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The Mac in a Linux and Windows Environment

***MacOSX - Some Details
System Update
Connectivity
Every Day Essentials
Font Management***

***Hardware - No Incompatibility's
Open Source - fink (very short)
ACL
Developer Tools
Windows (5 Slides)***

***Missed Items
Summary***

Q & A



MacOSX 10.3.9 (Panther) & MacOSX 10.4.x (Tiger) some Details 1



- **Innovative, stable and compatible desktop operating system based on:**
 - **Mach 3.0 kernel supports:**
 - preemptive and cooperative multitasking,**
 - symmetric multiprocessing,**
 - multithreading across processors and FreeBSD Unix services,**
 - improved SMP performance**
 - **BSD Unix environment, called Darwin supports:**
 - all standard Unix utilities and scripting languages**
 - Tiger: many more APIs to help in porting Unix and Linux applications**
(more stable developer support - first time: official **KPIs** and versioning),
 - open source libraries to support XML transformations,**
 - data persistence,**
 - common Unix services like System V message queues, ... Java 1.5**





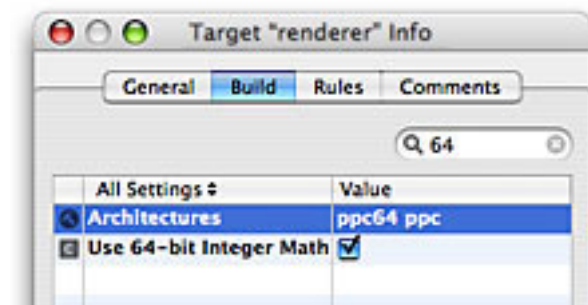
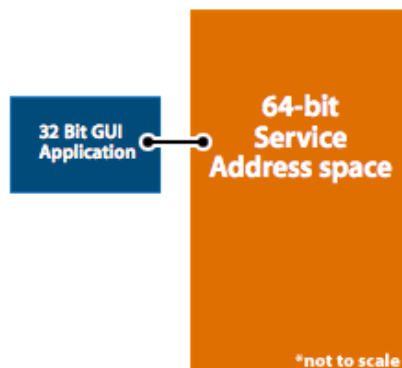
MacOSX 10.3.9 (Panther) & MacOSX 10.4.x (Tiger) some Details 2



- **Tiger: 64-bit environment**
libSystem (also a 32-bit version) - file/network i/o, math, inter-process-communication ...
*encoded 64-bit memory using the **LP64** data model*

	ILP32	LP64	ILP64	(LL)P64
ints	32-bit	32-bit	64-bit	32-bit
longs	32-bit	64-bit	64-bit	32-bit
long-long	64-bit	64-bit	64-bit	64-bit
pointers	32-bit	64-bit	64-bit	64-bit
where used	-	Tiger Unix Sun & SGI	Alpha Cray	Windows

- **32-bit applications will continue to run in native mode as long as IBM's PowerPC chips support the hybrid 32-bit/64-bit architecture**
 - *policy of fat binaries (container of both executables for G3, G4, G5)*



	PowerPC G5	PowerPC G4
Instructions in Core	200+	30+
Pipeline Stages	16	7
Load/Store	2 LSUs	1 LSUs
Floating Point	2 FPU's	1 FPU
Integer	2 FXUs	3 SFXU, 1 CFPU
Vector	VALU, VPERM	VALU, VPERM



Based on UNIX

Solid as a rock.



- **Mac OS X - most user-friendly and most highly integrated of the Unix platforms on the market**
- **But it is still not perceived as being a mainstream Unix platform for running core business applications**

I use my 1.5Ghz G4 Powerbook with 1.25 Mb SDRAM (besides presentations) for:

- **Development** for VME based CES-RIO2 (PPC cpu) board computer (H1 SiDAQ) - no system - only shell (**C-programming**) - development environment using old MacOS (OS9 in **Classic Mode** of MacOSX)
- **Linux system development** for ROOT based **Monitoring software** (summer student from Prague University) (CES-RIO3), the system was build using **Yellow Dog Linux** and **CES kernel extensions**
- **H1 Detector Control and Interaction with DAQ** (Java, X11), **HV-Steering** (PVSS, X11), **Monitoring** (ROOT, X11), **Slow Control** (Java, X11)
- **Connectivity**: Powerbook may go to sleep in one location and wakes up somewhere on an entirely different network (intelligent **launchd** ruling all processes, discover dependencies (**massaging protocol**) and operate accordingly)
- **Office Applications, Remote Control** (Examples later) ... ask me
- **Using the OSX-server in Hall North (HN): Ethernet load and start of RIO2 boards (tftp-boot), DNS server ...**
- **Using the OS9 machine in HN for direct access of VME crates** ⇒ **M.Lange (IT student) wrote a driver for PCI-VME access for MacOSX (Panther and Tiger))**



Mac: Hardware Certified $\Rightarrow$ No Incompatibilities, i.e

Hard Drive – Hitachi HTS548080M9AT00

CD/DVD – MATSHITA DVD-R UJ-835F

External Keyboard & Display regularly used (Bluetooth optional)

Bluetooth HCI (newer Pb have Bluetooth rev.2 already)

Devices (Paired, Favorites, etc):

Name: Peter

Type: Cellular Phone

Services: Service Discovery, Fax, Voice gateway, SerialPort, Dial-up networking, OBEX Synchronisation, OBEX Object Push, OBEX File Transfer, Voice gateway



AirPort Extreme Card

DESY registered – MAC address – WAP key

Built-in Ethernet

DESY registered – MAC address & DSL connect

Built-in FireWire

Internal Modem

(connecting from home), Fax, ISDN (PC-card solution)

Sound Card – Texas Instruments TAS3004

ATI Mobility Radeon 9700:

Chipset Model: ATY,RV360M11

Bus: AGP

VRAM (Total): 128 MB

Vendor: ATI (0x1002)

Displays:

Display:

Type: Display

Display Type: LCD

Resolution: 1680 x 1050

Depth: 32-bit Color

Core Image: Supported

Main Display: Yes

Mirror: Off

Online: Yes

Quartz Extreme: Supported

Display:

Status: No display connected

System Power Settings:

AC Power:

System Sleep Timer (Minutes): 0
Disk Sleep Timer (Minutes): 10
Display Sleep Timer (Minutes): 5
Dynamic Power Step: Yes
Reduce Processor Speed: No
Automatic Restart On Power Loss: No
Wake On AC Change: No
Wake On Clamshell Open: Yes
Wake On LAN: Yes
Wake On Modem Ring: Yes
Display Sleep Uses Dim: Yes

Battery Power:

System Sleep Timer (Minutes): 10
Disk Sleep Timer (Minutes): 10
Display Sleep Timer (Minutes): 2
Dynamic Power Step: Yes
Reduce Processor Speed: No
Automatic Restart On Power Loss: No
Wake On AC Change: No
Wake On Clamshell Open: Yes
Wake On Modem Ring: No
Display Sleep Uses Dim: Yes
Reduce Brightness: 1

Battery Information:

Battery Installed: Yes
First low level warning: No
Full Charge Capacity (mAh): 4328
Remaining Capacity (mAh): 4325
Amperage (mA): 0
Voltage (mV): 12529
Cycle Count: 32

AC Charger Information:

AC Charger (Watts): 65
Connected: Yes
Charging: No

Hardware Configuration:

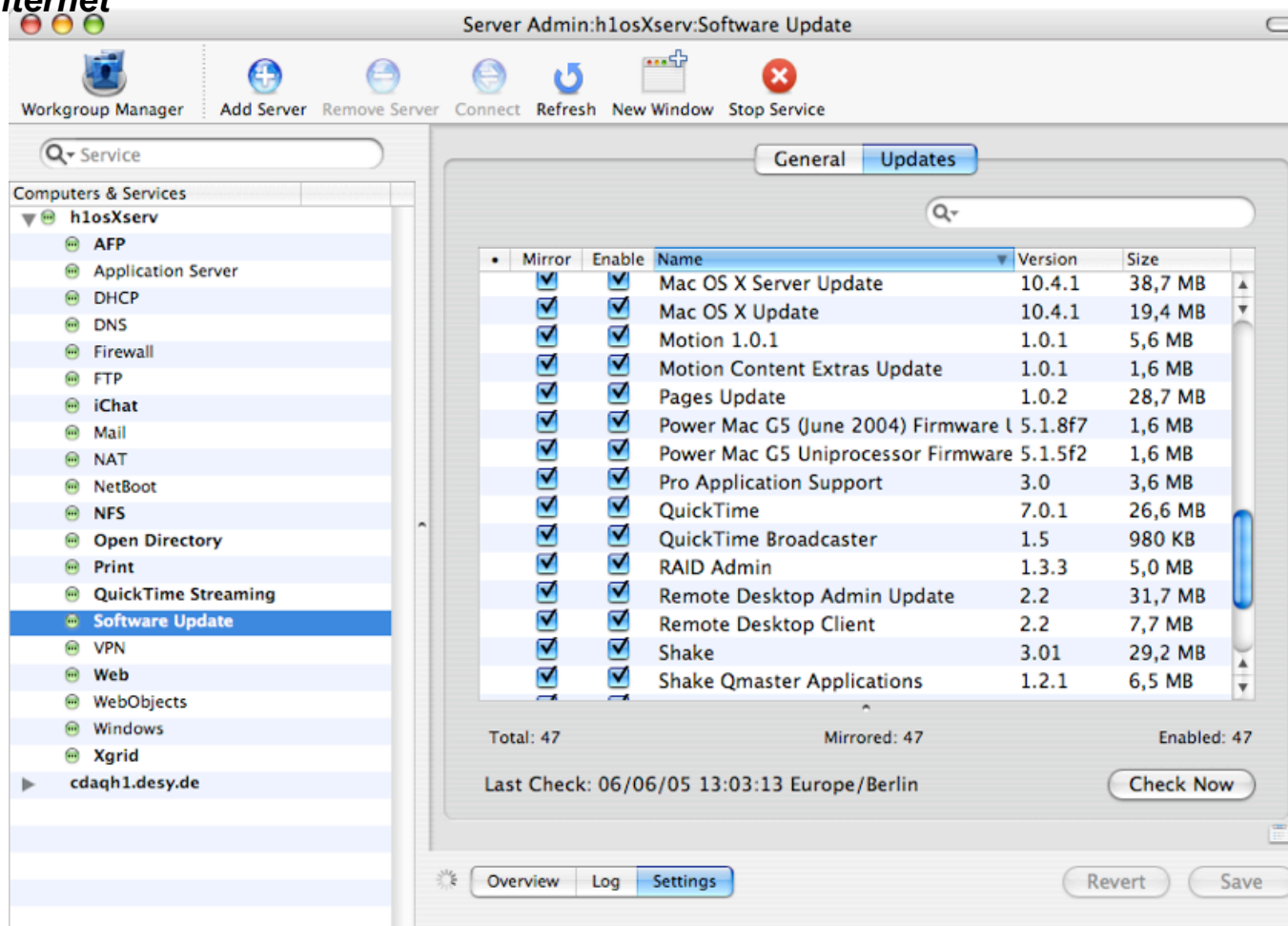
Clamshell Closed: No
UPS Installed: No



MacOSX System Update



- **The MacOSX client system - installed one by one (DVD/CD), or booted/installed pre-configured from the server - different pre-configurations possible**
- **The system is updated automatically - client and server**
Software Update Server - cache local copies of updates to Mac OS X, update machines locally rather than through the Internet





System & Open Source



- **Partitioning of my hard drive - Powerbook G4:**

Apple_Bootstrap	yaboot	ext3		linux	
Apple_UNIX_SVR2	swap	ext3		linux	
Apple_UNIX_SVR2	root	ext3		linux	
Apple_UNIX_SVR2	trans	ext3		linux	(ext3 mountable on OSX Desktop (rw))
Apple_HFS	os9	extended hfs - journaled		OSX	
Apple_HFS	fink	extended hfs - journaled		OSX	
Apple_HFS	HD_PK	extended hfs - journaled		OSX	

- **[fink](#) - open-source software - kept separate from the system maintained on the OSX servers in HN (running Panther) and in Zeuthen (Tiger)**

The servers get info, source, patch files from fink servers (rsync) and compile the code locally (proxy: ccache is used), i.e.:

[lesspipe](#), [auctex](#), [fftw](#), [firefox](#), [root4-cernlib](#), [python](#), [root-pythia](#), [cernlib-geant321](#), [cernlib-mclibs](#), [cernlib-paw++](#), [mc](#), [kde-ssl](#), [gnome](#), [fvwm2](#), [blackbox](#), [icewm](#), [doxygen](#), [ntop](#), [net-snmp-ssl](#), [pine-ssl](#), [mysql](#), ...

- **Complete X Window System implementation for running X11-based applications. Fully integrated with the OS, based on the open source XFree86 project - gives UNIX users the ability to run thousands of X11 applications**

http access - updating the clients using debian tools (stable, unstable, local trees),

- > sudo apt-get update
- > sudo apt-get upgrade



Network-/External-Devices & Connectivity



- **External Devices**

automount -nsi

on /Network (automounted)

automount -fstab

on /automount/Servers (automounted)

automount -static

on /automount/static (automounted)

USB1/2

|

firewire-400/800

|

mounted

on /Volumes (seen on Desktop)

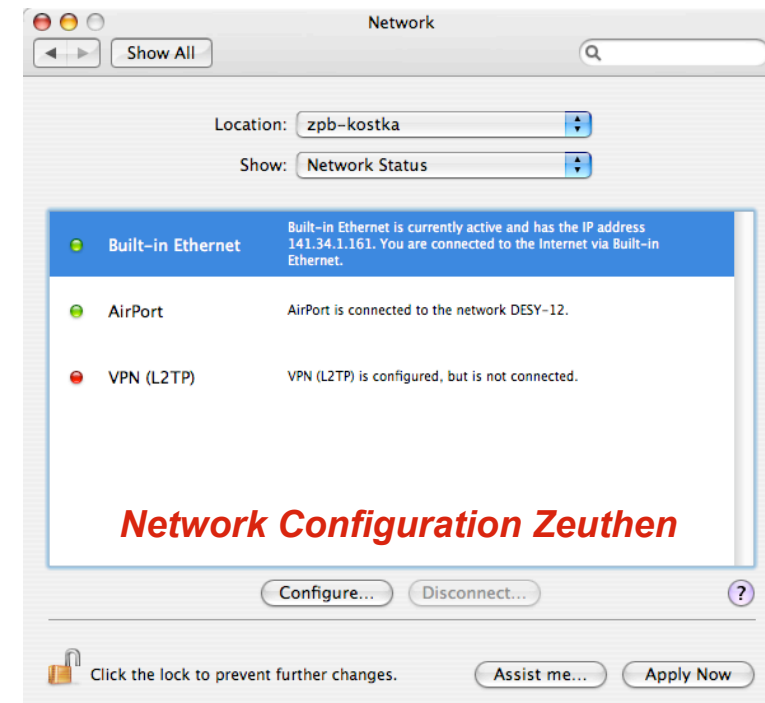
i.e.: 2nd Mac started in target mode and firewire connected - seen as firewire disk

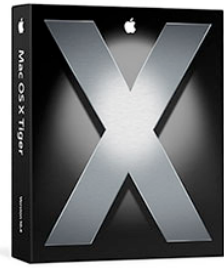
- **Network related:**



**only for Panther at the moment
(full featured port - expected soon)**

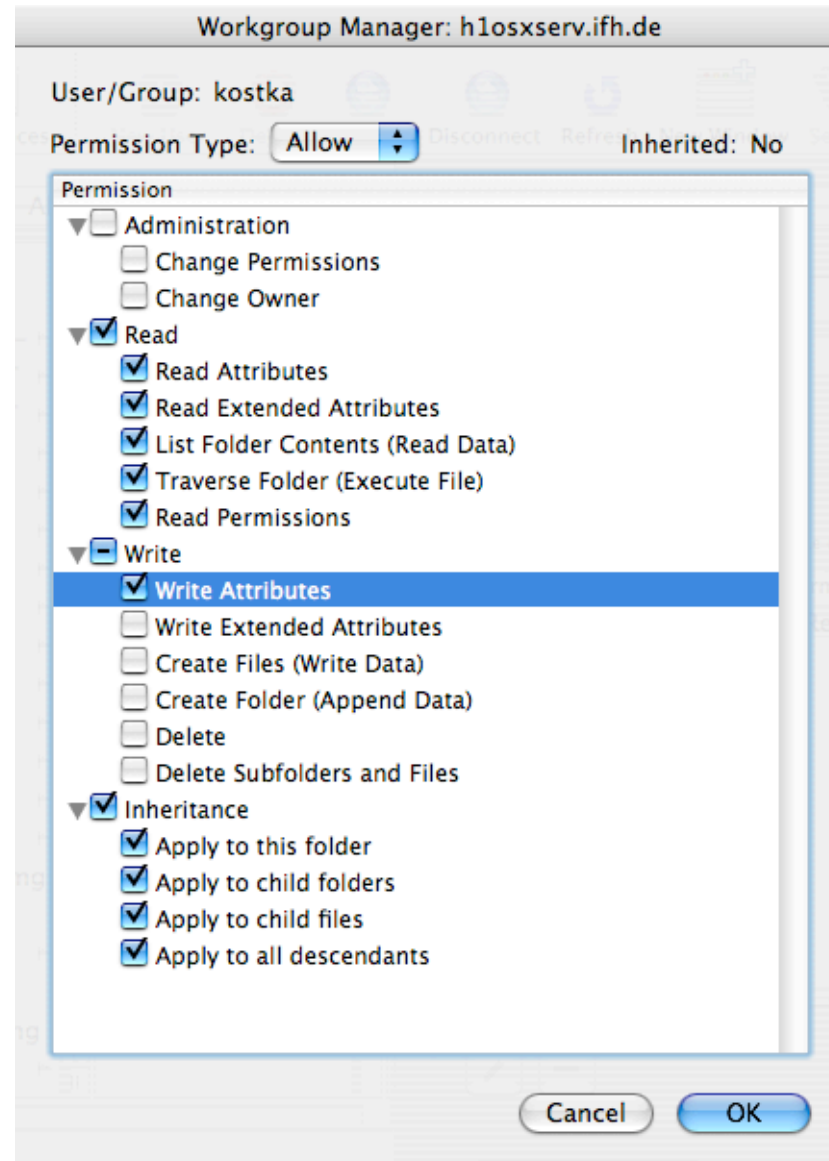
Unified file locks across AFP, SMB/CIFS and NFS protocols





ACL Handling

*fully compatible with Windows Server 2003
Active Directory environments & Windows XP clients*



Workgroup Manager ACL panel (Tiger Server only)



Every Day Essentials



- **OpenAFS (Panther), ssh2/ssh1,**
- **krb5/4 nicely supported/incorporated by/in MacOSX**
- **Nice interfacing to Zeuthen standards (Linux here)**

Mail



```
kostka@IFH.DE - 23 hours, 56 minutes
kostka@IFH.DE
Active User New Renew Destroy Password Info

Ticket Cache
Time Remaining
(v4/v5) kostka@IFH.DE 23:55

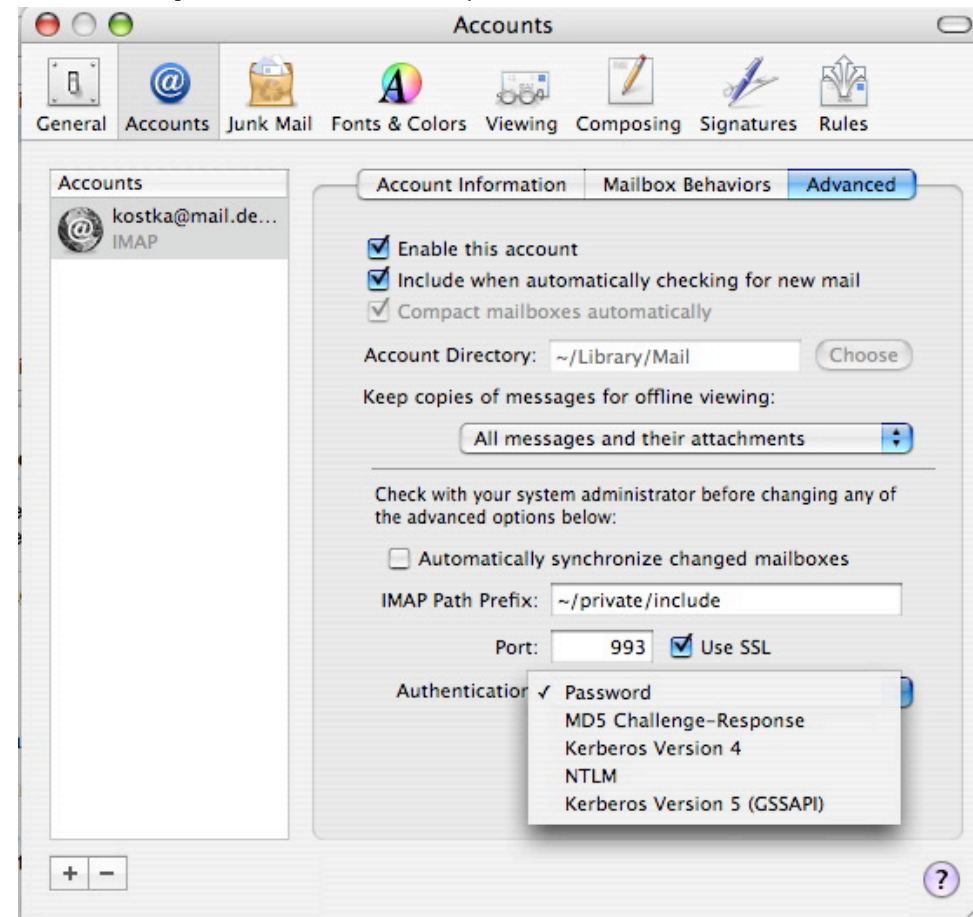
Tickets
Time Remaining
(v5) kostka@IFH.DE
krbtgt/IFH.DE@IFH.DE 23:55
(v4) kostka@IFH.DE
krbtgt.IFH.DE@IFH.DE 23:55

Kerberos 5 ticket cache: 'API:Initial default ccache'
Default principal: kostka@IFH.DE

Valid Starting Expires Service Principal
06/06/05 08:44:29 06/07/05 09:44:29 krbtgt/IFH.DE@IFH.DE
renew until 06/13/05 08:44:29

Kerberos 4 ticket cache: 'Initial default ccache'
Default Principal: kostka@IFH.DE
Issued Expires Service Principal
06/06/05 08:18:08 06/07/05 09:44:29 krbtgt.IFH.DE@IFH.DE

=zpb-kostka:~ 9:51>
```



- **cyrus-sasl, ssl, perl, tcl, teTeX (LaTeX),**
- **Tons of useful utilities - making the life easier**

... ask
... ask again

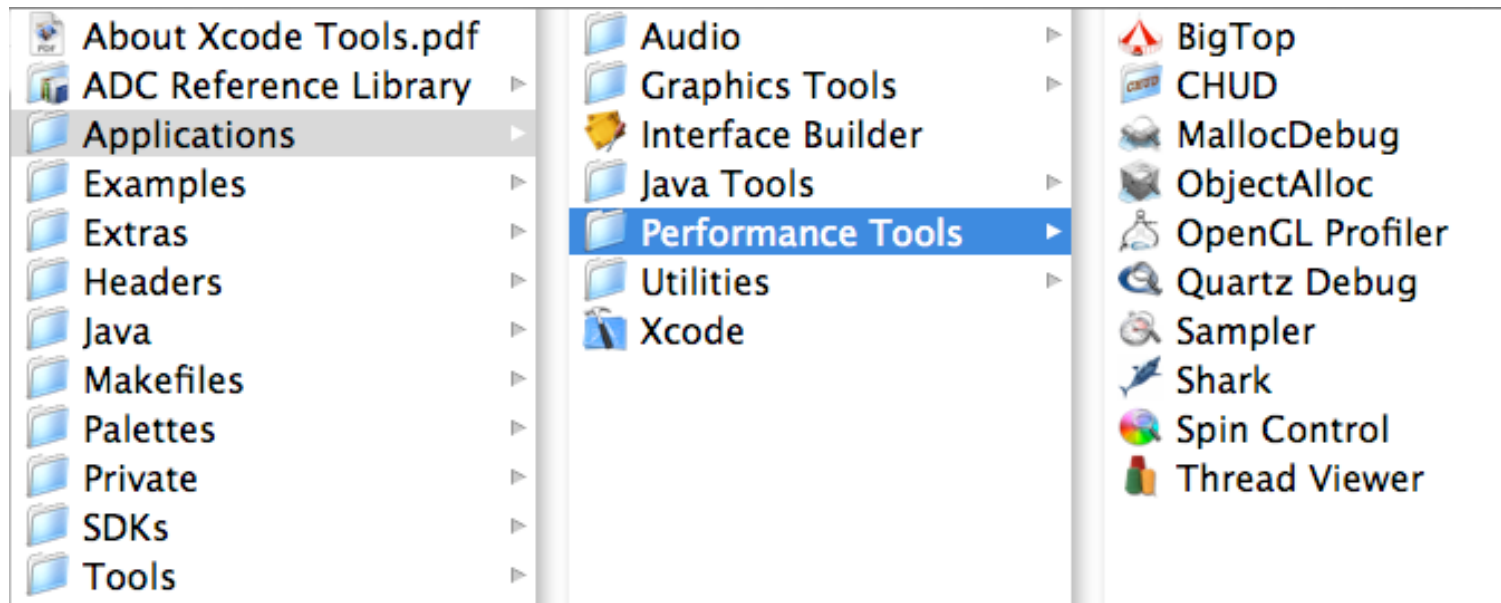


Developer Tools



- **Default Compiler Tiger (as of OSX version 10.4.2 pre-release):**
gcc-4.0.0, g77-3.4.3, g++-4.0.0, java-2
optimised: already about ~3 times faster than with Panther
OSX (BSD) additionally $\Leftrightarrow$ Linux development
Dynamic libstdc++

- **Xcode Tools**





Font Management



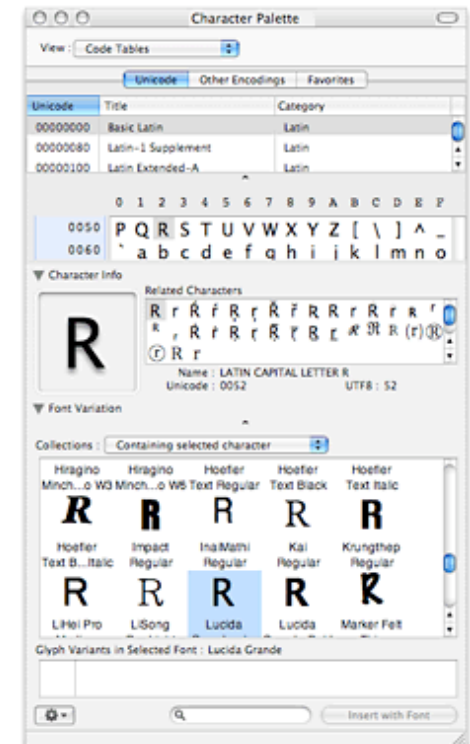
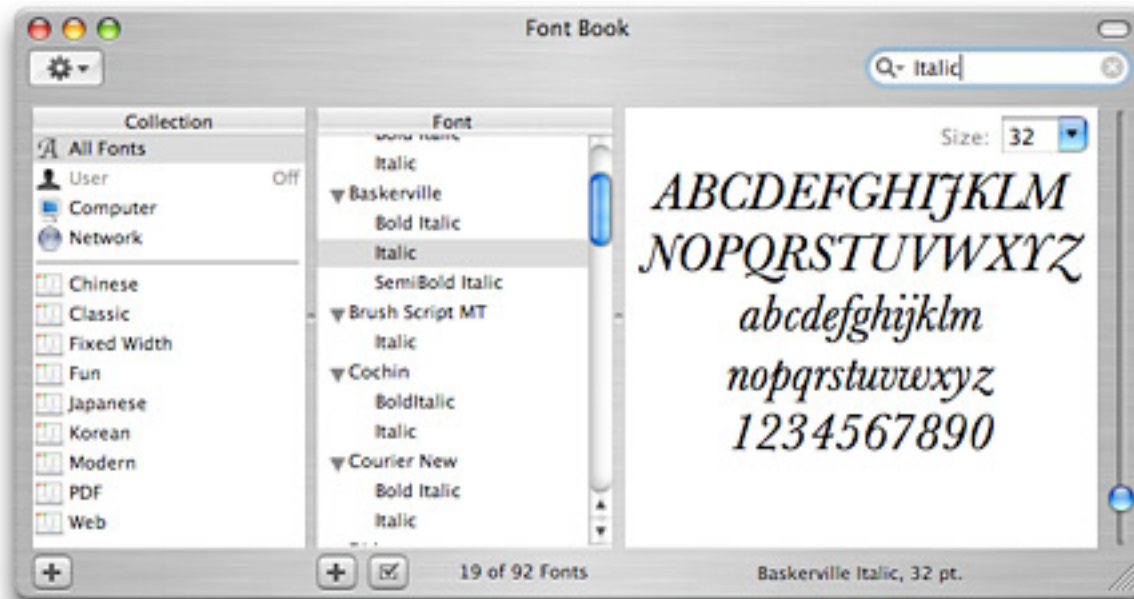
- **FontBook.app**

- **Font handling local**

UTF-8, Localisation's, Unicode - No Problem

- **Fonts added:**

Mathematica fonts (taken from linux)





Windows

Join the network.

1



Share Files: SMB/CIFS protocol (Samba 3)

*connect to a Windows-based server or Windows PC
(file sharing enabled)*

Finder - just click the Network icon and browse to the server

*Macs and Windows PCs can open, edit, save and copy the
same files using a shared folder or directory on the Mac or PC.*

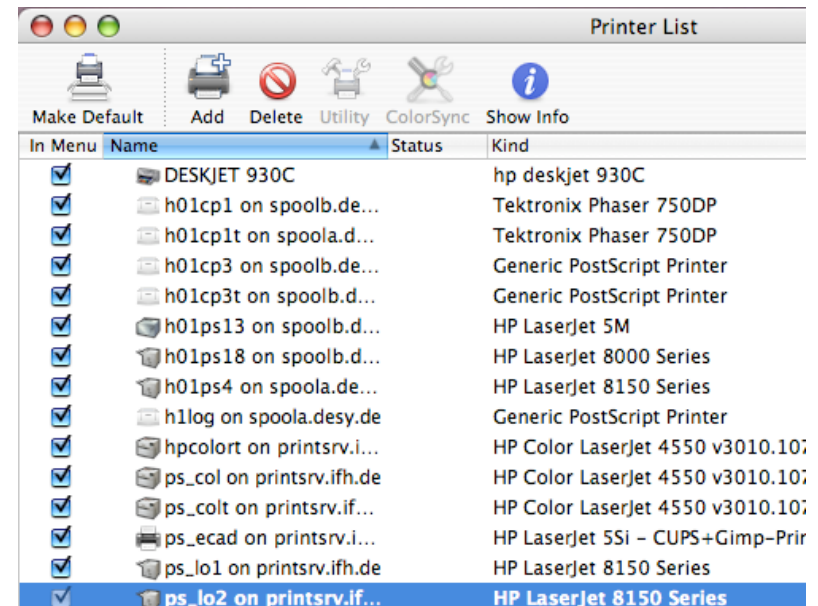
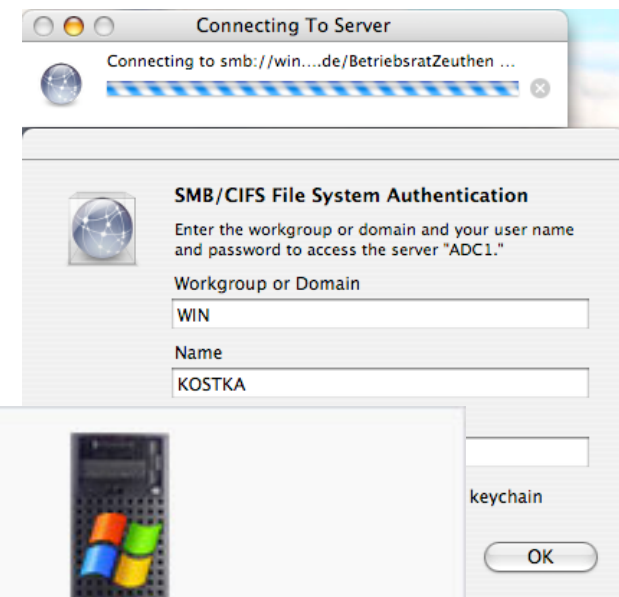
ACL and native file permissions of the Windows XP desktop

Share Printers

*Shared Windows printers automatically appear in the Mac
OS X Printer Setup Utility ⇒ local printer queue.*

*Any application that can print on the Macintosh can print to
the shared printer.*

Personally I don't use Windows printers





Windows 2

Join the network.



Share Discs

Cross-platform ISO 9660 standard

Burn and share files on a recordable DVD disc (4.7GB or double layer)

Windows PC with a DVD-ROM drive can read the DVD-/+R disc



Share Mail

Microsoft Exchange mail server

Mail supports IMAP

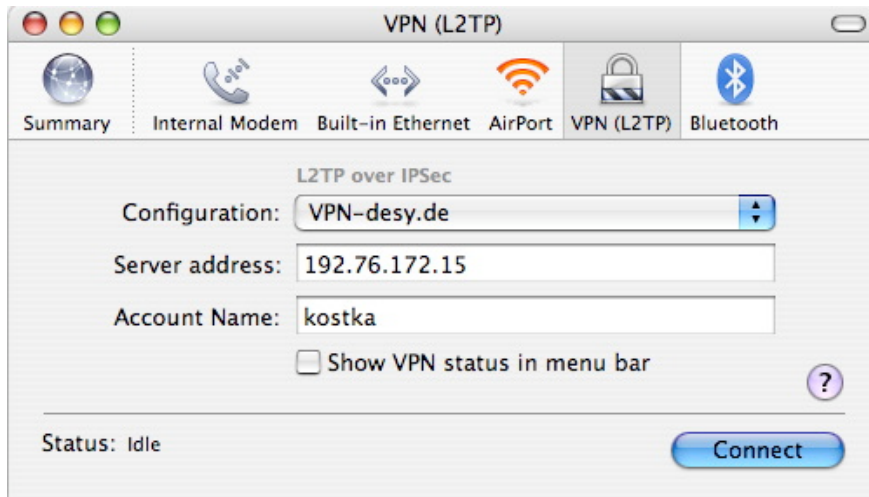
Mac OS X Tiger - standard GNU Zip compression and expansion for file attachments

General Information	
Account Type:	IMAP
Account Description:	IMAP Account
Full Name:	Apple Computer
Email Address:	apple@apple.com



Windows 3

Join the network.



VPN - system build in / client - cisco

Work from home and use a DSL or cable modem to connect to the corporate network

Mac OS X is VPN-ready - supports VPN on demand - supports the Layer 2 (L2TP/IPsec) and (PPTP)

Compatible with most popular VPN servers, including those from Cisco and Microsoft - Cisco client available

Active Directory support

- ***Mac's can be added to an existing Active Directory network without additional software or any changes to the Active Directory server schema (if set up to spec.)***

Built-in support for Microsoft Kerberos (MSK) authentication and Active Directory authentication policies

- ***as password changes,***
- ***expiration and forced password changes,***
- ***as well as Active Directory replication and failover.***





Authentication



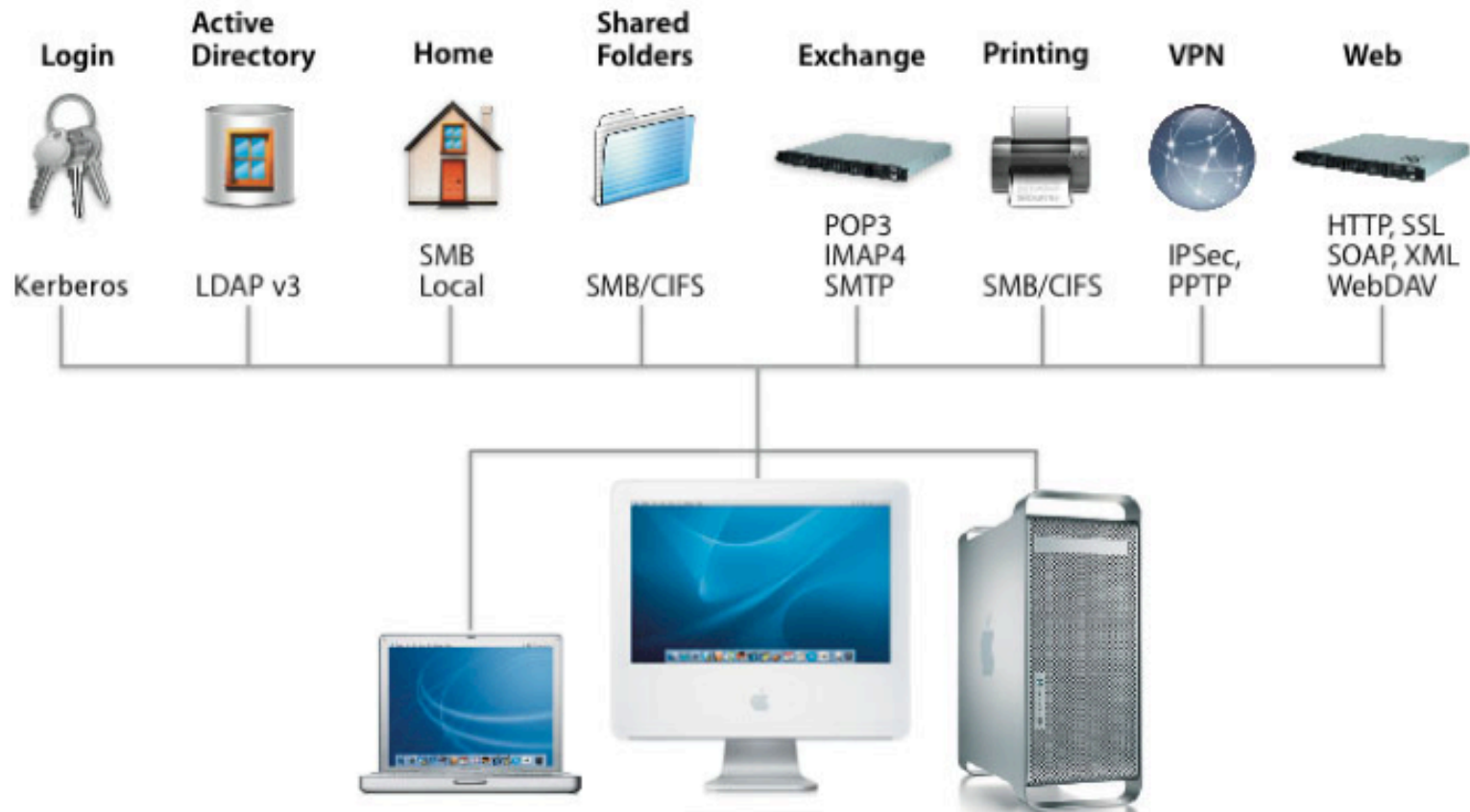
Network Home Directories



Move to Mac?



Mac and Windows Interoperability





Desktop Applications (Selection)



My Choice

Application	Windows	Macintosh
Microsoft Office	Microsoft Office	Microsoft Office 2004
Sending E-Mail	• Outlook Express • Outlook • Eudora • Mozilla Thunderbird	• Apple Mail • Microsoft Entourage 2004 • Mailsmith • Mozilla Thunderbird • Powermail • Eudora
Web Browsers	• Internet Explorer • Mozilla/Firefox • Opera	• Safari • Internet Explorer (Discontinued) • Firefox • Camino • Opera
Instant Messaging	• AIM • ICQ • Yahoo Meseenger • MSN Meseenger • Trillian	• iChat • AIM • Yahoo Messenger • MSN Messenger • Fire • Proteus • Adium
Burning CDs	• Nero • Easy CD Creator • CloneCD	• Roxio Toast • Finder • iTunes





Missed Items



Finder



Core Audio



Core Image



Core Video

Spotlight



Dashboard



Automator



Universal Access



iChat AV



PDF



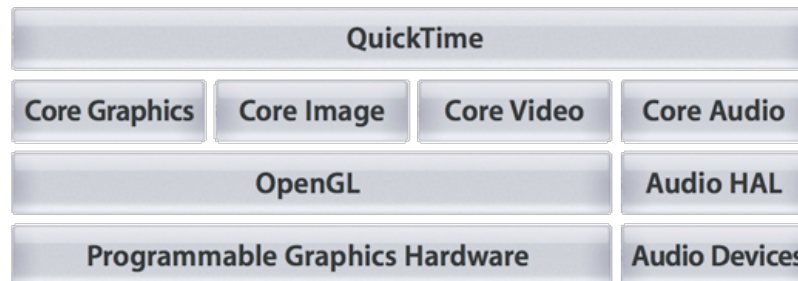
Printing



Faxing Built In



Calendar/
Organiser



Video - H.264

QuartzExtreme - OpenGL

IT Enterprise Area

...



Summary

- ***Mac is not in the strategic line of computing at DESY***
- ***Mac's are productivity tools with innovative potential***
- ***They are nicely adopted to every day enterprises in a Linux and Windows environment with all required compatibility for office, scientific computing and connectivity needs***



Hot News as of 6.6.05

19:43

Gerade kommt eine Pressemitteilung von Apple - ein Auszug: "We plan to create future versions of Microsoft Office for the Mac that support both PowerPC and Intel processors," said Roz Ho, general manager of Microsoft's Macintosh Business Unit. "We have a strong relationship with Apple and will work closely with them to continue our long tradition of making great applications for a great platform."

19:53

News: In einer zeitgleich versendeten Pressemitteilung hat Apple den Wechsel von PowerPC auf Intel-CPUs auch offiziell bestätigt. Ab 2006 werden die ersten Geräte mit x86-Chips erscheinen, bis 2007 sollen alle Modelle nur noch mit den neuen CPUs ausgeliefert werden. Mac OS X läuft bereits heute auf Macs mit Intel-CPU, bestehende Software soll dank eines heute vorgestellten "Developer Transition Kits" (999 US-Dollar, ab sofort erhältlich) mit wenig Aufwand portiert werden können. Intel wird eigene Tools und Libraries für Mac-Entwickler bereitstellen.

Apple will Macs mit PowerPC-Prozessor langfristig unterstützen und beide Systeme gleichwertig behandeln. Details dazu sind aber noch nicht bekannt. Unterdessen haben bereits Adobe (zukünftige Versionen der Creative Suite) und die Mac Business Unit von Microsoft zugesagt, die neue Plattform zu unterstützen.

Network Configuration Zeuthen

To be Used Now

Q & A