

Computing Hardware and Software at EPAC06

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This is a summary of the computing hardware and software systems used during EPAC06, which was held in June 2006 at the Edinburgh International Conference Centre (EICC), Edinburgh, UK

Conference IT Hardware

An EPAC conference requires a substantial amount of IT hardware and we were fortunate that the ISIS facility at CCLRC Rutherford Appleton Laboratory was able to loan us most of this (PCs, network switches, printers) free of charge. This provided a significant cost saving over renting the equipment and we are most grateful. The only hardware we needed to rent was two Apple Macintosh PowerPC G5 computers for the proceedings office and two laptops for the speaker timer system. We had hoped we would be able to use the newer (and smaller) Intel based Apple Macintosh computers rather than G5s, but we were unable to make all the editing software function correctly on the Intel platform.

ISIS had recently purchased 50 new PCs which we were able to use at the conference and which were later distributed to staff and also used to replace older pool PCs. The machines all had the same base hardware configuration, but 15 had a Small Form Factor (SFF) chassis and 35 were MiniTowers (MT). The specifications were:

Common to both:

- 1GB DDR2 SDRAM Memory
- 160GB (7200rpm) Serial ATA II Hard Drive
- Intel® Graphics Media Accelerator 950
- 100 MBit RJ45 integrated Ethernet card
- USB keyboard and mouse

15 x Small Form Factor (SFF):

- Intel® Pentium® 4 Processor with Hyper-Threading Technology 630 (3GHz, 800MHz FSB, 2MB L2 cache)
- 24X DVD-ROM/CD-RW Combo Drive
- 19" Flat Panel Monitor with height adjustable stand and ability to rotate into either landscape or portrait orientation
- 7 USB connectors (2 front, 5 back)

35 x MiniTower (MT):

- Intel® Pentium® 4 Processor with Hyper-Threading Technology 650 (3.4GHz, 800MHz FSB, 2MB L2 cache)
- 16X DVD+/-RW Drive
- 19" Flat Panel monitor
- 8 USB connectors (2 front, 8 back)

Note that there was no 3.5" floppy disk drive on either of these computers – we took along two portable USB external floppy drives to provide such access, but these were

never required. A USB 7-in-1 card reader was also made available and this was used on several occasions.

The 15 SFF computers were set up and used as proceedings office machines – they were light and easy to transport, which was useful when the proceedings office was moved to the main conference centre on the Sunday. The 35 MT computers were configured as Internet café computers. In addition 5 older, less powerful, Compaq iPAQ computers were brought along for use at the registration desk.

Two servers (the main and a backup) running Windows Server 2003 SP1 were used locally to provide a network file store for editors and also print queue services. The main server had a 2.4 GHz Intel Xeon CPU, 1Gb memory and a disk array configured as RAID5 with a hot spare; it was also attached to a portable Uninterruptable Power Supply (UPS). Data on the main server was backed up to both an external USB hard drive and to the second server regularly during the conference.

Main printing was provided by three networked Xerox Phaser 8500/ADN duplex colour printers (two exclusively for editor use, one for the Internet café). Print queues were created on the Windows 2003 servers, with the editor print queues protected from access by Internet café computers. A small Epsom printer/scanner/photocopier was attached to one of the iPAQ computers at the registration desk for printing receipts etc.

To summarise, there were in total:

- 15 PCs, 2 Macs, 2 printers and 2 servers in the proceedings office
- 1 Mac and 5 PCs in the paper reception office
- 4 PCs + 1 small printer/scanner/photocopier at the registration desk
- 29 PCs and 1 printer in the Internet cafe
- 1 Macintosh G5 and 1 printer as spares

Computer Installation

For both Internet café and proceedings office computers a master template computer was configured and used to clone the rest of the computers. The two clone images would work on either of the two computer types due to their similar hardware; a café computer could be re-imaged into a proceedings office machine in around 15minutes in the event of a hardware failure at the conference. The images were created using Microsoft sysprep and installed via Symantec Ghost. Many machines could be cloned in parallel using Ghost multicasting and PXE network booting removed the need for a startup boot disk; re-image could be initiated with just a few keystrokes on each target computer.

Once the master template computer had been initially configured, it was placed on the network for checking by the relevant parties. Using Microsoft remote desktop across a Virtual Private Network (VPN) colleagues at Daresbury and CERN were able to access the master computers to check and modify their configuration. The file/print server was also set up at this time so the appropriate print queues, printer drivers and network drives could be configured and a complete mini proceedings office tested pre-conference. When everything was correct, a clone was created and used initially to image 4 proceedings office PCs. These PCs were then placed on the network and software that accessed network licences (such as Enfocus PitStop) was tested in

parallel to check for licensing conflicts. When everything was satisfactory, the remainder of the machines could be cloned.

Rutherford Appleton Laboratory is a fair distance from Edinburgh and making the journey there and back in a day is impractical. Daresbury laboratory is much closer, but it is still a full day's drive from there to Edinburgh and back. Temporary storage facilities were arranged at Daresbury laboratory and the editing computers and one third of the Internet café were cloned and transported there about a month before the conference. The timetable for the pre-conference week was then:

Monday (pre conference)	Transport remaining computers to Daresbury laboratory
Tuesday	Transport pre-conference editing computers from Daresbury to Edinburgh and begin setup in the afternoon in conference house, a separate building close to and owned by the EICC
Wednesday	Complete setup for pre-conference proceedings editing
Thursday	Pre-conference proceedings editing begins in conference house and continues there until Sunday afternoon
Sunday	The proceedings office is moved from conference house to EICC throughout the day; the Internet café and paper reception office are setup; delegates begin to arrive in the evening.

We also had access to storage space in Edinburgh courtesy of Edinburgh university. Throughout the pre-conference week equipment was moved from Daresbury to this storage facility, so it was quickly accessible on the Sunday.

Networking at the Conference Centre

The conference centre was connected to the Internet via a third party line (20Mbit bandwidth) which was rented for both the pre-conference and conference period. Though pre-conference editing was in a separate building to the main EICC, the network could be patched through and this allowed us to remain on the same subnet for the whole two weeks. It also meant the file/print server could be moved to the EICC early on Sunday morning and still be easily accessed by editors in conference house.

Network connections within the EICC was handled by their own staff and they provided 100Mbit RJ45 connection points within the rooms, fixed and DHCP internet addresses and also handled the routing of traffic onto the third party leased line. We provided tabletop network switches, UTP cable and additional electrical extension leads. The network within the EICC was set up on a private address range and none of our computers were visible on the Internet; all external traffic was NAT routed. Wireless access within the EICC was provided via a separate 5Mbit connection which was rented for the duration of the conference.

In the unlikely event of any prolonged network outage of the main leased line, the EICC possessed ADSL lines and separate points of presence from other network providers which could be accessed in an emergency.

Proceeding Office Computer Setup

For ease of configuration all the computers were set up identically with a single password protected editor account and arranged as a Workgroup. Individual computers were not backed up throughout the day – instead editors saved their work onto a local file server, which was accessed via a mapped network drive (Z:) or desktop shortcut. When an editor logged on for the first time they were instructed to create a personal folder on the network file share and to use this for all important work; the Firefox web browser can be configured to automatically use this directory for file downloads.

The computers were cloned with four print queues configured: two real ones for the Xerox Phaser printers, Adobe PDF (file) and Generic EPAC PS (file). Security was set on the real print queues and the editor file share such that only the editor account could access them.

The Main software installed on the PCs was:

- Windows XP Professional (SP2) with firewall enabled
- Internet Explorer 6
- Secure FTP 2.5
- Secure CRT 5.1
- Windows Defender
- Adobe Acrobat 7
- GView 4.7
- Ghostscript 8.51
- Mozilla Firefox 1.5.0.4
- Adobe Acrobat Distiller 7
- Coffee Cup Free FTP
- Enfocus PitStop pro 6.53
- jEdit 4.2
- MikTex + JacCOW style files
- Openoffice 2.0
- RealVNC 4
- WinEdt 5.4
- Sophos antivirus
- Microsoft Office 2003 (Word, Excel, Access)
- Hummingbird Exceed 10

The WinEDT licences were purchased by EPAC, Adobe Acrobat and Enfocus PitStop by JACoW and the others courtesy of CCLRC

Internet Café Setup

The available room space only allowed for 34 user stations: 29 were allocated a PC and 5 provided power and a network cable for laptop users. One Xerox phaser 8500/ADN printer was provided in the room and was accessible to both laptop and PC users. Additional chairs and “UK visitor” power adaptors were also provided.

Café PC’s were installed with a subset of the editor software and cloned with access to a single print queue on the print server. Logon was via a single unprivileged

account (epac), which had no access to either the editor file share or the proceedings office print queues.

Paper Upload File Server

Authors and editors communicate via a web browser to the EPAC server at CERN to upload and download papers. While the meta-data is hosted at CERN, the files themselves are actually stored on a separate server provided by the conference organisers which is accessed transparently via browser redirects. It is vital that this server is highly available as any offline time impacts on both authors and editors.

This separate upload server was located at Rutherford Appleton Laboratory and was a cluster of three RedHat Enterprise 4 Linux Machines running the apache web server and configured for web service failover. The uploaded conference papers were stored on a clustered GFS file partition housed on an iSCSI RAID5 storage system. Networked backup facilities were available courtesy of the Rutherford Appleton Laboratory Atlas Data Store and the whole local computer system (including network switches) was protected by an Uninterruptable Power Supply. As the system was relatively new we were able to allocate a 100Gb partition for EPAC papers. At the start of the conference this partition contained around 12GB of data and 10000 files.

The paper upload area was also served directly to the web via a password protected address - this facility was originally added for diagnostic purposes as it gave access to the paper upload log files, but it also proved useful at the conference for quickly accessing last minute talk uploads. The server itself could also be accessed by SSH/SCP if required.

Conclusions

...to be written...

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