



CATbench Update

Winter 2005

Workstation & Mobile Benchmark

The Best of Mobile Computing vs. the Best of UNIX: How Do They Compare?

By Phil Harrison

Editor's note: This is the final update in the CATIA Community's sixth annual workstation benchmark, CATbench 2004, testing machines with CATIA Version 5 Release 12. In this update column, reviewer Phil Harrison tests Dell's new M70 mobile Workstation & IBM's Intellistation Power 275. Look for the CATbench 2005 Annual Benchmark, using V5 R13, this spring.

In this, our winter update column, we test a Dell M70 Mobile workstation & an IBM Intellistation Power 275 (RS/6000).

To ensure that the results of this update are comparable with those from the main benchmark, all systems were loaded with CATIA Version 5 Release 12 SP4 and tests were performed in an identical manner. When it came to results analysis, we used the same test weightings as in the main benchmark effort and did not re-compute the average system scores.

The CATIA Community's CATbench 2004 benchmark issues four ratings:

- CATbench2004S measures the performance of the CPU, Bus and I/O subsystems,

- CATbench2004G measures the graphics performance of each system,
- CATbench2004 is the combination of CATbench2004G and CATbench2004S, giving each equal weighting to both system and graphics performance.

CATbench2004DMU: The Digital Mock Up (DMU) results are not included in the System performance measurement, but are used to create a separate measurement specific to DMU. We apply the same relative graphics/DMU weight factors as applied to our overall results to create our DMU performance measure.

With no financial restrictions, any vendor can put a system together that is fast. The CATIA Community feels that price/performance also should be taken into account. For this reason, all systems will be compared on two variables, one rating systems on a pure performance basis and the other taking prices into consideration. Our rating system is as follows:

***** = Excellent
**** = Good
*** = Average
** = Below Average
* = Poor

Table 1 gives prices and detailed system specifications for each of the systems submitted for this CATbench 2004 update. A summary of the results for the four workstation systems tested can be found in Table 2. These results also are displayed in Graphs 1, 2, 3 and 4 for overall (CATbench2004), graphics (CATbench2004G), system (CATbench2004S), and Digital Mock-Up (DMU) (CATbench2004DMU) performance respectively. We have left the original machine results in CATbench2004 graphs for comparison. Table 3 shows the results of the Dell M70 for our Mobile benchmark, CATBench2004M.

System Features and Results



Copyright Dell Computers, 2005.

Dell Precision M70 Mobile Workstation

Dell's M60 workstation has impressed us for the last two years with both its performance & price. Dell has again taken the lead by evolving the system with Intel's new 915 PM chipset with a 2.13 GB Intel Pentium M processor. In addition, to squash any graphics concerns, the graphics adapter provided is now NVIDIA's Quadro FX Go 1400 with a massive 256 MB of memory. The system is packaged in a chassis very similar to that of the M60, but an attractive graphic has been added to the screen's magnesium cover.

As usual, we decided to run the system through the CATbench2004 benchmark (where we could compare it to desktop/tower systems) and also

run the system through our mobile benchmark CATbench2004M so we could compare the M70 to other mobile systems. The main difference in the benchmarks is the addition of a battery life test. We also take weight into consideration in the mobile benchmark.

For CATbench2004, we set the mobile workstation's screen resolution at 1280 x 1024 pixels as compared to the Dell M60's native 1920 x 1200 pixel display. Thanks to a magnesium case, the M70 weighs a reasonable 8.3 lbs even with the extra wide aspect ratio 15.4" display. In the configuration tested, the M70 came with 1 GB of RAM and a 60GB 7,200 RPM Ultra ATA 100 hard disk. The system also came with a CD-RW that will be useful for back-ups in the fixed bay. The system includes an integrated mini-PCI wireless network card and a 56K modem. The configuration is feature packed for the mobile worker who needs access to CATIA. The display was stunning, with a 15.4" screen with a resolution of 1920 x 1200 pixels.

The M70 comes with a touch pad and a pointing device, so we added a 3-button mouse to take advantage of CATIA's mouse manipulations. We were a little disappointed with the results of the battery life test of the Dell machine, which ran our battery test for 90 minutes, some 25% less than that of the M60 we tested in our main CATBench2004 article last spring.

The system performance of the M70 quite honestly surprised us with a CATbench2004 score of 105.8 - 9.5 points slower than the M60 with the 2.0 GHz processor & 855PM chipset. In fact, if you look at Graph 3, it's readily apparent that system performance has hit a plateau. That's why Intel and AMD are now investing heavily in dual-core technology; however that will only be of benefit to multi-processor enabled applications. Where the M70 did improve dramatically over the M60 is

in graphics performance with the NVIDIA Quadro FX G0 1400 achieving a score of 85.7, almost on a par with the best of the single processor workstations & a full 15 points ahead of the previous FX Go 1000 card.

Combining the System & Graphics score gives a CATbench2004 rating of 95.7, while the CATbench2004DMU score is a similar rating of 94.1; demonstrating once again that these mobile workstations can now be used as replacements for desktop CAD workstations.

At \$3,575 the Dell M70 raises the bar for mobile computing with its stunning display; it is a lightweight machine with excellent performance all around. It is the ideal machine for mobile workers and offers performance comparable to leading desktop workstations. It is the first mobile workstation that we have awarded a 4 star price performance rating.

Price/Performance 4 stars ****
 Performance 4 stars ****



Copyright IBM, 2005.

IBM Intellistation Power 275

Or should we say the workstation formally known as the RS/6000. Let me say that none of the UNIX system vendors have ever been keen in us comparing their UNIX systems against Wintel systems. In terms of price/performance they just can't compete. But companies that have legacy Version 4 data, or those using VPM with CATIA Version 5 are stuck with CATIA on UNIX for

some time to come. Therefore we thought it important to test one of the best UNIX systems and to see exactly how it performed.

The RS/6000 (sorry, Intellistation Power 275!) comes in what can only be described as a massive chassis with the capacity for up to 7 hard drives (4 hot swappable). There is a relatively noisy cooling fan, and the RS/6000 really does emit some heat - clearly this is a server case.

The particular model we chose to test housed a single 1.45 GHz Power 4 processor and 3 GB of memory; it used an Ultra 320 SCSI controller with a 10,000 RPM disk drive.

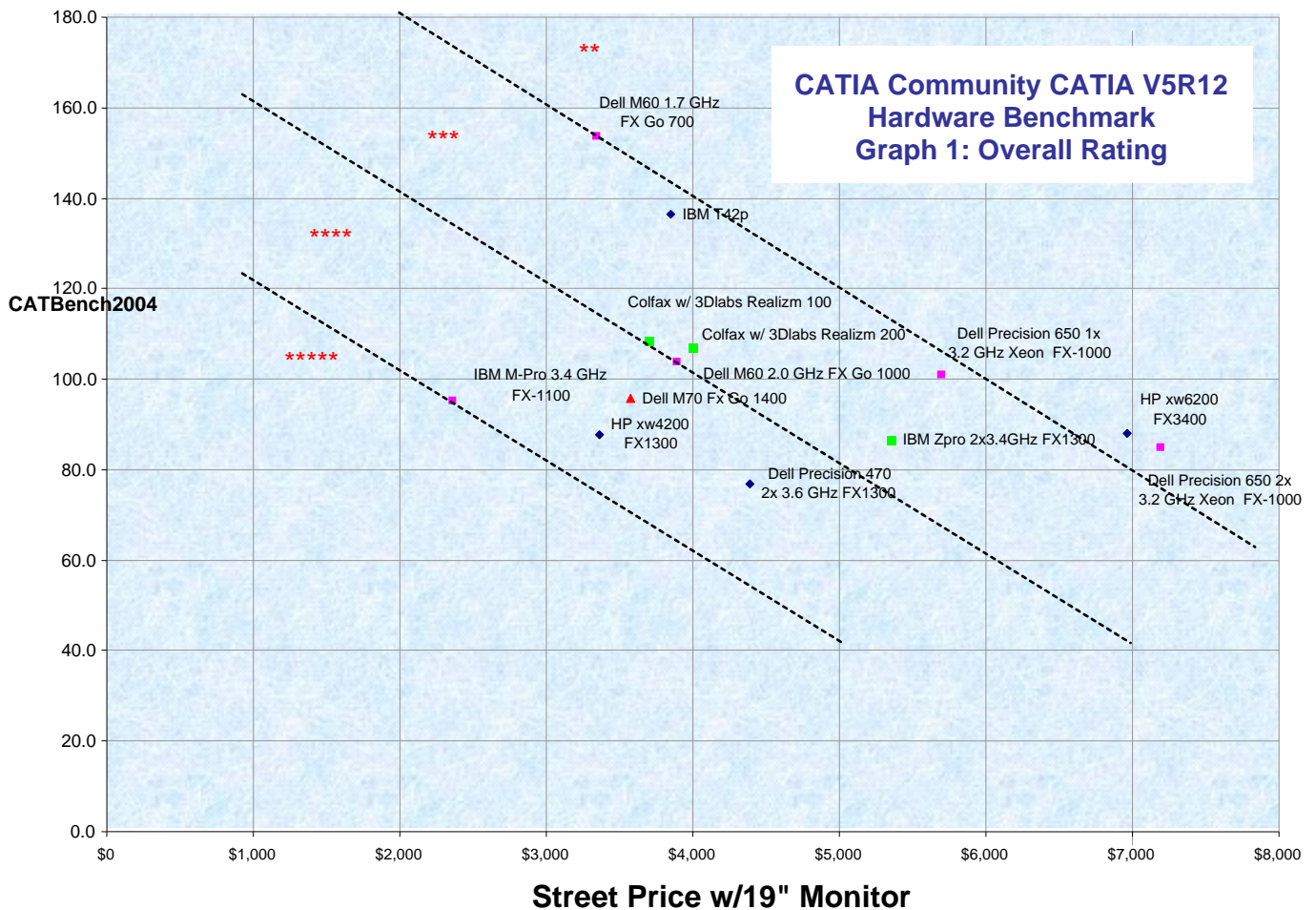
System performance was disappointing, with a CATBench2004 score of 190.1; performance was slow across all scenarios except our stress analysis tests. Graphics performance was also disappointing with an overall score of 236. That's nearly three times slower than the Dell M70 we tested. The GXT6500 seemed to particularly struggle on our shaded mode tests. Combining the System & Graphics tests we calculate a CATBench2004 score of 213.1.

The DMU performance of the RS/6000 was 283.5, which combined with the graphics score gives us a CATBench2004DMU score of 259.5. At a cost of approximately \$16,000 the Intellistation Power 275 is considerably slower than Wintel workstations while it is several times more expensive.

Price/Performance 1 star *
 Performance 1 star *

Conclusion

The Dell M70 mobile workstation demonstrated that laptops can be a replacement for more traditional workstations, once again raising the



bar for other mobile workstation manufacturers to meet or beat. The IBM Intellistation Power 275 performed approximately 2-3 times slower than Wintel systems that we've tested this year, while costing 3-5 times more. However, existing CATIA Version 4 customers will be faced with the need to operate CATIA V4 and V5 on the same workstation for some time to come, so UNIX workstations will still be needed. We hope that we have provided a valuable data point.

Look for our CATBench2005 Annual CATIA Version 5 hardware benchmark using CATIA Version 5 Release 14 in the spring.

Phil Harrison is principal of LionHeart Solutions, Inc., a consulting firm specializing in CATIA and ENOVIA implementation and usage located in Cold Spring Harbor, NY. Harrison is President of the CATIA Operators Exchange (COE). He also is the author of the CATIA Community's CATbench CATIA Version 5 Hardware Benchmark. Harrison has 15 years' experience installing and using CATIA on Unix, mainframe, and Windows systems. He can be reached via e-mail at pph@lionheartsolutions.com.

(Continue to pages 6-9 for Tables and Graphs 2-4).

Table 1: System Specifications

Vendor	Dell	IBM
Model Number	Dell Precision M70	RS/6000 9114-275 Intellistation Power 275
Phone Number	1-(800)-WWW-DELL	1-(888)-SHOP-IBM
Web site	www.dell.com	www.ibm.com
CPU Type	Intel Pentium M (Centrino)	Power 4
CPU Speed	2.13 GHz / 800 MHz	1.45 GHz
I/O Bus	533 MHz FSB	PCI-x
# of CPU's (Max. #)	1 (1)	1 (2)
Chip Set	Intel 915 PM	Proprietary
Graphics Card	Nvidia FX Go 1400	GXT6500P
Graphics driver	BIOS 5.41.02.17.17 Driver 6.14.10.6771	
Chips set	nVIDIA	Proprietary
Bus type	PCI Express	PCI 66 MHz
Video RAM	256 MB	128 MB
Graphics Output	VGA	DVI
Resolution for test	1920x1200 60 Hz	1600x1200 60 Hz
Number of colors for test	32 bit	16.7 Million
Monitor size	15.4" WUXGA Wide aspect screen	IBM Thinkvision L200p 20" LCD
Memory (maximum)	1 GB (2 GB)	3 GB (16 GB)
Slots Used (total)	1 (2)	8
Memory type	533 MHz DDR2 SDRAM	DDR SDRAM
Virtual memory	3 GB	4 GB
Disk size/type	60 GB UATA 7200 rpm HTS726060M9AT00	73.4 GB 10,000 RPM
Bus type	Serial ATA	Ultra 320 SCSI
Controller	Integrated Intel 82801FBM UATA	SCSI 3
File system type	NTFS	AIX
Free Storage Bays	0	6
Network card Ethernet	Intel Pro/Wireless lan 2100 3a mini PCI Broadcom NetXtreme 57xx Gbit Wireless	Integrated 10/100 + 10/100/1000
Ports Serial + Parallel + 1394	1+1+1	3+1+0
USB	2 on rear, 2 on side	None
Sound Inputs/Outputs	Headphone socket sound out on side	Headphone socket sound in/out on rear
PCI Slots Available	1	4

Unique Features	Infrared Port Integrated Wireless Networking	Massive Case 64 bit UNIX 4 Hot swappable disk bays
As configured	CD/RW DVD	DVD/ROM
Dimensions Height x Width x Depth(mm)	38.1 x 358 x 273	533x201x651
Software packaged with the machine	Dell Bundle incl. Internet Explorer	AIX 5.1 + Bonus Pack
Technical support	24-7/365 Dedicated Phone Support	Available
Warranty	3Yr Parts + Onsite Labor (Next Business Day)	3Yr Parts + Onsite Labor (Next Business Day)
OS/software	Windows XP Pro SP2	AIX 5.1
Dassault Certification	In Process	Complete
Street price w/19" monitor as of 6/16	\$3,575	Approx. \$16,000

Table 2 - Results Summary

	<i>Dell M70 Mobile Workstation 2.13 GHz FX Go 1400</i>	<i>IBM Intellistation Power 275 - RS/6000 275 1.45 GHz GXT6500P</i>
Graphics		
Shaded+Edge	85.4	213.0
Shaded	79.3	331.9
Edges	92.3	163.1
CATBench2004G	85.7	236.0
System		
Piston	116.4	182.3
Crankshaft	94.3	219.3
Engine Block	79.1	217.8
Engine Assembly	172.4	186.2
Migration	80.6	221.1
Analysis	94.7	129.3
CATBench2004S	105.8	190.1
CATBench2004	95.7	213.1
DMU	102.5	283.05
CATBench2004DMU	94.1	259.5
Cost	\$3,575	\$16,000

Table 3 - Mobile Results Summary

Dell M70 Mobile Workstation 2.13 GHz FX Go 1400	
Graphics	
Shaded+Edge	74.6
Shaded	67.4
Edges	78.8
CATBench2004MG	73.6
System	
Piston	116.4
Crankshaft	94.3
Engine Block	79.1
Engine Assembly	172.4
Migration	80.6
Analysis	94.7
CATBench2004MS	105.8
Battery Life	131.0
Weight	98.2
CATBench2004M	94.7
DMU	102.5
CATBench2004DMUM	88.1
Cost	\$3,575

