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Mission Critical Linux

Venue:	IESL Auditorium
Date:	10-Mar-2004
Presenter:	Wickramanayake HMKSK
	KWickramanayake@virtusa.com

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Agenda

- History of GNU Project and Linux
- Software Licensing Taxonoy
- Linux Distributions
- System Overview
- Conceptual Architecture of Linux Kernel
- Recent Linux Desktops
- Future of Linux in the Enterprise...

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Agenda – Linux in the Enterprise

- Phases of Linux Adoption
- Linux Acceptance
- Linux and Types of Applications
- Future of OS Market
- Hardware Vendor Support for Linux
- Open Source and Linux : Where and Where not
- Linux as a Client in the Enterprise

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History...

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The GNU Project

- Started by Richard M Stallman (RMS) in 1984
- The goal of GNU was a “free” Unix like OS
- GNU software was based on the GPL
- RMS himself wrote GCC, Emacs, GDB

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The GNU Project

Richard M Stallman (RMS)

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The GNU Project

- **GNU evolves…**
  - GNU system was “almost” complete by 1991
  - Herd, the GNU kernel was incomplete

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Linux, the missing piece of GNU system

- In 1991, Linus Torvalds start writing a “free Unix like operating system” called “Linux”
- Many developers around the world join Linus
- In 1994, Linux 1.0 is released
- In 1996, LANL uses a 68 node Linux cluster to simulate atomic shock waves

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Linus Torvalds

Linus Torvalds

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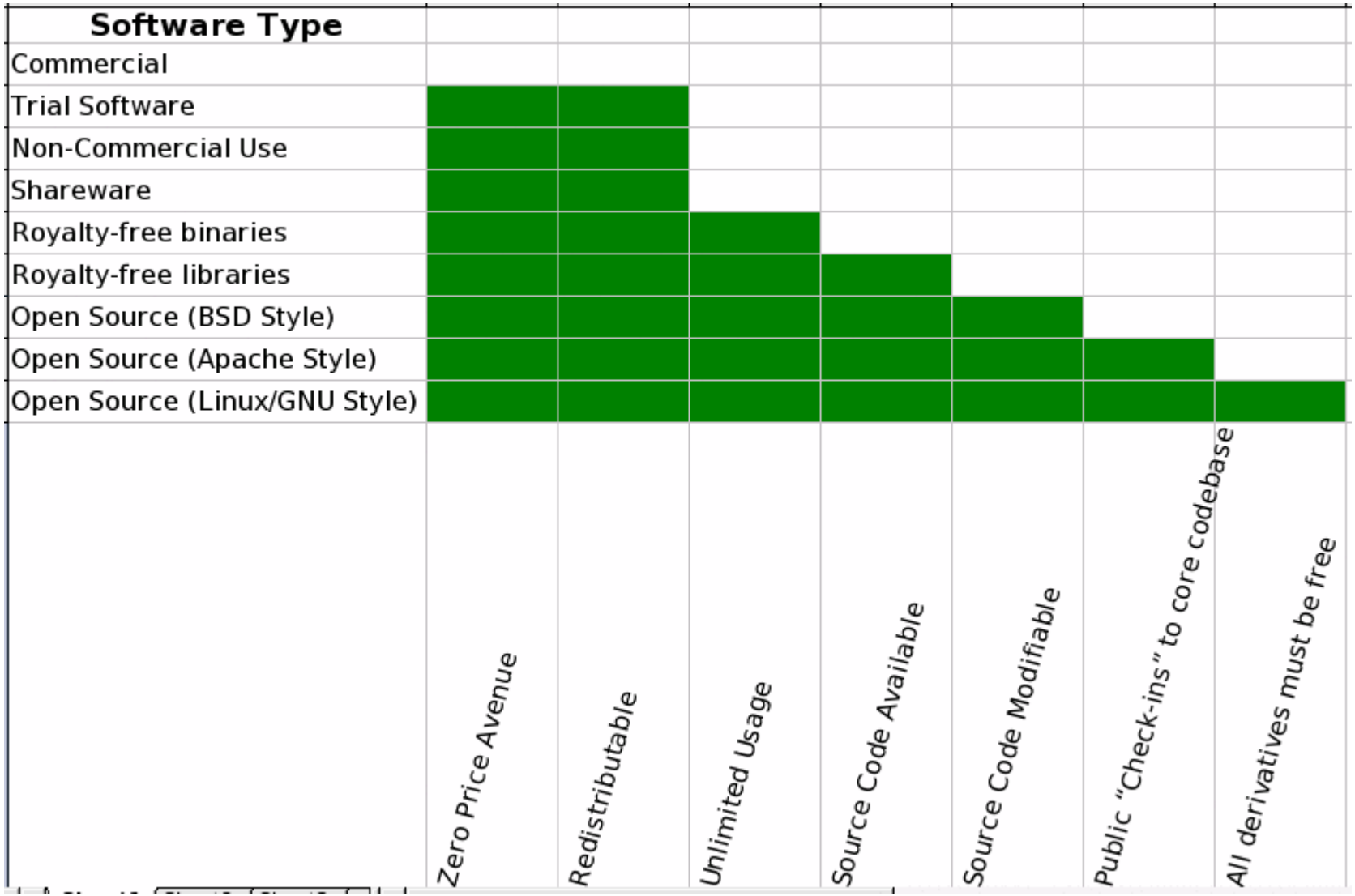
Software Licensing Taxonomy



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Linux distributions

- Linux Distributions are made by putting together Linux kernel and other software into a single package
- RedHat, Debian, Mandrake, Caldera, SuSE are popular Linux Distributions

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Linux distributions

RedHat

- Supported by many commercial vendors
- Good package management system – RPM

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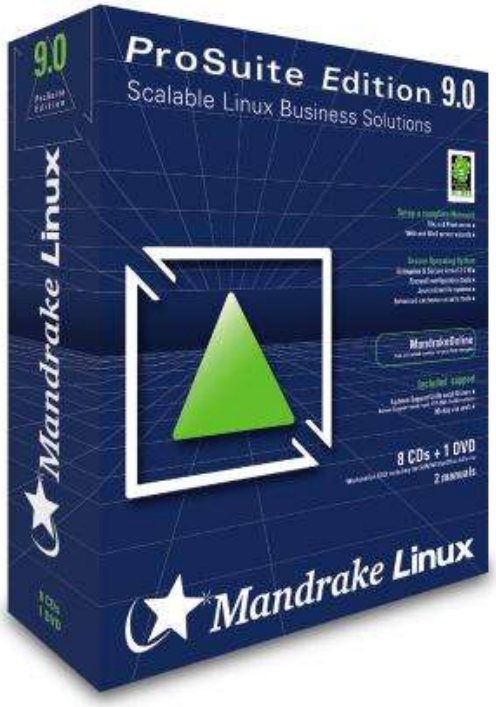
Linux distributions



Mandrake

- Gaining popularity as more “user friendly”
- Impressive graphical user interface

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Linux distributions

SuSE

- Popular in Europe, especially Germany
- A huge set of software is bundled with SuSE

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Linux distributions

Slackware

- Known as the *do-everything-yourself* distribution
- Popular among some Linux *gurus*

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Linux distributions

Debian

- Excellent package management system - APT
- Extremely stable
- Easy system upgrade
- Thousands of packages

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System Architecture

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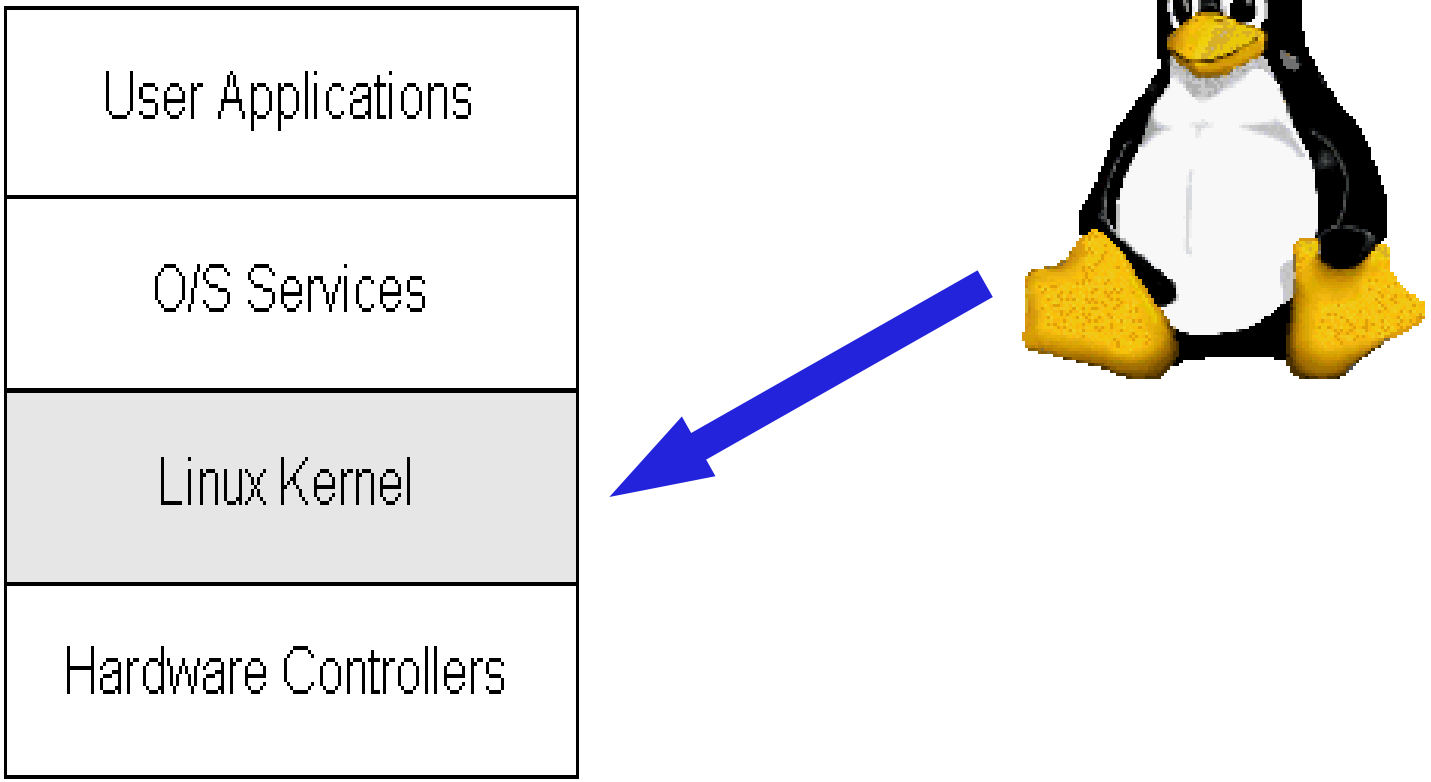
System Overview



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Components of a Linux Distribution

- Linux kernel
  - This is the heart!
- Shells and GUIs
  - For command input...
  - Textual - bash, csh
  - Graphical - KDE, GNOME
- System Utilities
  - System utilities (ls, cp, grep,...)
  - Daemons (telnetd, sshd, sendmail, httpd,...)
- Application Programs
  - gcc, openoffice, mozilla,...

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Purpose of the Kernel

- The Linux kernel presents a virtual machine interface to user processes
- Processes are written without needing any knowledge of what physical hardware is installed on a computer

  The Linux kernel abstracts all hardware into a consistent virtual interface
- Linux supports multi-tasking in a manner that is transparent to user processes

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Conceptual Architecture of Linux Kernel

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Architectural Features

- Kernel is composed of five main subsystems
- Linux kernel architecture was designed to support a large number of volunteer developers
- Subsystems that are most likely to need enhancements were architected to easily support extensibility

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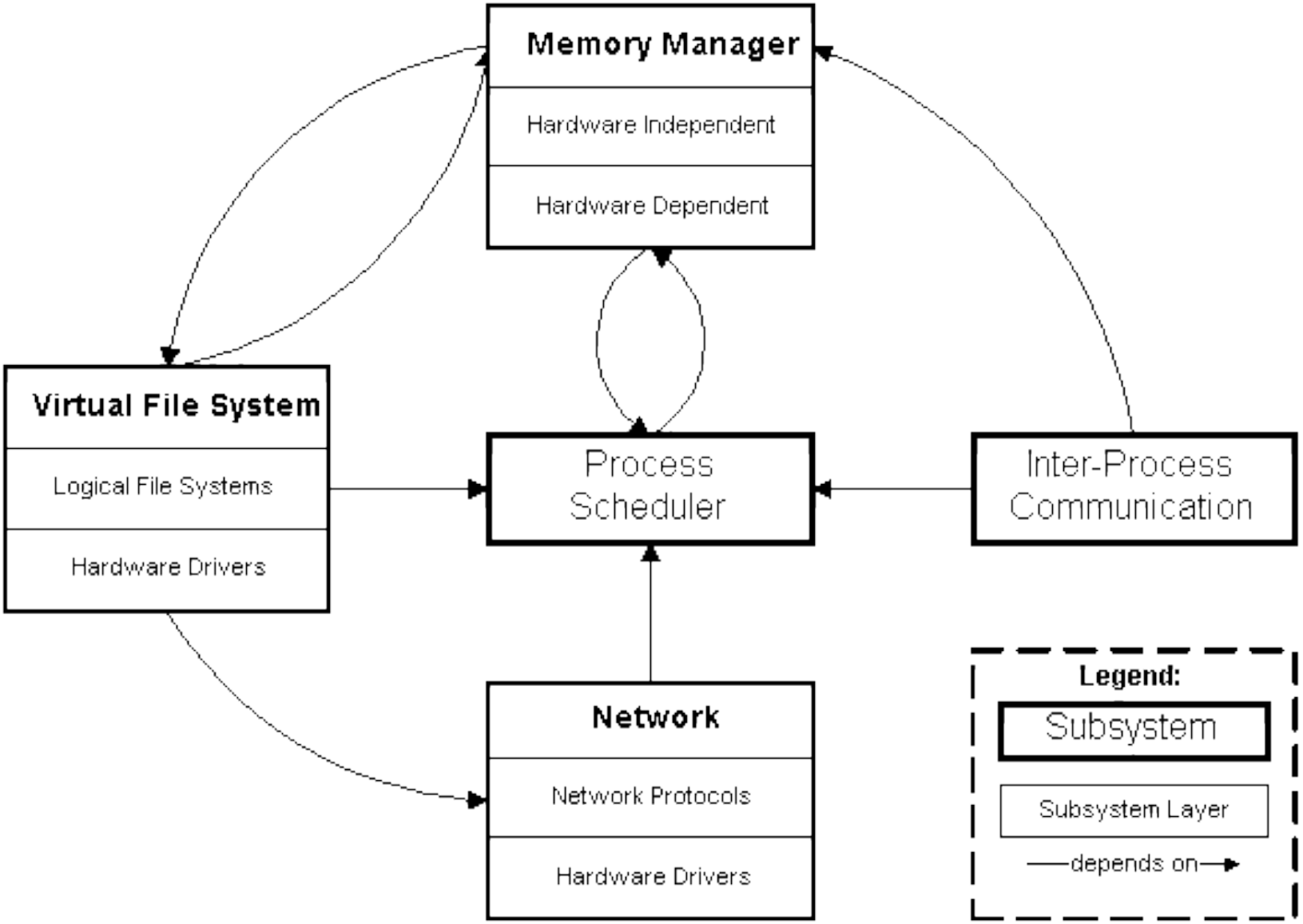
Kernel Subsystems



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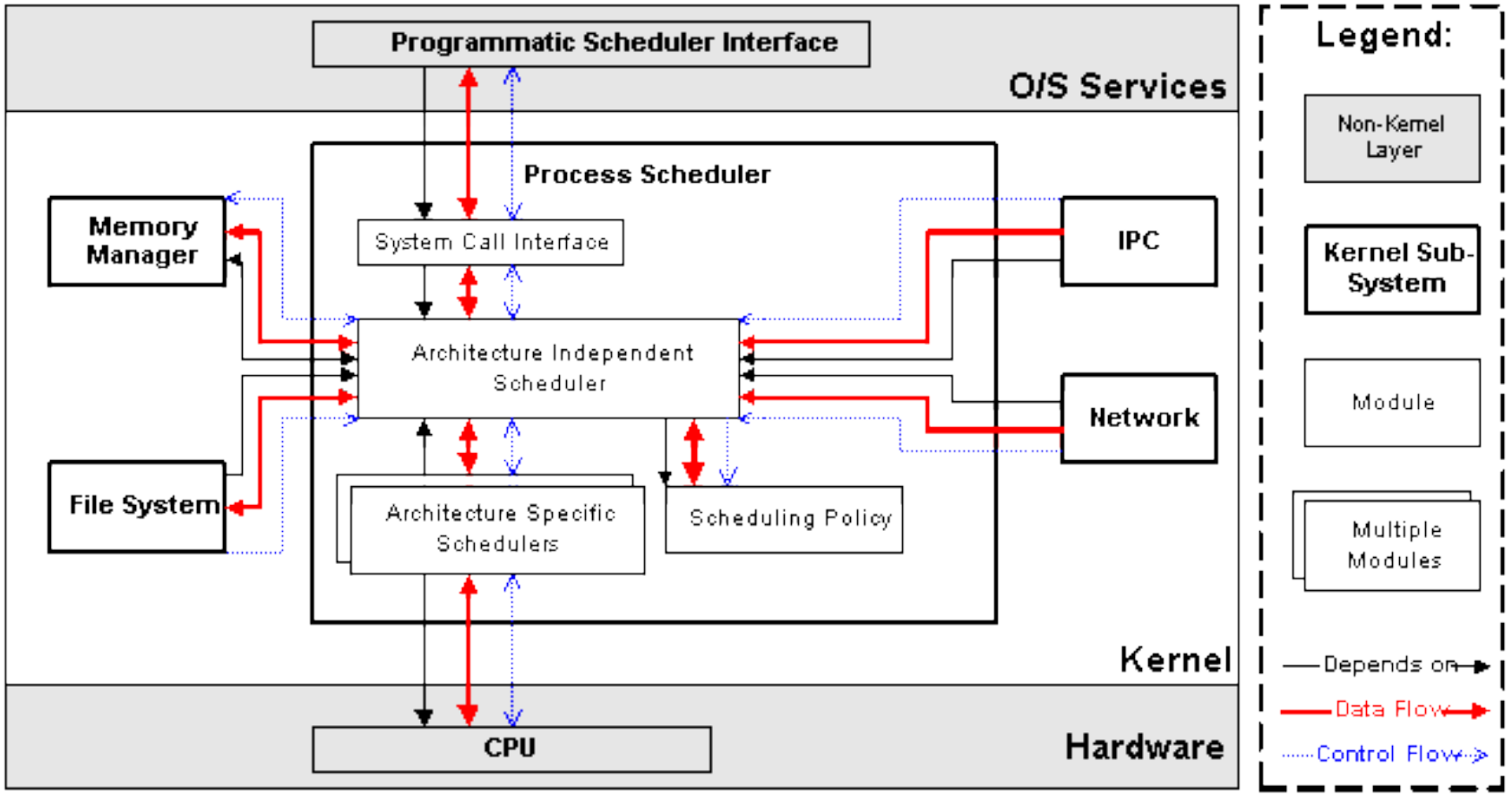
Process Scheduler Architecture



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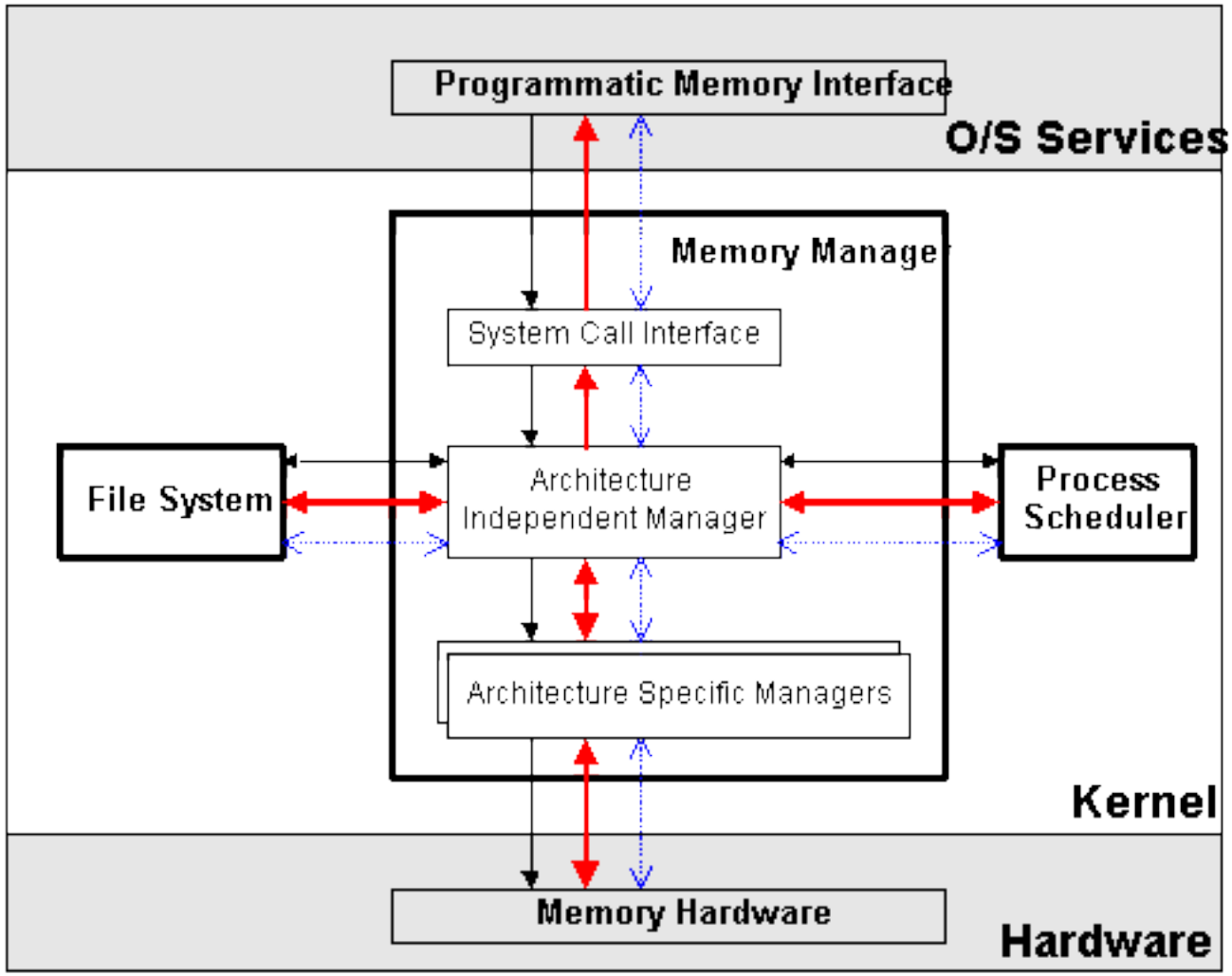
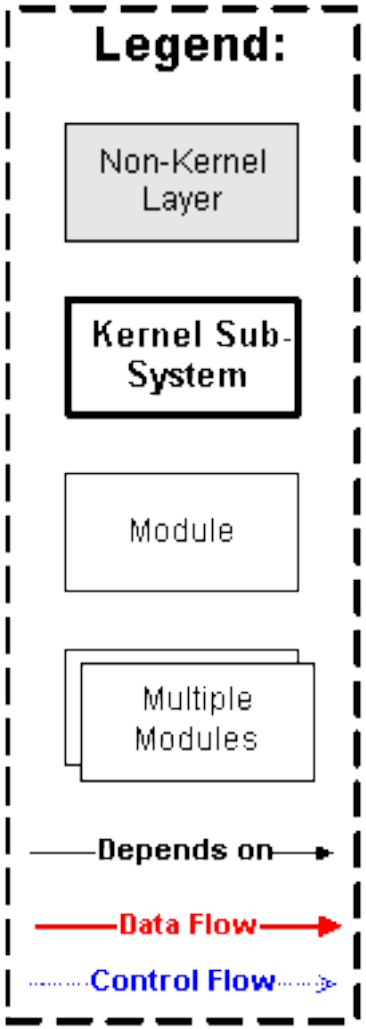
Memory Manager Architecture





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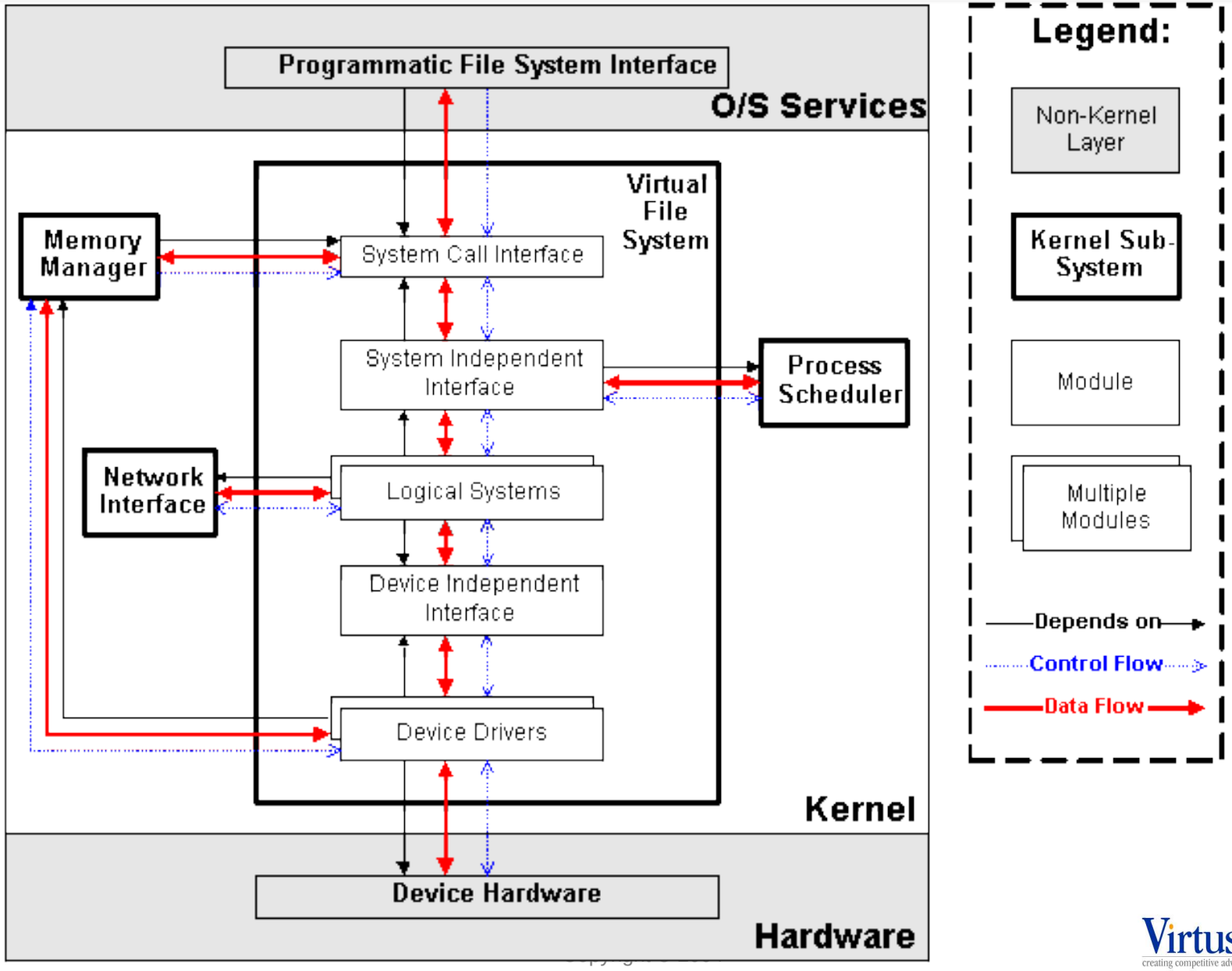
VFS Architecture



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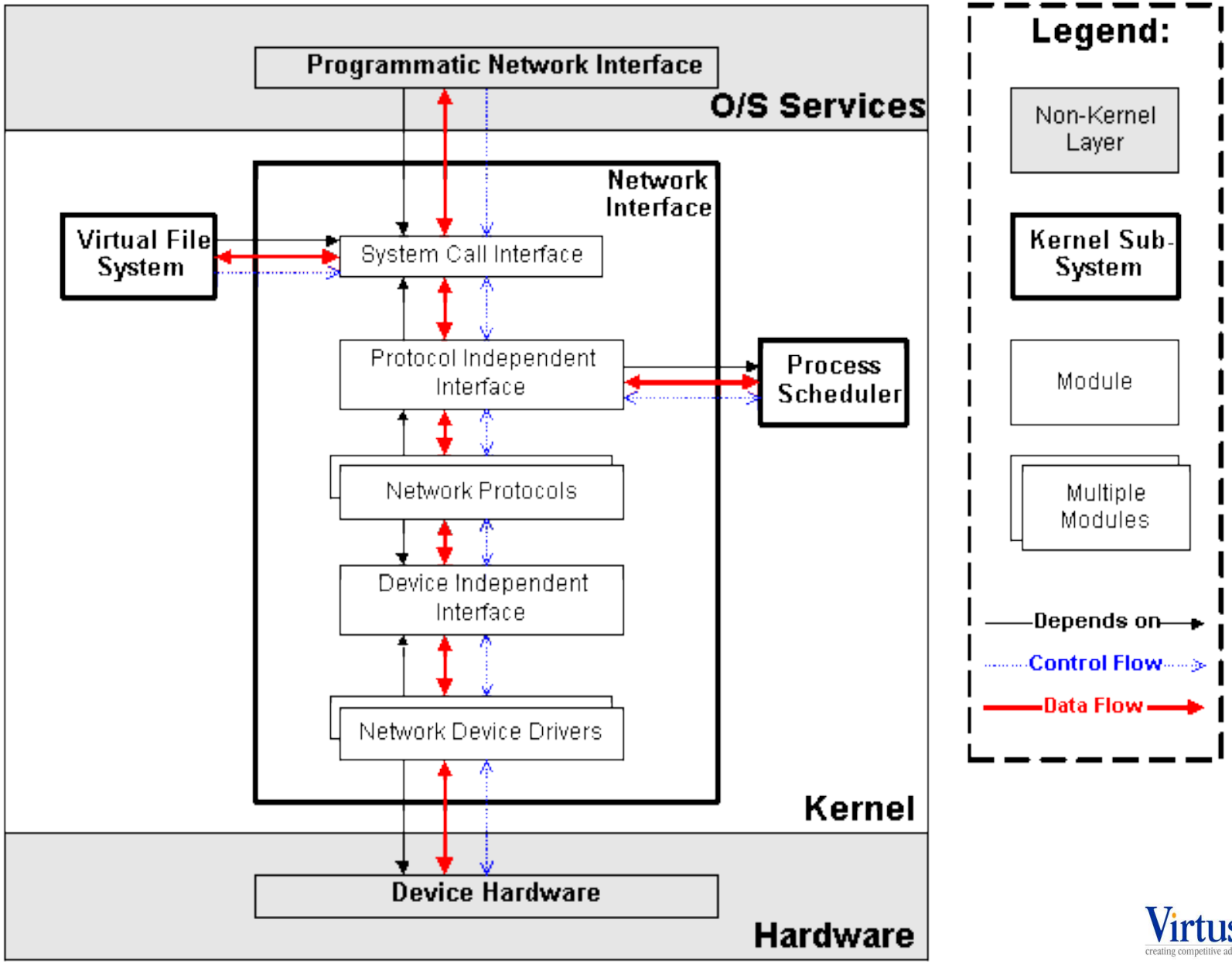
Network Interface Architecture



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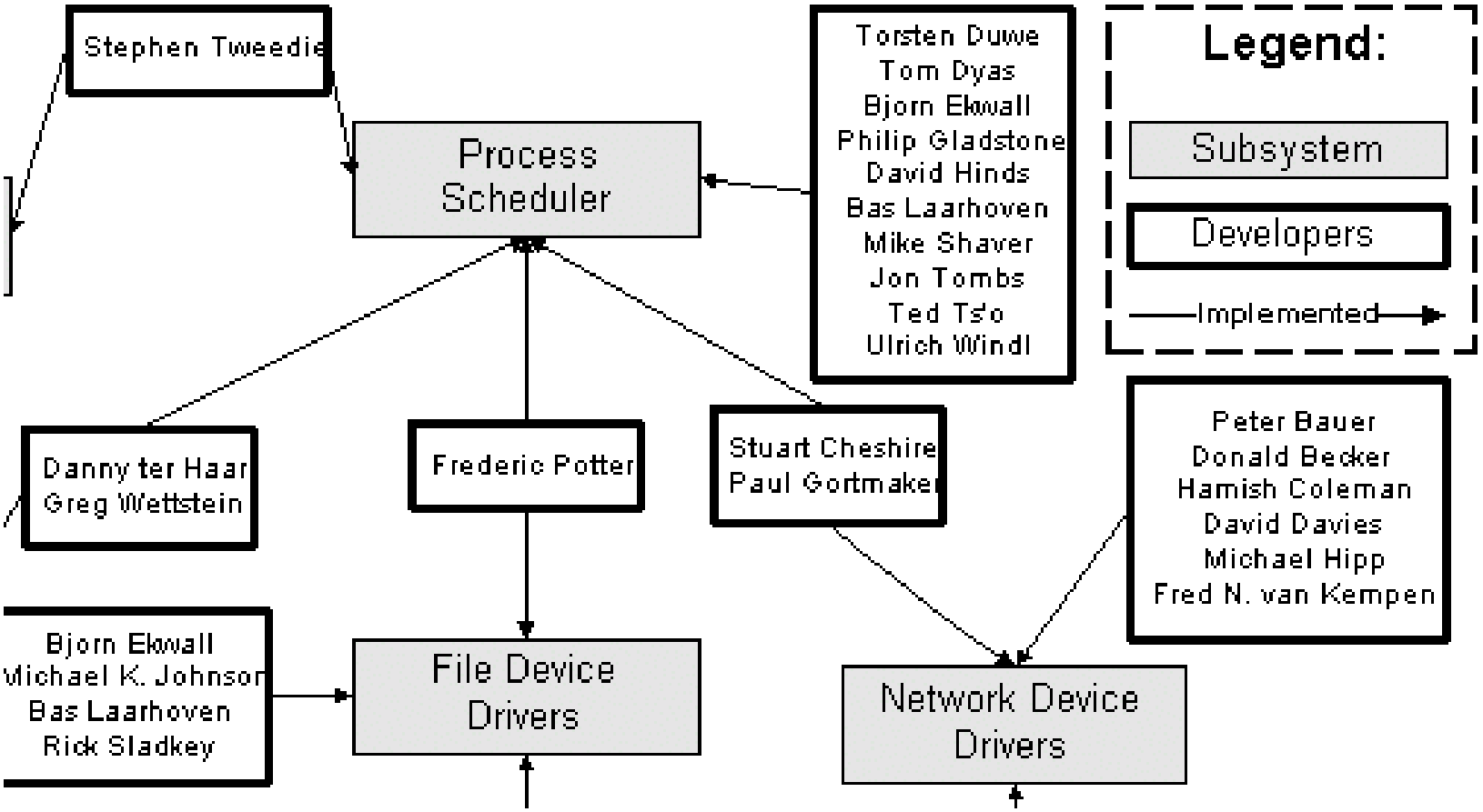
Supporting Multiple Developers



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Some of the Supported Platforms...

- Compaq Alpha AXP
- Sun SPARC and UltraSPARC
- IBM S/390, MIPS
- Motorola 68000
- PowerPC, PowerPC64
- ARM, Hitachi SuperH
- HP PA-RISC, Intel IA-64,
- DEC VAX, AMD x86-64, CRIS

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To say...

Big or small, Tux serves them all!

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Support for your office...

Some screen shots of recent Linux desktop...

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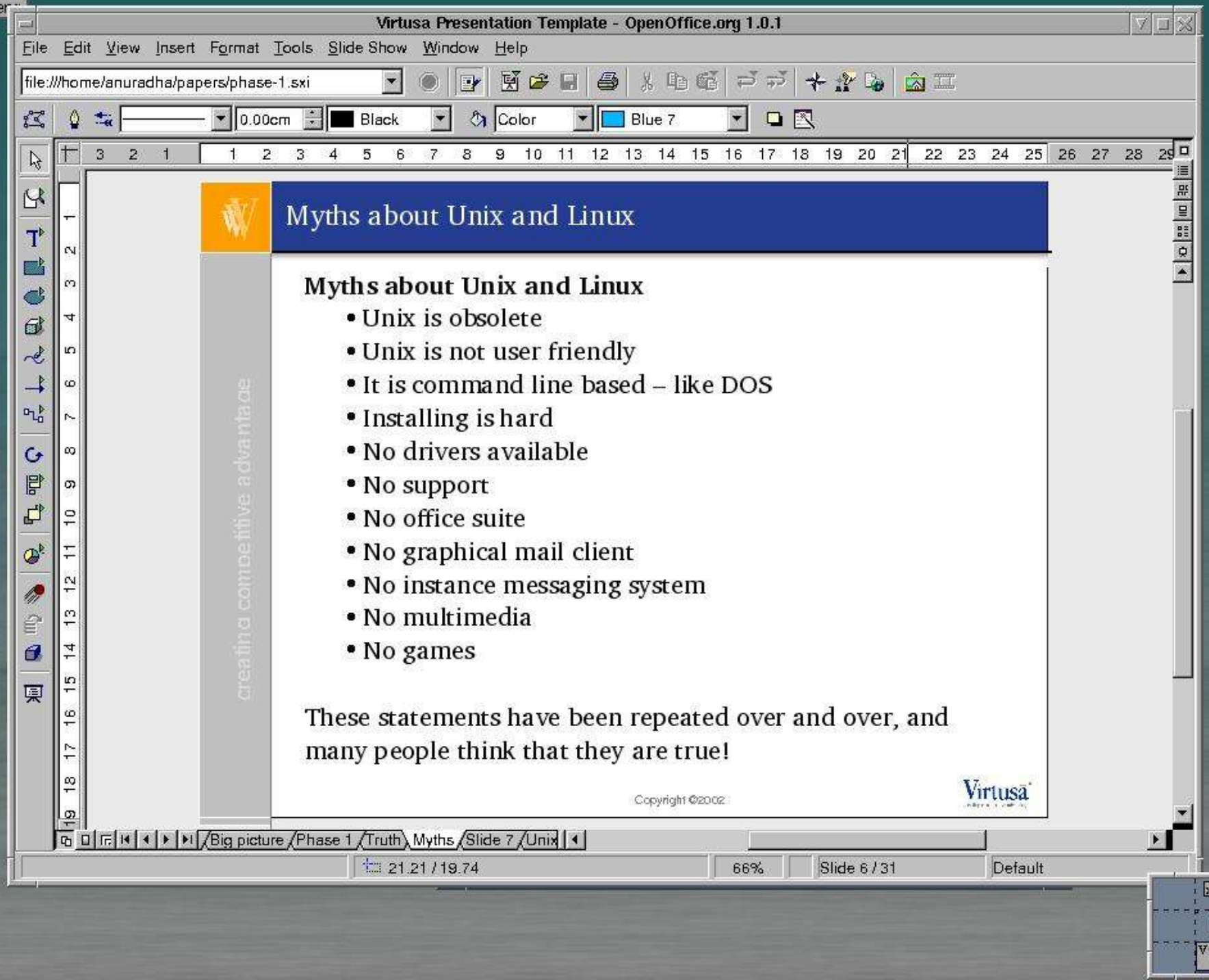
Virtusa Presentation Template - OpenOffice.org 1.0.1
File Edit View Insert Format Tools Slide Show Window Help
file:///home/anuradha/papers/phase-1.sxi
Myths about Unix and Linux
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Myths about Unix and Linux
• Unix is obsolete
• Unix is not user friendly
• It is command line based – like DOS
• Installing is hard
• No drivers available
• No support
• No office suite
• No graphical mail client
• No instance messaging system
• No multimedia
• No games
These statements have been repeated over and over, and many people think that they are true!
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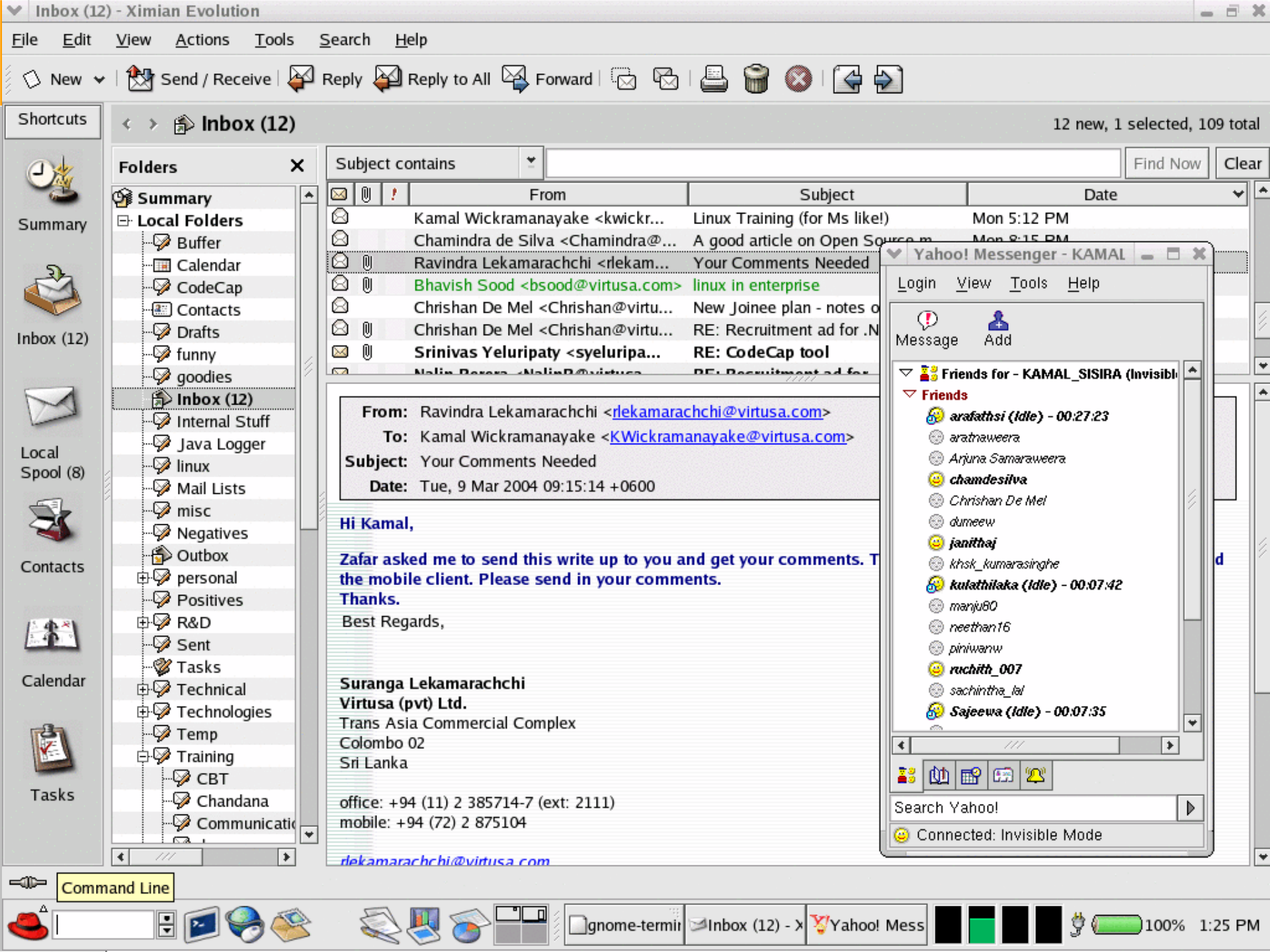
Big picture
Phase 1
Truth
Myths
Slide 7
Unix
21.21 / 19.74
66%
Slide 6 / 31
Default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New Send / Receive Reply Reply to All Forward
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Tasks
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12 new, 1 selected, 109 total
Folders
Summary
Local Folders
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Calendar
CodeCap
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Kamal Wickramanayake <kwickr...
Linux Training (for Ms like!)
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Chamindra de Silva <Chamindra@...
Ravindra Lekamarachchi <rlekam...
Your Comments Needed
Bhavish Sood <bsood@virtusa.com>
linux in enterprise
Chrishan De Mel <Chrishan@virtu...
New Joinee plan - notes o
Chrishan De Mel <Chrishan@virtu...
RE: Recruitment ad for .N
Srinivas Yeluripaty <syeluripa...
RE: CodeCap tool
From: Ravindra Lekamarachchi <rlekamarachchi@virtusa.com>
To: Kamal Wickramanayake <KWickramanayake@virtusa.com>
Subject: Your Comments Needed
Date: Tue, 9 Mar 2004 09:15:14 +0600
Hi Kamal,
Zafar asked me to send this write up to you and get your comments. T
the mobile client. Please send in your comments.
Thanks.
Best Regards,
Suranga Lekamarachchi
Virtusa (pvt) Ltd.
Trans Asia Commercial Complex
Colombo 02
Sri Lanka
office: +94 (11) 2 385714-7 (ext: 2111)
mobile: +94 (72) 2 875104
rlekamarachchi@virtusa.com
Yahoo! Messenger - KAMAL
Login View Tools Help
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Trash
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30 bytes
Bug Report Tool
Mozilla
Developers Guide to XRENDER
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Eazel Services
The GIMP
Evolution
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gnome
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GNOME terminal
Components - Evolution 0.10.99
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Send / Receive Compose Reply Reply to All Forward
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Folders
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Calendar
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Subject
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Re: bonobo-conf questions
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Today 9:20 AM
Today 8:58 AM
Today 8:52 AM
Today 2:37 AM
Yesterday 4:27 PM
Yesterday 2:12 PM
Yesterday 1:31 PM
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cave
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CIM.abw
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cvs
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main.c
main.c~
main.o
Makefile
Makefile.am
Makefile.in
test-ttf
test-ttf.c
test-ttf.o
widgets
[bratsche@grue src]$
check_module="libxml-2.0"
[bratsche@grue harlan]$ ls
ABOUT-NLS config.guess INSTALL missing widgets
acconfig.h config.h install-sh mkinstalldirs xml-i18n-extract
aclocal.m4 config.h.in intl po xml-i18n-merge
AUTHORS config.log libtool README xml-i18n-merge.in
autogen.sh config.status ltmain.sh src xml-i18n-update
BUGS config.sub macros stamp-h xml-i18n-update.in
ChangeLog configure Makefile stamp-h.in
components configure.in Makefile.am TODO
config.cache COPYING Makefile.in
[bratsche@grue harlan]$

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Linux In the Enterprise

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The Present

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Classic Phases of Linux Adoption

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Thoughts...

- Since Linux and open source cover such far-reaching possibilities and multiple market segments — from embedded to high-end, very-large server platforms — enterprise IT management will require time to digest its potential to deliver significant returns and what price to pay to move from current legacies to Linux
- Since most platforms will continue to deliver on road maps for scalability, availability and manageability in all the market segments to which Linux is an aspiring OS environment, the slope on which Linux will rise in enterprise acceptance is governed by return on investment (ROI) analysis

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Linux and Type of Applications

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Which OS in Future?

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Thoughts...

- Microsoft is vulnerable. Many of the users were complaining about NT reliability, utilization and overhead in administration, plus the license costs for hundreds to thousands of servers
- Although Linux will still account for only 18 percent of 2007 server shipment revenue, it continues to be the year-to-year fastest growth OS

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HW Vendors...

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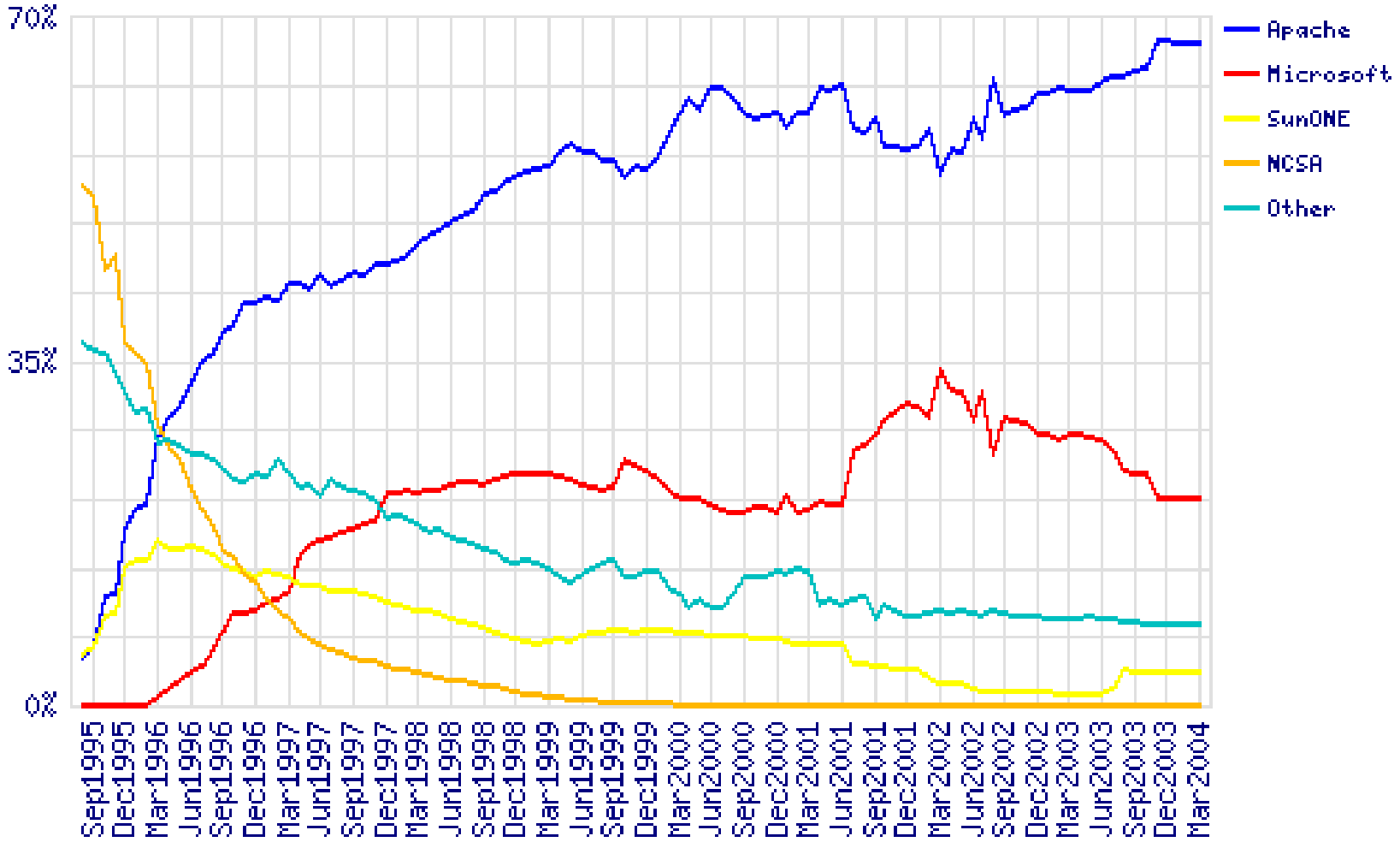
Best of the Best – Apache Web Server



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OSS and Linux: Where it is used and not used

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Conclusions

- Greater platform and OS independence
- Benefits from utilizing commodity and open source
- Broader vendor support
- Increased rate of Unix and proprietary replacements
- Increased attention by independent software vendors
- Competitive challenge to Windows pervasiveness
- Open where it makes sense, proprietary by value

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More Information...

- The Linux Documentation Project
  - How to do this and that with Linux
  http://www.tldp.org

- Visit my homepage for more links please...
  http://www.ee.pdn.ac.lk/home/kamal

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  - Got some of his slides...
- Bhavish Sood (Virtusa R&D)
  - The Gartner reserch paper is from him...

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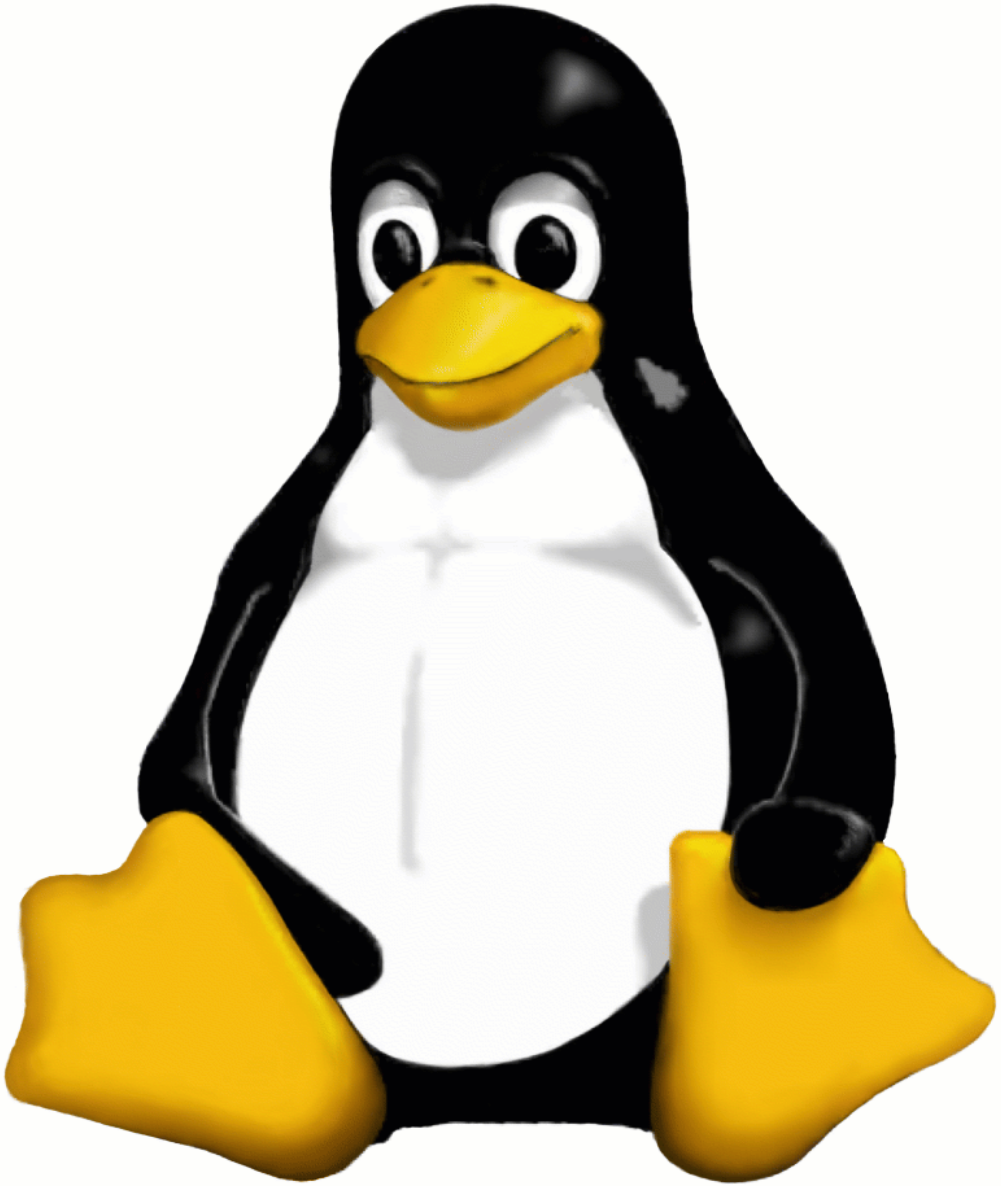
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