**TOTAL COST OF OWNERSHIP:**
**DELL LATITUDE E6510 VS. APPLE 15-INCH MACBOOK PRO**



A TCO comparison commissioned by Dell Inc.

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# Introduction

For the education market, the average total cost of ownership (TCO) of a business-class Dell™ Latitude™ E6510 notebook is lower than that of its Apple® 15-inch MacBook® Pro counterpart. In this paper, Principled Technologies compares the 5-year TCO of the two systems for student computing programs. We find that the Dell system is the more economical purchase option. We consider the specific case of a school, school district, or university.

## Scope of this analysis

We assume for this TCO analysis that a school system is seeking to replace end-of-life Microsoft® Windows®-based PCs running Microsoft Office® 2007 applications in an existing one-to-one notebook program that has server-based management software in place to manage those systems. We also assume that the programs distribute notebooks to students to use during school and to take home at the end of the school day to use and charge.

We include costs for hardware, basic limited warranty, productivity software, security software, and battery replacement in our analysis.

The hardware costs in this analysis are based on list price data for the education market at the Dell K-12 Retail Store[1] on the Dell Web site and the Apple in Education[2] pages on the Apple Web site. They include the devices, operating systems, and basic limited warranty, and exclude taxes and shipping. Please keep in mind that vendors often discount list prices.

# TCO savings for the Dell Latitude E6510 notebook

In our analysis, the Dell Latitude E6510 could save $125 for a single system or $150 per system in quantities of 10 or more over a projected 5-year system lifespan compared to the Apple 15-inch MacBook Pro. The savings increase with volume purchases; for example, we calculate $150,000 savings when purchasing 1,000 Dell Latitude E6510 systems.

Figure 1 shows the savings we project for purchase quantities from 1 to 1,000 devices. For device quantities greater than one, we used list prices for multi-user security software packs, which resulted in an additional software savings for the Dell Latitude E6510 for quantities of 50 or more.

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[1] http://www.dell.com/us/en/k-12/notebooks/Latitude-Notebooks/ct.aspx?refid=latit&s=k12&cs=RC1084719

[2] http://store.apple.com/us_edu_21023/browse/home/shop_mac/family/macbook_pro?mco=MTM3NDc0NDI

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| Device quantity | Dell savings |
|---|---|
| 1 | $125.00 |
| 50 | $7,500.00 |
| 100 | $15,000.00 |
| 250 | $37,500.00 |
| 500 | $75,000.00 |
| 1,000 | $150,000.00 |

Figure 1: Five-year TCO savings for the Dell Latitude E6510 vs. the Apple 15-inch MacBook Pro for purchase quantities from 1 to 1,000 devices.

Figure 2 presents the costs by category for the two notebooks. We include costs for hardware (including operating systems and basic warranty support), productivity software, security software, and battery replacement in our analysis. As Figure 2 shows, most of the Dell savings are in the productivity software category; the Dell Latitude E6510 provides greater savings because the school can transfer existing productivity software licenses from the end-of-life systems to the new systems.

| | Dell Latitude E6510 | Apple 15-inch MacBook Pro |
|---|---|---|
| Hardware | $1,784.00 | $1,699.00 |
| Productivity software | $149.00 | $298.00 |
| Security software | $74.95 | $74.95 |
| Battery replacement (one replacement battery at year 2.5) | $89.00 | $125.00 |
| Total | $2,096.95 | $2,246.95 |
| Dell savings | **$150.00** | |

Figure 2: Five-year TCO savings per system for the Dell Latitude E6510 vs. the Apple 15-inch MacBook Pro for purchases of 10 or more notebooks. (Price quotes as of 6/17/2010.)

These savings could grow substantially for buyers who do not want all the features of these configurations, because Dell allows them to configure systems as they want them. See "Additional possible Dell savings" below for more information.

## Hardware and operating system costs

The hardware costs in this analysis are based on list price data for the education market at the Dell K-12 Retail Store on the Dell Web site and the Apple in Education pages on the Apple Web site. They include devices and operating systems. We configured a Dell Latitude E6510 for $1,784.00 on the Dell K-12 Retail Store with features that best matched those of the lowest priced Apple 15-inch MacBook Pro, which lists for $1,699.00 at the Apple in Education site.

Our analysis uses those hardware list prices for each of the purchase quantities from 1 to 1,000 devices that we show in Figure 1 and does not include quantity discount prices. A school system buying either the Dell or

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Apple device in volume should be able to negotiate hardware price discounts from the vendor. These discounts typically increase with the size of the purchase and are based on a percentage of purchase price. We assume that the percentage discounts for quantity licenses are similar from different vendors.

Both the Dell and Apple systems we configured have 2GB memory, a 250GB hard drive, and provide connectivity through BlueTooth and Wireless LAN.

**NOTE:** The Apple 15-inch MacBook Pro includes complimentary telephone technical support[3] for 90 days from the date of Apple MacBook Pro purchase and a 1-year limited warranty, while the Dell Latitude E6510 includes a 3-year Basic Limited Warranty and 3-year Next Business Day Onsite Service. This was the shortest warranty available for the Dell system on the Dell K-12 Education or Dell Higher Education Web site

Figure 3 shows the key features of the two systems.

| | Dell Latitude E6510 | Apple 15-inch MacBook Pro |
|---|---|---|
| |  |  |
| Processor | Intel® Core™ i5-520M (2.4GHz, 3M cache) with Turbo Boost Technology | 2.4GHz Intel Core i5 |
| Memory | 4GB, 1,333MHz DDR3 SDRAM, 2 DIMMS | 4GB 1,066MHz DDR3 SDRAM, 2 x 2GB |
| Graphics | 512MB NVIDIA® NVS 3100M | NVIDIA GeForce® GT 330M discrete graphics processor; Intel HD Graphics with 256MB of DDR3 SDRAM shared with main memory |
| Hard drive | 320GB 7,200 RPM hard drive | 320GB Serial ATA Drive @ 5,400 RPM |
| Optical drive | 8X DVD+/-RW w/Roxio and Cyberlink Power DVD™, no media | SuperDrive 8x (DVD±R DL/DVD±RW/CD-RW) |
| Operating system | Genuine Windows 7 Professional, 32-bit, no media | Mac OS® X v10.6 Snow Leopard® |

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[3] http://www.apple.com/support/complimentary/

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| | Dell Latitude E6510 | Apple 15-inch MacBook Pro |
|---|---|---|
| Battery | 9-cell (90Wh) lithium ion battery | Built-in 77.5-watt-hour lithium-polymer battery |
| Bluetooth | Dell Wireless 375 Bluetooth Module | Bluetooth 2.1 + EDR |
| LCD | 15.6" HD+(1600x900) Wide View Anti-Glare LED with Premium Panel Guarantee | 15.4" (diagonal) LED-backlit glossy widescreen display |
| Touch screen | None | None |
| Camera | Light-sensitive Webcam | iSight® camera |
| Keyboard | Internal English backlit keyboard | Backlit keyboard |
| Wireless LAN | Intel Centrino® Advanced-N 6200 802.11a/b/g/n Half Mini Card | AirPort Extreme® Wi-Fi wireless networking (based on IEEE 802.11n specification); IEEE 802.11a/b/g compatible |
| Basic support | 3-year Basic Limited Warranty and 3-year Next Business Day Onsite Service | Complimentary telephone technical support for 90 days from purchase and a 1-year limited warranty |

**Figure 3: Key features of the Dell Latitude E6510 and Apple 15-inch MacBook Pro configurations we considered in this analysis.**

## Productivity software

We include productivity software on both devices so that students would be able to create and view presentations, documents, and spreadsheets. We assume that the end-of-life notebooks that the schools are replacing have up-to-date Microsoft Office Home and Student licenses that will transfer to the new Dell notebooks. We include the initial purchase of Microsoft Office Mac 2008 - Home and Student Edition for the Apple 15-inch MacBook Pro to provide students with productivity software on that device. We also estimate the cost of the purchase of new productivity software versions for both devices after 3 years; we use current Microsoft Office– Home and Student Edition list prices for that estimate.

## Security software costs

We include annual renewals for security software for both devices, Norton™ Antivirus 2010 for the Dell Latitude E6510 and Norton Antivirus 11 for Mac® for the Apple 15-inch MacBook Pro. Norton AntiVirus 2010 protects against viruses, spyware, and other threats for Windows-based PCs. For the cost calculation for a single Dell notebook, we include the price Symantec™ advertises for college students for a single-user license for Norton AntiVirus

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2010;[4] for quantities of 10 or more, we include the appropriate multiple of the price advertised at the Symantec site for a 10-user pack of Norton AntiVirus 2010;[5] for the Apple 15-inch MacBook Pro, we include the price Symantec advertises for college students for a single-user license for Norton Antivirus 11 for Mac.[6]

## Battery replacement costs

We include the cost of one battery replacement for each notebook during the projected 5-year lifespan of the device. The Apple 15-inch MacBook Pro requires in-store replacement of the built-in battery; we use the estimate of that service cost from the Apple Web site. We use the price of a 3-year battery warranty to estimate the replacement cost of the Dell Latitude E6510 battery.

## Additional possible Dell savings

We configured the Dell Latitude E6510 with some optional features that add to the configuration cost:
- a 15.6-inch HD+(1,600x900) Wide View Anti-Glare LED for $79 more than the HD(1,366x768) Anti-Glare LED on the base model
- a 512MB NVIDIA NVS 3100M graphics for $69 more than Intel HD Graphics option
- 4GB memory for $45 more than the 3GB memory option
- a BlueTooth module for $19
- a backlit keyboard for $49
- a Webcam for $30
- an 8X DVD+/-RW for $53 more than a 8x DVD drive option
- a 320GB 7,200 RPM hard drive for $80 more than the 160GB hard drive option
- Intel Centrino Advanced-N 6200 802.11a/b/g/n Half Mini Card for $20 more than the Dell Wireless 1501 802.11b/g/n Half Mini Card option

We selected these options to match features in the Apple 15-inch MacBook Pro base configuration. While these features are not optional on the Apple 15-inch MacBook Pro, they are on the Dell Latitude E6510. Schools that do not need these features could garner significant additional savings for the Dell solution by omitting them.

## Other cost factors to consider

We do not include IT costs for filtering software, imaging, and other management software in this analysis because those costs would vary depending on the current infrastructure. IT should consider these potential

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[4] Student pricing at: http://www.symantec.com/norton/student_campaign.jsp
[5] http://buy.norton.com/estore/mf/multiUserPack
[6] Student pricing at: http://www.symantec.com/norton/student_campaign.jsp

costs when planning a migration. We include productivity software, but no other application software because different schools, grades, and classes have unique application software needs. We also omit OS update costs, which depend on the number of updates the vendors release during the 5-year timeframe of this TCO analysis and on the willingness of the school system to implement the update.

## Management software

Like corporate notebooks, the Dell notebooks can be managed either by end-users or by IT staff. Server-based management software can enforce policies and lock the user systems down, allowing IT to control usage such as setting time restrictions and blocking the ability to install additional software. IT should be able to manage the new Dell Latitude E6510 notebooks using the same software used to manage the end-of-life notebooks. If this management software does not support the Apple 15-inch MacBook Pro devices, the school system selecting the Apple 15-inch MacBook Pro will need to replace or add onto the current management software.

## Filtering software

For this analysis, we assume that the K-12 school system's IT already has a centralized Web-filtering solution compliant with Children's Internet Protection Act (CIPA) laws and safeguarding students' Internet access on school-supplied devices and compatible with the Windows OS and Internet Explorer® browser on the Dell Latitude E6510. Depending on whether the school system's current filtering solution supports the Apple 15-inch MacBook Pro and its browser, IT may have to purchase and implement a new Web filtering solution compatible with the Apple 15-inch MacBook Pro and a browser that works with the filtering solution.

## Imaging

We do not include costs for initial setup and imaging for the two devices. These costs would vary depending on whether IT does the setup using staff, student volunteers, or paid student help, and how much IT automates the process. The Dell Latitude E6510 should be compatible with the school system's imaging software for its current Windows-based notebooks.

In a typical scenario for the Dell Latitude E6510 systems, IT would create images using Norton Ghost™ from Symantec or other imaging software and would reinstall those images the summer before each school year; the images would include OS software, filtering software, productivity software, security software, and application software.

IT will need to purchase new imaging software if the school acquires Apple 15-inch MacBook Pro systems and those systems are incompatible with the existing imaging software.

## Application software

We include Microsoft Office 2007 – Home and Student Editions for the Dell Latitude E6510 systems and Microsoft Office 2008 for Mac for the Apple 15-

inch MacBook Pro systems. Unique curriculum needs of each school system will determine other software needs. The Dell Latitude E6510 supports a wide range of Windows-based educational software programs and should be able to support any of those programs that the school system wants to transfer from their end-of-life systems.

### OS updates

We do not include costs for OS updates for either the Genuine Windows 7 Professional, 32-bit version on the Dell Latitude E6510 or the Mac OS X v10.6 Snow Leopard OS on the Apple 15-inch MacBook Pro.

### Training

The Dell Latitude E6510 solution should require few updates to training tools and usage procedure manuals for the notebook program. Students and teachers familiar with the old notebooks will need only minimal training on how to use the new Dell Latitude E6510 devices. The school system may choose to add new applications, which would require additional training, to the Dell Latitude E6510 solution, but that decision is an option based on curricular needs, not a requirement of the new hardware. IT would have to develop a new set of training tools and usage procedures for the Apple 15-inch MacBook Pro, and students and teachers familiar with the old notebooks would require retraining on the new devices and usage procedures on the Apple 15-inch MacBook Pro.

### Hardware support costs

We priced the two systems' configurations in the Dell and Apple retail sites for the education market. The base configuration for both systems includes a limited warranty. We omit additional support costs.

The configuration tools on both retail sites allow you to purchase additional support for additional cost. The Apple Web site includes the option to add 3-year AppleCare® protection for the Apple 15-inch MacBook Pro. In addition to the 3 Year Basic Limited Warranty and 3 Year Next Business Day Onsite Service that we include in our pricing, Dell includes prices for six support packages for the Dell Latitude E6510 that add support services and extend support coverage up to 5 years.

Instead of choosing one of the support options available on the retail site, we expect that if the school system were buying either the Apple 15-inch MacBook Pro or the Dell Latitude E6510 systems in bulk, they would negotiate with the vendor a custom support package that fit their needs and that included some combination of spare parts, replacement devices, telephone support, on-site repairs, and support management software; the lowest-price support options minimize the amount of on-site repair required of the vendor and lengthen the response time for that repair.

We assume that the vendor will bundle hardware and support and calculate the bulk-buy savings percentages based in part on the support level they require. We leave these percentages out of the analysis as we did the bulk-buy percentages themselves.

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# Conclusion

As we show in this Guide, a school, school district, or university can realize savings by purchasing Dell Latitude E6510 notebooks over Apple 15-inch MacBook Pros for a one-to-one notebook program.

The Dell system could save $125 for a single system or $150 per system in quantities of 10 or more over a projected 5-year system lifespan compared to the Apple system.

The Dell Latitude E6510 not only brings significant savings in hardware and software costs over a 5-year period, but also provides familiarity for staff and students moving from a current Windows-based notebook program to the new Dell systems. Considering several cost factors, we find the Dell Latitude E6510 to be the more economical purchase option.

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## About Principled Technologies

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We provide industry-leading fact-based marketing and technology assessment services that help technology vendors and buyers understand the real differences among products. We bring to every assignment extensive experience with and expertise in all aspects of technology marketing, testing, and analysis; from researching new technologies, to developing new methodologies, to testing with existing and new tools, to delivering the results in whatever form best communicates them.

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, white papers, PowerPoint presentations, and videos. Every piece of collateral reflects the results of our trusted independent analysis.

We customize our services to focus on each client's requirements. Whether the technology involves hardware, software, Web sites, or services, we offer the experience, expertise, and tools to assess how it will fare against its competition and to highlight its strengths.

Our founders, Mark L. Van Name and Bill Catchings, have worked together in technology assessment for 25 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.