

Out-of-box comparison between Dell and HP blade servers

Executive summary

Dell Inc. (Dell) commissioned Principled Technologies (PT) to compare the out-of-box experience of a Dell PowerEdge 1955 Blade System with that of an HP BladeSystem c-Class. We received each chassis and set of blades in the manufacturer's original packaging. We then compared the amount of time it took us to set up each system. Due to differences in packaging and design, there was a considerable difference in setup times for the two systems.

Figures 1A and 1B show the components of the two server arrays after we unpacked them. These photographs illustrate the difference in the time and effort required to set up the two blade servers. The Dell blades were preconfigured and all necessary components were up and running as soon as we plugged in the enclosure and put in the blades. HP shipped the second processor, extra RAM, and hard drives separately; the total of 78 boxes made the unpacking and setup time for the HP blade servers much longer than that for the Dell blade servers.

KEY FINDINGS

- The 10-blade Dell PowerEdge 1955 Blade System took 1 hour, 5 minutes, 45 seconds to assemble; the 16-blade HP BladeSystem c-Class took 3 hours, 34 minutes, 15 seconds to assemble—more than three times as long as the Dell system.
- The Dell PowerEdge 1955 Blade System shipped with the blades already assembled and installed in the enclosure; the HP BladeSystem c-Class arrived unassembled and required us to install a processor, memory, and hard disk in each blade.
- The Dell PowerEdge 1955 Blade System arrived in 2 boxes; the HP BladeSystem c-Class arrived in 78 boxes.



Figure 1A: The Dell equipment immediately after we unpacked it.



Figure 1B: The HP equipment immediately after we unpacked it.

Figure 2 summarizes the amount of time we spent unpacking each system, installing it in the server rack, and powering it on. The process for the HP system took more than three times longer than that for the Dell.

	Dell PowerEdge 1955 Blade System	HP BladeSystem c-Class
Task executed		
Removing items from shipping boxes	13:30	58:45
Installing the server in the rack	47:45	2:30:00
Powering on the system	4:30	5:15
Total time required	1:05:45	3:34:15

Figure 2: Time to unpack, install, and power on both systems. Times are in hours: minutes: seconds. Shorter times are better.

Test results

In this section, we detail our experience setting up the Dell PowerEdge 1955 Blade System and the HP BladeSystem c-Class enclosures, from the time each system arrived through our installation of all of its blades in the chassis and the chassis in a server. We discuss this process in the following stages:

- Receiving the system
- Removing system components from their packaging
 - Opening and removing parts from shipping boxes
 - Removing components and server from outer shipping box
 - Removing plastic wrap and foam pieces from server
 - Removing chassis from pallet
- Installing the system in the server rack
 - Installing rails and mounting chassis into server rack
 - Installing blades into chassis
 - Installing power distribution unit (PDU) and cables
- Powering on the system

For each stage and sub-stage after we received the systems, we enumerate the steps we took, note the amount of time each step took, and provide representative photographs.

Receiving the system

Dell

As Figure 3A shows, the Dell shipment consisted of two boxes: a large box strapped to a pallet and a smaller box.

The shipping service delivered both boxes to our second-floor lab.

HP

As Figure 3B shows, the HP shipment consisted of 78 boxes. Upon arrival at our building, the large box was strapped to a pallet and the 77 smaller boxes were attached to a large pallet with plastic wrap.

Because the large pallet could not fit into the elevator to our second-floor office, we had to unwrap the pallet in the lobby and make multiple elevator trips to bring the smaller boxes up to our lab. (Note: We did not time the process of transporting the 77 smaller boxes.)



Figure 3A: The Dell boxes upon delivery in our lab.



Figure 3B: The HP boxes after we brought them up to our lab.

Removing the system components from their packaging

Opening and removing parts from shipping boxes

Dell

1. Opened and started reading instructions. (1:30)
2. Cut off the straps, then cut through the tape to open the top of the box. (0:30)

Total time: 2 minutes



Figure 4A: Opening the Dell server box.

HP

1. Opened the hard disk boxes and placed them on the table. (17:00)
2. Opened the blade server boxes and placed the blade servers on the table. (10:30)
3. Opened the blade kit boxes and placed the processors and heat sinks on the table. (15:00)
4. Opened the RAM box and placed the RAM on the table. (1:45)
5. Opened the Ethernet switch box and placed the switch on the table. (2:00)
6. Opened the fan boxes and placed the fans on the table. (6:00)
7. Opened the PDU boxes and placed items on the table. (3:00)
8. Cut off the straps, then cut through the tape to open the top of the box. (0:30)

Total time: 55 minutes, 45 seconds



Figure 4B: Opening the HP server box.

Removing components and server from outer shipping box

Dell

1. Removed the topmost box and set it aside. (0:45)
2. Removed the outermost cardboard covering. (0:30)

Total time: 1 minute, 15 seconds

HP

1. Removed the topmost boxes and the template for inserting the enclosure onto the rack and set them aside. (1:15)
2. Removed the foam padding from the top of the server. (0:30)
3. Removed the outermost cardboard covering. (0:30)

Total time: 2 minutes, 15 seconds

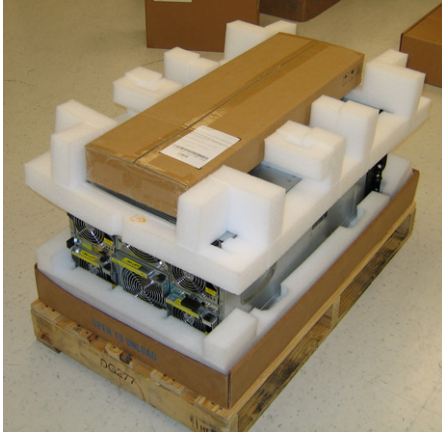


Figure 5A: The Dell server with outer cardboard covering removed.

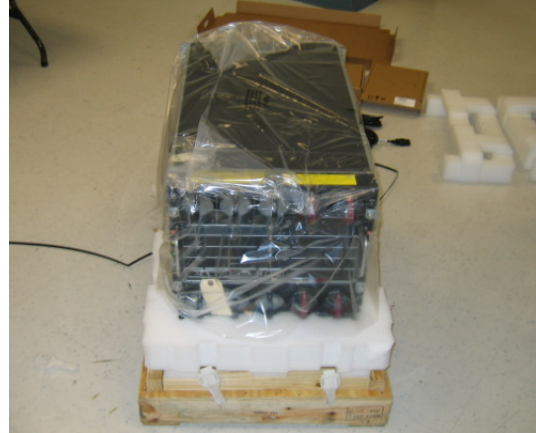


Figure 5B: The HP server with outer cardboard covering removed.

Removing plastic wrap and foam pieces from server

Dell

1. Removed the second box and set it aside. (0:30)
2. Removed the foam pieces from the Dell blade system. (1:00)

Total time: 1 minute, 30 seconds

HP

1. Removed the corner pieces and set them aside. (0:15)
2. Removed the plastic wrap around the server. (0:30)

Total time: 45 seconds

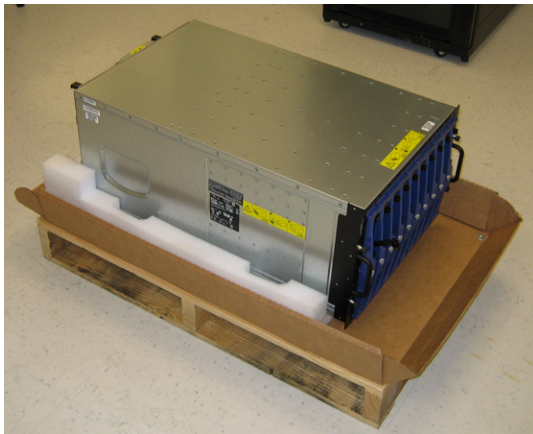


Figure 6A: The Dell server with foam pieces removed. The Drive 0, blade 1 drive was partially ejected.



Figure 6B: The HP server with plastic wrap removed.

Removing chassis from pallet

Dell

1. Opened the top box that we had removed and set aside earlier. (0:45)
2. Removed anti-static sheets from bag and placed them on a table. (1:00)
3. Removed the blades and set them onto anti-static sheets. (4:00)
4. Removed the power supplies. (2:00)
5. Lifted the chassis off the pallet. (1:00)

Total time: 8 minutes, 45 seconds

HP

1. Lifted the chassis from the pallet.(2:00)

Total time: 2 minutes, 0 seconds

Installing the system in the server rack

Installing rails and mounting the chassis in the server rack

Dell

Note: We followed the Getting Started with your System guide to install the chassis in the rack.

1. Removed the two instruction guides from the large box and began reading the Getting Started With Your System Guide. (1:00)
2. Referred to the User's/Installation and Troubleshooter's Guide, which contains only information about setting up the operating system and software. (1:00)
3. Switched back to reading the Getting Started with your System Guide. (2:00)
4. Opened the rails box and the power distribution unit box. (1:00)
5. Removed the foam from the rail box and unpacked the rails. (1:00)
6. Unpacked the power cords from the power distribution unit box. (1:15)
7. Read about rail installation.(1:00)
8. Installed the rails into the rack. (6:00)
Read the instructions for installing the chassis. (1:00)
9. Installed the chassis onto the rails. (1:00)

Total time: 16 minutes, 15 seconds

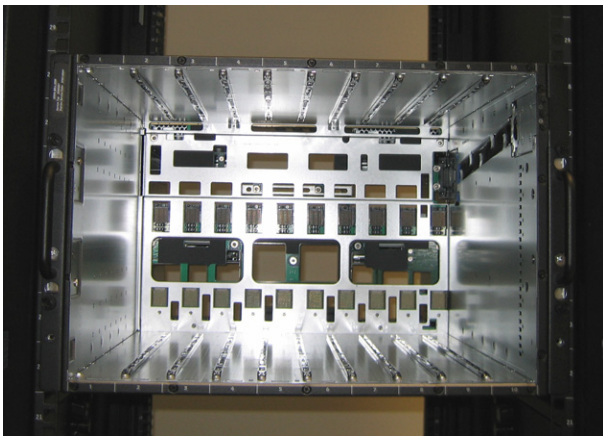


Figure 7A: The Dell chassis installed on the rails.

HP

Note: We followed the instructions on the template that was in the chassis box.

1. Removed the template and placed it on the rack. (1:00)
2. Opened the power supply boxes and placed the power supplies on the table. (6:00)
3. Installed screw holders into the rack. (0:45)
4. Installed the rails into the rack. (6:30)
5. Installed the chassis onto the rails. (3:45)

Total time: 18 minutes



Figure 7B: The HP chassis installed on the rails.

Installing blades and power supplies in the chassis

Dell

1. Returned to reading the instructions to install the blades and power supplies. (0:30)
2. Installed the blades and power supplies in the chassis. (5:00)

Total time: 5 minutes, 30 seconds



Figure 8A: The Dell blades installed in the chassis.

HP

1. Removed the power supply fillers from the chassis. (0:30)
2. Inserted the power supplies into the chassis. (1:45)
3. Referred to the installation poster for the next step. (1:30)
4. Removed the fan fillers from the chassis. (0:45)
5. Installed the fans into the chassis. (1:00)
6. Removed the module filler from the chassis. (0:15)
7. Inserted the onboard administrator module into the chassis. (0:30)
8. Installed the processor, RAM, and hard disks in the first blade server. (10:30)
9. Inserted the first blade server into the enclosure. (0:30)
10. Installed system 2 in the chassis. (8:15)
11. Installed system 3 in the chassis. (7:00)
12. Installed system 4 in the chassis. (6:45)
13. Installed system 5 in the chassis. (6:30)
14. Installed system 6 in the chassis. (7:30)
15. Installed system 7 in the chassis. (8:00)
16. Installed system 8 in the chassis. (7:30)
17. Installed system 9 in the chassis. (6:45)
18. Installed system 10 in the chassis. (6:15)
19. Installed system 11 in the chassis. (5:45)
20. Installed system 12 in the chassis. (5:15)
21. Installed system 13 in the chassis. (4:30)
22. Installed system 14 in the chassis. (6:00)
23. Installed system 15 in the chassis. (5:45)
24. Installed system 16 in the chassis. (5:30)

Total time: 1 hour, 54 minutes, 30 seconds



Figure 8B: The HP blades and power supplies installed in the chassis.

Installing the power distribution unit (PDU) and cables

Dell

1. Started reading instructions on installing the keyboard, mouse, and monitor cables. (1:00)
2. Unpacked the keyboard, mouse, and monitor cables and connected them as instructed. (1:00)
3. Attached the management system cables. (1:00)
4. Unpacked and installed the first PDU. (13:00)
5. Installed the second PDU. (7:00)
6. Unpacked and connected the power cords to the back of the unit. (3:00)

Total time: 26 minutes, 0 seconds

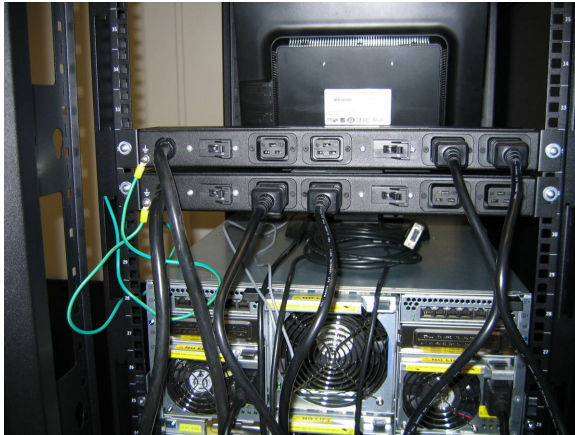


Figure 9A: The Dell system with the PDUs installed.

HP

1. Started reading instructions on installing the PDU. (2:00)
2. Unpacked the first PDU and installed it as instructed. (6:15)
3. Unpacked and installed the second PDU. (4:45)
4. Unpacked and connected the power cords to the back of the unit. (3:00)
5. Unpacked and connected the keyboard, mouse, and monitor cable to the front of the first blade. (1:30)

Total time: 17 minutes, 30 seconds



Figure 9B: The HP system with the PDUs installed.

Powering on the system

Note: For both systems, we followed the manufacturer's User Guide to power up the system.

Dell

1. Plugged the unit into an electrical outlet. (1:00)
2. Connected the first Ethernet cable to Bank 1. (0:30)
3. Pressed the power button on each of the server modules. (1:00)
4. Waited while the systems powered up. (2:00)

Total time: 4 minutes, 30 seconds

HP

1. Plugged the unit into an electrical outlet. (1:00)
2. Connected the first Ethernet cable to Bank 1. (0:30)
3. Waited while all systems powered up. (3:45)

Total time: 5 minutes, 15 seconds

Test methodology

We attempted to recreate the way a typical buyer would set up a chassis of blade servers. We generally followed the instructions the vendors provided in their packaging. Occasionally, such as when we were opening the boxes, we had to use our own judgment, but whenever possible, we followed the vendors' instructions.

As one person executed the tasks, another person documented the process by recording the steps, timing each step, and photographing as many steps as possible.

Appendix A – Enclosure configuration information

This appendix provides detailed configuration information about the enclosures, which we present in alphabetical order.

Enclosure	Dell PowerEdge 1955 Blade System	HP BladeSystem c-Class
General dimension information		
Height (inches)	12.0	17.5
Width (inches)	17.5	17.5
Depth (inches)	29.0	31.0
U size in server rack	7	10
Number of blades	10	16
Power supplies		
Total number	4	6
Wattage of each	2100	2250
Cooling fans		
Total number	4	10
Dimensions (H x W) of each	5.5 x 5.5	3.5 x 3
Voltage	24 volts	12 volts
Amps	2.3 amps	16.5 amps

Appendix B – Blade system configuration information

This appendix provides detailed configuration information about the blade server systems, which we present in alphabetical order.

Servers	Dell PowerEdge 1955 blade server	HP ProLiant BL460c
General processor setup		
Number of processor packages	2	2
Number of cores per processor package	4	4
Number of hardware threads per core	1	1
System Power Management Policy	Always On	Always On
CPU		
Vendor	Intel	Intel
Name	Quad-Core Intel Xeon processor X5345	Quad-Core Intel Xeon processor X5345
Stepping	7	7
Socket type	LGA 771	LGA 771
Core frequency (GHz)	2.33 GHz	2.33 GHz
Front-side bus frequency (MHz)	1333 MHz	1333 MHz
L1 Cache	32 KB + 32 KB (per core)	32 KB + 32 KB (per core)
L2 Cache	2 x 4MB (each 4MB shared by 2 cores)	2 x 4MB (each 4MB shared by 2 cores)
Platform		
Vendor and model number	Dell PowerEdge 1955	HP ProLiant BL460c
Motherboard model number	Dell 0MY759	HP 435458-B21
Motherboard chipset	Intel 5000P	Intel 5000P
Motherboard revision number	A00	91
BIOS name and version	Dell 1.1.0 10/18/2006	HP I15 12/26/2006
BIOS settings	Disabled Hardware Prefetcher and Adjacent Cache Line Prefetch	Disabled Hardware Prefetcher and Adjacent Cache Line Prefetch
Chipset INF driver	7.3.0	HP 2.1.8
Memory module(s)		
Vendor and model number	Hyundai HYMP512F72BP8N3-Y5	Micron MT18HTF12872FDY
Type	PC2-5300	PC2-5300
Speed (MHz)	667 MHz	667 MHz
Speed in the system currently running @ (MHz)	667 MHz	667 MHz
Timing/Latency (tCL-tRCD-iRP-tRASmin)	5-5-5-15	5-5-5-15
Size	4 GB (4 x 1GB)	4 GB (4 x 1GB)
Number of RAM modules	4	4
Chip organization	Dual side	Dual side

Servers	Dell PowerEdge 1955 blade server	HP ProLiant BL460c
Hard disk		
Vendor and model number	Fujitsu MAY2073RC	Seagate St973402SS
Number of disks in system	2	2
Size	73 GB	72 GB
Buffer Size	16 MB	16 MB
RPM	10,000	10,000
Type	SAS	SAS
Controller	Dell SAS 5/iR Integrated controller	Smart Array E200I controller
Controller driver	Dell 1.21.8.0	HP 6.6.0.64
Operating system		
Name	Microsoft Windows Server 2003, Enterprise Edition	Microsoft Windows Server 2003, Enterprise Edition
Build number	3790	3790
Service Pack	SP 2	SP 2
Microsoft Windows update date	SP 2 only	SP 2 only
File system	NTFS	NTFS
Kernel	ACPI Multiprocessor-based PC	ACPI Multiprocessor-based PC
Language	English	English
Microsoft DirectX version	9.0c	9.0c
Graphics		
Vendor and model number	ATI ES1000	ATI ES1000
Chipset	ATI ES1000	ATI ES1000
BIOS version	BK-ATI VER008.005.028.000	BK-ATI VER008.005.013.000
Type	Integrated	Integrated
Memory size	16MB	32MB
Resolution	1024 x 768	1024 x 768
Driver	ATI 8.19.4.0	ATI 8.24.3.0
Network card/subsystem		
Vendor and model number	Broadcom BCM5708S NetXtreme II Gigabit Ethernet adapter	HP NC373i Multifunction Gigabit Server Adapter
Type	Integrated	Integrated
Driver	Broadcom 2.6.14.0	HP 3.0.5.0
Optical drive		
Vendor and model number	None installed	None installed
USB ports		
Number	2 (with adapter attached)	2 (with adapter attached)
Type	USB 2.0	USB 2.0



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