5 processor with vPro technology and Microsoft Windows 8 Pro
- **Apple iPad and laptop:** Apple iPad with Retina Display plus a Lenovo ThinkPad T430 Business laptop with Core i5 processor and Microsoft Windows 8 Pro
- **Android tablet and laptop:** Samsung Galaxy Note 10.1 plus a Lenovo ThinkPad T430 Business laptop with Core i5 processor and Microsoft Windows 8 Pro

Figure 8 gives information about the four devices included in the three scenarios. For this analysis, we are comparing the Ultrabook in the first column with pairings of the two tablets in the middle and the laptop in the rightmost column.

	2 in 1 vPro Ultrabook	Apple iPad	Android tablet	Laptop to pair with tablets
Model	Lenovo ThinkPad Helix	Apple iPad with Retina Display	Samsung Galaxy Note 10.1	Lenovo ThinkPad T430
Description	128GB mSATA SSD with Wi-Fi	32GB with Wi-Fi	32GB with Wi-Fi	500GB with Wi-Fi
Processor	Intel Core i5-3427U processor	Dual-core A6X with quad core graphics	1.4GHz Quad-Core processor	Intel Core i5-3230M processor
Memory	4 GB	1 GB	2 GB	4 GB
Storage	128GB mSATA SSD	32GB integrated flash	32GB integrated flash	500GB hard disk drive, 7200 RPM
OS	Windows 8 Pro 64	iOS 6	Android 4.1. Jelly Bean	Windows 8 Pro 64
Display (inches)	11.6	9.7	10.1	14
Resolution	1,920 x 1,080	2,048 x 1536 resolution at 264 pixels per inch	1,280 x 800	HD (1,366 x 768)
Battery life	Up to 10 hours in laptop mode	Up to 10 hours	9+ hours	Up to 9.7 hours
Bluetooth® wireless technology	Bluetooth 4.0 with Antenna	Bluetooth 4.0	Bluetooth 4.0 (adapter sold separately)	Bluetooth 4.0 with Antenna
Intel vPro technology	Yes	No	No	No
Weight (lbs.) as advertised, may not be exact weight of this configuration	1.8 lbs. tablet, 3.8 lbs. with keyboard	1.44	1.31	4.77

Figure 8: Specifications for the four devices on which we base our analysis.

Cost assumptions

See the [Cost analysis](#) section in main body of report.

Cost descriptions

Our analysis includes costs for the following: hardware, software, deployment, management and security, and IT support.

Hardware costs

Figure 9 shows the purchase price cost for the four devices.

Device costs	2 in 1 vPro Ultrabook (Lenovo ThinkPad Helix)	Apple iPad	Android tablet	Lenovo ThinkPad T430 laptop
Device cost	\$1,583.12	\$599.00	\$499.99	\$820.80
Replacement cost of tablets after two years	N/A	\$299.50	\$250.00	N/A
Three years of hardware support	\$339.00	\$129.00	\$149.99	\$279.00
Hardware subtotal	\$1,922.12	\$1,027.50	\$899.98	\$1,099.80

Figure 9: Purchase price cost for the four devices as of July 3, 2013.

- **Device cost.** We collected price information on July 3, 2013. To get the price of the ThinkPad T430 laptop, we located the laptop on the Lenovo site and chose the “Build your own” laptop option. We customized it with the lowest-price Intel Core i5 processor available for it, the Intel Core i5-3230M processor (3.20GHz, 3MB Cache, 1600MHz) with Intel HD Graphics 4000, upgraded the OS to Windows 8 Pro, and added Bluetooth 4.0 with Antenna. That brought the Web price to \$864. An in-cart discount reduced the price to \$820.80.

The price of the Lenovo ThinkPad Helix is also from the Lenovo site. We configured it with an Intel Core i5-3427U processor and Windows 8 Pro. An in-cart discount reduced the \$1,799.00 price of this configuration to \$1,583.12.

For the two tablets, we chose 32 GB models from the vendor’s Web sites. An in-cart discount reduced the price of the Samsung Galaxy Note 10.1 from \$549.00 to \$499.99.

- **Replacement cost of tablets after two years.** We assume a three-year life cycle for PCs and a two-year life cycle for tablets. We add in half the price of a replacement tablet after two years for each tablet device. We assume the replacement tablet cost is the same as the original tablet.
- **Hardware support.** We selected three-year support plans with accidental damage protection for each device. For the Ultrabook and laptop, Lenovo offers three-year, onsite, next-business-day support plus accidental damage protection plans, with and without Priority Technical Support. We selected the less expensive of the two plans for each device. For the iPad and Android tablets, we used the SquareTrade three-year protection plan price. That price is similar to 1.5 times the two-year price.

Figure 10 shows the hardware costs summed for the three solutions we are comparing. The middle and right columns show the cost for the tablet plus the laptop. In this analysis, the 2 in 1 vPro Ultrabook saves on hardware costs over the two-device options.

	2 in 1 vPro Ultrabook (Lenovo ThinkPad Helix)	Apple iPad plus Lenovo ThinkPad T430 laptop	Android tablet plus Lenovo ThinkPad T430 laptop
Hardware costs	\$1,922.12	\$2,127.30	\$1,999.78

Figure 10: Total hardware costs over three years for the three solutions we are comparing.

Software costs

For the three options, we include the three-year cost of software to view and edit Microsoft Office documents and spreadsheets and management software. Figure 11 shows the costs.

Software	2 in 1 vPro Ultrabook (Lenovo ThinkPad Helix)	Apple iPad plus Lenovo ThinkPad T430 laptop	Android tablet plus Lenovo ThinkPad T430 laptop
Microsoft Office 2013	\$399.99	N/A	\$399.99
Microsoft Office 365 Midsize Business	N/A	\$540.00	N/A
Quickoffice Pro HD for Android tablets	N/A	N/A	\$19.99
MDM for tablet management (\$4 a month)	N/A	\$144.00	\$144.00
Software subtotal	\$399.99	\$684.00	\$563.98

Figure 11: Software costs over three years for the three solutions we are comparing.

We include the following software costs:

- **Microsoft Office 365.** For the iPad plus tablet solution, we include a three-year subscription to Microsoft Office 365 for Midsize Business. The per-user subscription allows a local install of Microsoft Office 2013 on the laptop and includes rights to run Microsoft Office Web apps, Microsoft's cloud-based Office suite, on additional devices, such as the iPad in this analysis or a smartphone. These apps include Word, Excel, PowerPoint, and Outlook® Web apps, in addition to the Lync Web App collaboration tool. The Office Web apps lack some of the features of Microsoft Office 2013, so users in our scenarios would have a more robust Office experience running Microsoft Office 2013 locally on the laptop than running the Web apps on the iPad and Android tablets.⁷
- **Microsoft Office 2013.** We include the licensing cost for a local install of Microsoft Office Professional 2013 for the Ultrabook and the laptop plus Android solutions, neither of which will use the Web apps. The 2 in 1 Ultrabook does not need them because both Ultrabook and Tablet mode work well with the local install of Microsoft Office 2013. For the Android tablet, we do not include the Office Web apps because we have had little success in running Microsoft Office Web apps in our hands-on testing with Android tablets. The apps were acceptable for viewing documents and spreadsheets, but did not support editing.
- **App on Android tablet.** In our tests, conducted in June 2013, we found that while the Microsoft Office Web apps worked well on the iPad, they did not yet run on the Android tablets. For the Android tablet scenario, we give tablet users some ability to edit Microsoft Office documents by adding a third-party app, Quickoffice Pro HD.
- **Management software.** We also include the \$4 monthly subscription cost of the top-rated AirWatch MDM to manage the tablet devices.

Deployment costs

We include the staff cost to deploy all the devices at the start of the three-year model and to deploy a replacement tablet after two years (see Figure 12).

⁷ See our report that describes the better Office 365 experience you get with an Intel Core processor tablet vs. an Apple iPad or Android tablet. www.pricedtechnologies.com/Intel/Core_tablet_Office365_0513.pdf

Deployment	2 in 1 vPro Ultrabook (Lenovo ThinkPad Helix)	Apple iPad plus Lenovo ThinkPad T430 laptop	Android tablet plus Lenovo ThinkPad T430 laptop
Tablet deployment	N/A	\$40.00	\$40.00
Replacement tablet deployment cost	N/A	\$40.00	\$40.00
Laptop deployment	\$72.00	\$80.00	\$80.00
Total deployment	\$72.00	\$160.00	\$160.00

Figure 12: IT staff costs over three-years to deploy the three solutions we are comparing.

We estimate costs to deploy a conventional laptop with Windows 8 Pro at \$80, and put the cost of a 2 in 1 Ultrabook with Intel Core vPro processor at 10 percent lower. For iPad and Android tablets, we include the cost to deploy the original tablet and two years later a replacement tablet, with each deployment costing \$40 per device.

Management and security costs

Figure 13 summarizes costs to manage and secure the devices. We assume one IT full-time employee (FTE) can manage and secure 500 Lenovo ThinkPad T430 laptops (or other laptops not enabled with Intel vPro technology) at a cost of \$464.84.⁸ Compared to the base cost of managing Lenovo ThinkPad T430 laptops,

- We estimate that IT costs can be 10 percent lower managing a vPro-enabled laptop such as the Lenovo ThinkPad Helix.
- We expect IT costs can be 20 percent lower managing iPad tablets.
- We expect IT costs to be 40 percent higher managing Android tablets, which have fewer enterprise capabilities and are more consumer oriented.

Management and security	2 in 1 vPro Ultrabook (Lenovo ThinkPad Helix)	Apple iPad	Android tablet	Lenovo ThinkPad T430 laptop
Management and security costs	\$418.35	\$371.87	\$650.77	\$464.84
Devices per FTE	555.56	625.00	357.14	500.00

Figure 13: Management and security costs over three years for the devices in our analysis.

Figure 14 shows the management and security costs summed for the three solutions we are comparing. The two columns at right show cost for the tablet plus the laptop.

	2 in 1 vPro Ultrabook (Lenovo ThinkPad Helix)	Apple iPad plus Lenovo ThinkPad T430 laptop	Android tablet plus Lenovo ThinkPad T430 laptop
Management and security costs	\$418.35	\$836.71	\$1,115.61

Figure 14: Management and security costs over three years for the solutions we are comparing.

⁸ To get average staff cost for the 500 devices, we used average salary and benefits for System Administrator of \$77,473 from Salary.com as of July 3, 2013, divided by 500, and multiplied by three years.

The same features that make non-PC tablets less capable for business can also make them easier to manage and secure. Because non-PC tablets have fewer moving parts and run more as a thin client than a PC for many office tasks, they should theoretically be easier to manage and secure than a PC tablet. We found this to be true for iPads but much less so for Android tablets.

The iPad is designed to be easy on the management budget. Apple locks down the hardware and OS software and vets apps. This has the effect of reducing IT's role in managing the device and the apps on it and consequently the cost to manage and secure the iPad. IT does not manage or secure the iPad at the BIOS or OS level as it does on PCs because it has no access. IT does not need to debug problems with application interactions because apps run in isolation. IT cannot secure ports that are not there. IT does not need to debug problems with mice or monitors because the iPad does not connect to them. Apple provides a single source for all updates and vets the updates so IT does not have to hunt updates down at the various hardware and software sites as it does with PCs and does not have to debug interactions among those updates. All of this leads to lower management costs.

The iPad is a tablet, not a tablet PC. It does not run Windows software locally, only remotely, operating as a thin client to run hosted software, or accessing PC software over the cloud or running Web-based versions of the software. In our scenario, the users want to run Microsoft Office on the tablets. Because there is no iPad app for Microsoft Office, users must run cloud-based, Web-based, or hosted versions. Software run remotely moves related management problems and solutions away from the device to the server or cloud and saves on device-specific management costs.

These benefits come at a cost. The iPad trades off manageability for user productivity. Many of the aspects of the iPad that make it more manageable also limit user productivity. The iPad hardware is less complicated than a tablet PC hardware, but also less capable for some tasks. iPad hardware is well suited to run its own local apps, but it is not the match for complex tasks on the remote versions of Microsoft Word, Excel, and Outlook users must be connected to a Wi-Fi or cellular network to be able to be productive with remote software. The iPad gains on manageability because it has fewer connections to manage, but as a result, a user cannot connect a keyboard, mouse, and monitor that could improve their productivity working with Office programs. Apple's tight control on Apps and features means users cannot use local browsers on the iPad to access Flash on Web sites or download tools that they need to access features on some Web sites. We do not calculate a user productivity cost in this analysis.

Google is less controlling of Android tablet devices and apps, giving users and IT more flexibility and consequently raising management cost and security risk. That

accounts for a large part of the much higher costs we show for Android management and security.

IT support costs

Figure 15 shows the IT support costs for the solutions we are comparing. For the Windows 8 Pro laptop, we estimate IT support costs as the cost of one help desk call per year per device at an average cost of \$40 per year, an average annual IT repair cost of \$6 based on an assumption that 3 percent of systems need repair, and a cost for in-house labor related to accidental breakage of \$11.17 per year based on assumption that 10 percent of systems per year suffer some breakage for a total of \$171.52 over three years.

IT support	2 in 1 vPro Ultrabook (Lenovo ThinkPad Helix)	Apple iPad plus Lenovo ThinkPad T430 laptop	Android tablet plus Lenovo ThinkPad T430 laptop
Tablet IT support	N/A	\$150.82	\$226.72
Ultrabook and laptop IT support	\$157.72	\$171.52	\$171.52
IT support subtotal	\$157.72	\$322.34	\$398.24

Figure 15: IT support costs over three years for the solutions we are comparing.

Additional advantages we do not quantify

The 2 in 1 vPro Ultrabook could also offer even more savings potential in the areas of user productivity benefits and security cost avoidance. It could deliver savings related to user productivity because users can perform a broader range of tasks with the 2 in 1 vPro Ultrabook in tablet mode than they can with an iPad or Android tablet. The built-in security of this platform could help organizations reduce costs associated with security breaches compared to less-secure devices. This savings potential varies from industry to industry as regulatory requirements and penalties differ.

APPENDIX B - BUSINESS VALUE OF 2 IN 1 VPRO ULTRABOOK

Organizations do not base buying decisions solely on cost. In addition to saving money, the 2 in 1 vPro Ultrabook also provides a better experience for workers compared to a separate laptop and tablet devices.

Better experience for users

The 2 in 1 vPro Ultrabook gives users the convenience of a tablet and laptop in one: a capable Ultrabook laptop and, most crucially, a tablet they can use to perform everyday tasks.

A tablet that performs everyday office tasks

If all users demand from a tablet is the ability to check email, do light browsing, and run the company or school's on-line videos, almost any tablet will do. However, to perform a broader range of tasks, they need a tablet that can open and edit Microsoft Office files and provide a richer browsing experience—areas in which Windows 8 tablets excel. The 2 in 1 vPro Ultrabook adds value and convenience by combining a Windows 8 Ultrabook and Windows 8 tablet in one device. With its 3rd Generation Intel Core vPro processor, 4 GB to 8 GB of memory, and up to 256GB mSATA SSDs, the 2 in 1 vPro Ultrabook can handle a much more robust workload. It has these key advantages:

- **Ultrabook performance.** Ultrabooks can handle most business and education usage scenarios. iPad and Android tablets, with their less capable processors and lower memory capacity, cannot match the performance of the laptop we pair them with or the 2 in 1 vPro Ultrabook.
- **Microsoft Office compatibility.** Microsoft Office is the leading software in business and education, and other Windows applications drive many other functions. Users can accomplish more online and offline with full-featured Microsoft Office applications running Microsoft Office 2013 on a Windows 8 tablet instead of limited feature apps or cloud services on an Apple iPad or Android tablet.⁹ Microsoft Office 365 Web Apps on the Apple iPad provide a good experience on the iPad, but in our tests could not match the capabilities or performance of Microsoft Office 2013 on a Windows 8 tablet. Microsoft Office Web Apps do not currently provide editing capability on Android tablets. Popular editors for Android tablets—such as Quickoffice Pro HD, Polaris Office, and the CloudOn service—lag in performance, capability, and compatibility with Office 2013.
- **Fully capable browser.** In our experience, the Windows 8 Pro tablets offer a superior browsing experience. In a comparison in our labs, we rank

⁹ Check out our report that describes the better Office 365 experience you get with an Intel Core processor tablet vs. an Apple iPad or Android tablet. www.principledtechnologies.com/Intel/Core_tablet_Office365_0513.pdf

browsing experience as only fair on the iPad and some Android browsers that lack Flash support. With nearly a fifth of sites including Flash components,¹⁰ lack of support for Flash on the iPad browsers and some Android devices limits the utility of those browsers. In tests in our labs, we have experienced other frustrating lapses and performance lags using popular browsers on iPad and Android devices.¹¹ Based on comparisons of browser features and performance in our labs, we ranked Windows 8 browsers higher than the browsers we tested on iPad and Android tablets.

- **Connectivity.** Users need devices that can connect to other devices, to mice, to monitors, and to the organization's file servers. 2 in 1 Ultrabook devices offer a variety of connectivity options via ports on the tablet and often more ports on the keyboard dock, letting users connect to a variety of devices and to multiple devices at once. Fewer connectors on iPad and many Android tablets limit their connectivity. They lack sufficient ports to connect to both a physical keyboard and a mouse, a combination many users rely on for input. Some Android tablets support older Bluetooth standards—3.0 instead of 4.0—so cannot connect to all modern Bluetooth devices.
- **Cellular option.** Like the iPad and many Android tablets, 2 in 1 vPro Ultrabook devices such as the ThinkPad Helix include options for cellular connectivity, so that users who need it can connect when out of Wi-Fi range. In addition to costs for service from your cellular provider, optional cellular features usually add to the device cost. We do not include cellular costs in our price model.
- **Worker productivity.** The fast startup and response times and long battery life of the Ultrabook should improve productivity compared to less-capable laptops. Workers can be more productive with one 2 in 1 vPro Ultrabook device that runs the same capable Microsoft Office and browser software in tablet and Ultrabook mode than they could by switching between different software packages on separate laptop and tablet devices.
- **Tablet utility for business and other organizations.** Non-Windows tablets have less utility than a Windows 8 tablet such as the 2 in 1 vPro Ultrabook. In our experience, typical usage of these tablets focuses on email, calendars,

¹⁰ W3Techs provides information about the usage of various types of technologies on the Web and reports that though Flash use is decreasing, 19.4 percent of sites were still use it as of April 30, 2013. w3techs.com/technologies/details/cp-flash/all/all

¹¹ Based on our testing, the Intel® Atom® processor-powered HP ElitePad with Windows® 8 Pro 32-bit operating system delivered a superior Web browsing experience when compared to an Apple® iPad® 4, Samsung® Galaxy Tab® 2, and a Microsoft® Surface RT with Windows 8 RT. We found a higher incidence of problems on the non-Intel based tablets, creating frustrating user experiences. The problems we encountered were general incompatibilities and broken features. For details, see our report at www.principledtechnologies.com/Intel/Tablet_browser_experience_0413.pdf.

document viewers, time tracking, and Web browsing, with the possible addition of custom apps, online customer demos, and apps that provide remote access to files, such as VPN and SharePoint.

A Windows tablet, like the one you get with a 2 in 1 vPro Ultrabook device, can save the organization the cost of migrating existing in-house Windows applications and Web-based apps to run on other tablet OSs and browsers. Workers in large organizations likely have access to a variety of Windows applications or Web apps developed in house and customized to their organization that they use to track their time, reserve space or resources, schedule events or classes, demo products, and carry out other day-to-day tasks. These Windows 8-compatible tools and Windows 8 browser-compatible apps should run as is on a 2 in 1 Ultrabook in tablet mode. However, the Windows tools will likely not run locally on the iPad and Android tablet and the Web apps may fail on those tablets due to browser incompatibilities. The workarounds to this situation are less than ideal: workers do without useful in-house software tools on their non-PC tablets, workers run them inefficiently over a remote Windows connection, or the organization incurs the (often large) cost of converting these tools to run on other tablet OSs and browsers.

There are options for editing Microsoft Office documents and spreadsheets, which could theoretically make these tablets more useful for business and school; however, they lack many features of the full Office versions. In contrast, Windows 8 tablets let users use the same Windows software they run on their laptop, including full versions of Microsoft Outlook and other Microsoft Office applications. Because they support the applications users need to do their work, Windows 8 tablets should deliver better value and be used more than non-Windows tablets.

The convenience of one device instead of two

The 2 in 1 vPro Ultrabook transforms on the fly. You can use it in clamshell mode for editing a document at your desk using the keyboard and touchpad or switch to tablet mode and touch to check a calendar in a meeting or show a video in the hall. Models may offer additional options; the Lenovo ThinkPad Helix, for example, supports a stand mode and includes a digitizer pen.

In addition, the 2 in 1 vPro Ultrabook offers these benefits:

- **Lighter.** The newest 2 in 1 vPro Ultrabook, the Lenovo ThinkPad Helix, weighs 1.8 pounds in tablet mode and an additional 2 pounds with the keyboard dock. That is less than the combined weight of a laptop and tablet.

When you add the weight of power supplies and other accessories, the 2 in 1 vPro Ultrabook is even lighter by comparison.

- **More energy efficient.** Users have one device instead of two to charge, power, and find outlets for.
- **Less clutter.** One device means fewer power cords, peripherals, and accessories to keep track of.
- **Less accessory duplication.** Users need a case, peripherals, and accessories for only one device.
- **Less software duplication.** Unlike devices with different OSs, which may be able to share cloud, Web, and hosted software but need different local software, the 2 in 1 vPro Ultrabook uses a single set of applications.
- **Less software to learn.** Software works the same in laptop and tablet mode, with the only difference being whether you use touch-only interaction.
- **Easier to manage content and applications.** With one device, you need not remember which files are on which device and the software and files you need are always with you.

With the 2 in 1 vPro Ultrabook, users get the convenience of only one device to learn and use. They decide which mode to use for a task rather than which device to use. It should be easier for a user to move smoothly between a tablet on the go and an Ultrabook at the desk when one device with one OS and common software can do the work of both.

2 in 1 Ultrabooks with Windows 8 Pro and Intel vPro technology are easier to manage, secure, and support

2 in 1 vPro Ultrabooks are built with features that make them easier and less costly to manage, secure, and support than conventional laptops. Windows 8 Pro and Intel Core vPro processors add enhanced security features and give IT more flexibility and control to manage the devices. Cases are durable metal, not plastic, and are constructed to withstand everyday use. These devices are backed by OEM support agreements that include on-site repair and fast response. The 2 in 1 vPro Ultrabook with these features is easier to manage and support than the conventional laptop in the other two options, which we have configured with Windows 8 Pro but not Intel vPro support; they save even more when compared to the cost to manage both the laptop and either an iPad or Android tablet.

Enterprise-grade management and security deliver value for IT

Windows 8 Pro devices can join a Windows domain and access Active Directory resource, both of which are needed for a managed Windows environment. Intel vPro technology provides enhanced security built into the chip and work with your security and management software.

Enterprise-grade manageability and security on 2 in 1 vPro Ultrabooks can deliver savings and benefits in the following areas:

- **Secure enough for regulated industries.** Most organizations want to secure devices and the critical data they can access. Some are subject to government and industrial regulations that require specific security protections. Management software can work with Windows 8 Pro and Intel vPro technology to help IT meet these security needs:
 - **Full-disk encryption.** Regulatory requirements for some industries, such as healthcare and finance, proscribe penalties or fines if devices that lack full disk encryption are lost or stolen. Windows 8 Pro systems support full-disk encryption using either Microsoft BitLocker or a self-encrypting hard drive.
 - **Audit requirements.** These tools can meet government or industry regulations to audit hardware and software.
 - **Malware protection.** Windows 8 Pro provides better protection against malware and threats that could jeopardize compliance with data protection regulations.
 - **Wiping stolen devices.** IT can use management software to locate, disable, and wipe lost or stolen devices that are secured Intel vPro technologies.
- **Ease of management.** IT can manage and secure 2 in 1 vPro Ultrabooks with the same tools, such as Microsoft System Center Configuration Manager (SCCM) 2012 SP1, and the same procedures that it uses for other Windows laptops. These tools may offer no support or only limited support for iPad and Android devices and the procedures may not work with those devices. To provide robust management of iPad and Android devices, IT would then need to budget for mobile device management (MDM) tools and infrastructure and develop procedures to manage and secure the devices.
- **Remote management.** IT staff can use management tools to take remote control of a Windows 8 Pro device to diagnose and resolve software problems remotely and to roll out security patches. Effective remote management cuts the number and cost of desk-side visits.
- **Business-grade hardware.** 2 in 1 vPro Ultrabooks are constructed to withstand everyday use by mobile professionals. A durable case and strong hinges reduces the IT break-fix workload and reduces user downtime waiting for repairs. Advanced security features such as fingerprint readers (on some models) and full-disk encryption protect enterprise data and user identities.

- **Business-grade support.** Vendor support agreements can provide next-business-day repairs that are not included in typical support agreements such as AppleCare plus for the iPad or SquareTrade or other (often third-party) plan for Android tablets. Support agreements that include accidental damage protection speed up repairs.

2 in 1 device means one device instead of two to manage, secure, and support

The biggest benefit for IT and the enterprise budget with the 2 in 1 vPro Ultrabook comes from having one device instead of two to manage, secure, and support:

- **Stand-alone tablets in the enterprise add to the IT workload.** If IT does not manage and secure any device that can access enterprise applications and data, it risks regulatory penalties or other costs of data loss. Workers also require IT support for any compute device they use for business. Those requirements have IT supporting both the laptop and tablet, two devices per user vs. one. Only 2 in 1 vPro Ultrabook saves the cost of managing a second, tablet device for workers who also use a laptop.
- **Saves the MDM-related management costs.** With the two-device options, IT must maintain two parallel management and security solutions: the existing Windows management and security tools for the laptop and separate mobile device management tools for the tablets.
- **2 in 1 vPro Ultrabook offers superior security.** Newer iPad models support encryption, “Find My iPad” functions, and remote wipe of stolen devices, letting organizations manage and secure them effectively with MDMs. 2 in 1 vPro Ultrabooks can offer better user identification security with optional fingerprint readers. The 2 in 1 vPro Ultrabook also improves on management and security compared to the Android tablets. Android tablets are typically more consumer-focused and lacking in business-grade security.

2 in 1 vPro Ultrabooks are a win for IT with manageability, security, and durability advantages over conventional laptops and even more so over the combination of a conventional laptop and an Android or iPad tablet.

Two devices in one saves costs of managing a separate tablet

The biggest benefit for IT and savings for the enterprise comes from supporting one device instead of two for each worker. A single 2 in 1 vPro Ultrabook instead of a laptop plus an iPad or Android tablet eliminates the costs of deploying, managing, securing, and supporting stand-alone tablets and can deliver savings throughout the lifecycle of the device.

- **Procurement.** IT needs to procure only half the number of devices. It saves even more on device count if your laptops have a three-year or greater life

cycle and tablets have a two- to three-year life cycle. In our analysis, we compare purchase of one 2 in 1 vPro Ultrabook to three devices in the other two models – a laptop and a tablet plus a replacement tablet after two years.

- **Hardware support agreements.** Organizations pay for vendor support and accidental damage protection for only one device per user.
- **Software purchase.** Organizations save the costs of tablet software.
- **Management software.** IT can manage the 2 in 1 vPro Ultrabook as they would other mobile PCs, so can avoid paying for mobile device management software geared to Apple iPad and Android tablets or developing and maintaining separate procedures for managing tablets.
- **Application development.** Organizations can avoid the costs of developing custom apps for the Android tablets for their staff. The 2 in 1 vPro Ultrabook can run the Windows version of these applications.
- **Deployment.** IT has fewer devices to set up and deploy to users.
- **Training.** Users need to learn how to use one device, not two.
- **Management and security.** IT has fewer devices to update, debug, and secure.
- **Software tracking.** IT has fewer software packages to track to ensure compliance with vendor agreements.
- **Device failures.** Fewer devices likely mean fewer repairs.
- **Theft.** IT has fewer devices to set up with tracking software so they can be found if lost or stolen.
- **Help desk support.** Support staff has fewer devices to learn and support.
- **Disposal.** There are fewer devices to dispose of at the end of their lifecycle.

APPENDIX C - LENOVO THINKPAD HELIX

We selected the recently released Lenovo ThinkPad Helix as the 2 in 1 vPro Ultrabook for the cost analysis section of this paper. The Lenovo ThinkPad Helix¹² offers attractive features for workers and IT (features current as of July 3, 2013):

- It weighs 1.8 pounds in tablet mode.
- At 3.8 pounds with keyboard, it is lighter than the combined weight of a laptop plus an iPad or Android tablet.
- It is capable of Business-grade security and manageability and is built for durability.
- It is available with up to a 3rd generation Intel Core i7 processor.
- It has the advanced security features of Intel vPro and AMT technology available with some processor options, BIOS encryption, Kensington Lock port, TPM chip, and Computrace™ support.¹³
- It can be configured with Windows 8 Pro.
- It offers up to 10 hours battery life with the combined batteries of tablet and keyboard dock.
- It is available with up to 256GB mSATA SSD storage and up to 8GB DDR3 memory.
- It offers Wi-Fi and selected models provide embedded mobile broadband so workers can stay connected anywhere.
- It has a variety of ports: USB 2.0 port and Mini DisplayPort on the tablet, and USB 3.0 port and another Mini DisplayPort on the keyboard dock.
- It has an 11.6-inch 1920 x 1080 display that gives you the screen real estate to display multiple applications side by side or run an HD video.
- Its digitizer pen option offers another way to work with the tablet.
- Lenovo offers one- to four-year warranty support with Onsite Next Business Day Response and accidental damage protection.¹⁴

¹² shop.lenovo.com/us/en/tablets/thinkpad/thinkpad-helix/?cid=us|semd|se|msn|Helix65|ThinkPad_Helix|IIP_NE_Lenovo_Helix|300215&#techspecs

¹³ shop.lenovo.com/us/en/tablets/thinkpad/thinkpad-helix/?cid=us|semd|se|msn|Helix65|ThinkPad_Helix|IIP_NE_Lenovo_Helix|300215&

¹⁴ Shown as an optional warranty upgrade when you configure a model in Lenovo store.

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