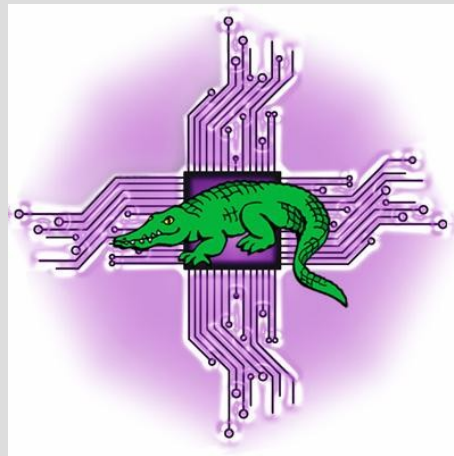
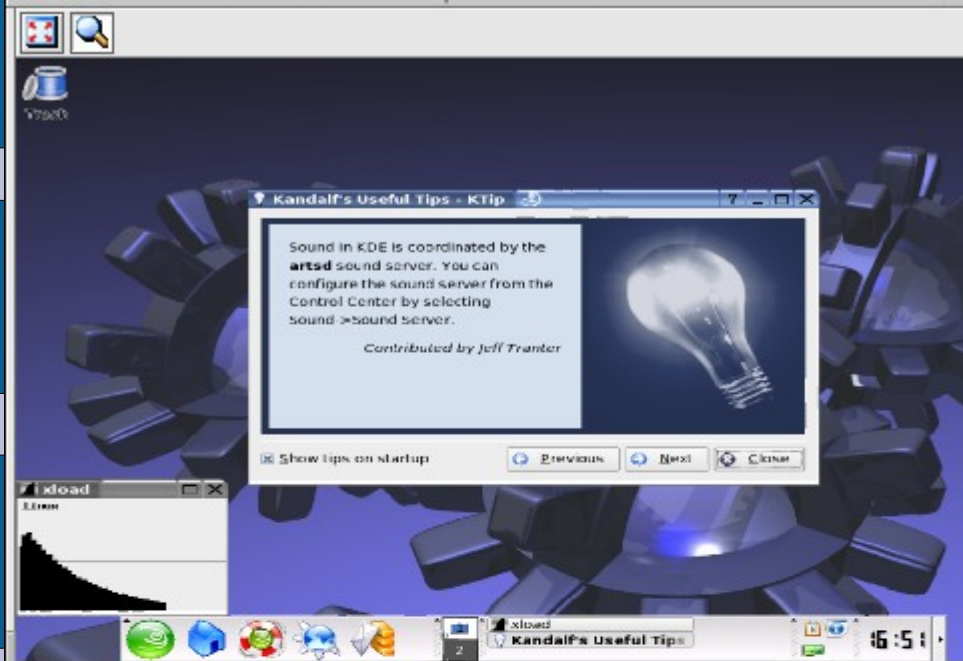


Xen: A Gentle Introduction

**Presentation to Linux Users Victoria,
Tuesday July 3, 2007**



10.212.20.148:0 - Remote Desktop Connection



root@oss-0:~

```
Starting sshd.
sysctl: top level name 'hw' in 'hw.disknames' is invalid
Starting inetd.
Tue Nov  2 16:36:01 UTC 2004

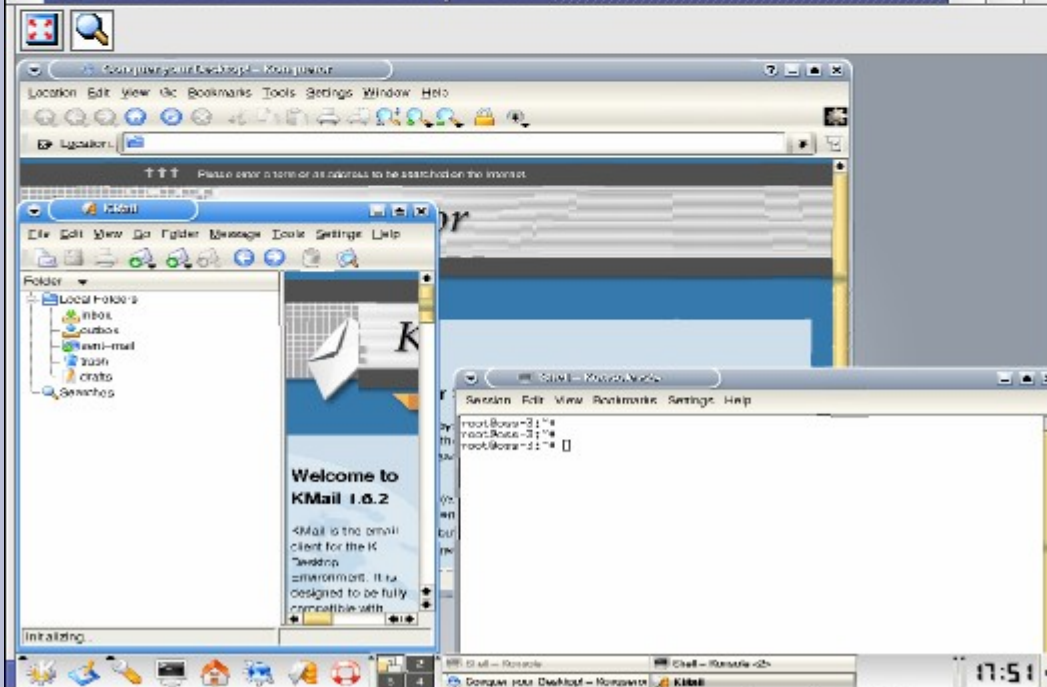
NetBSD/i386 (demo-nb) (console)

login: root
Password:
Login incorrect
login:
login: root
Password:
Last login: Tue Oct 19 09:49:21 2004 on console
Nov  2 16:48:37 demo-nb login: ROOT LOGIN (root) ON console
Copyright (c) 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004
The NetBSD Foundation, Inc.  All rights reserved.
Copyright (c) 1982, 1986, 1989, 1991, 1993
The Regents of the University of California.  All rights reserved.

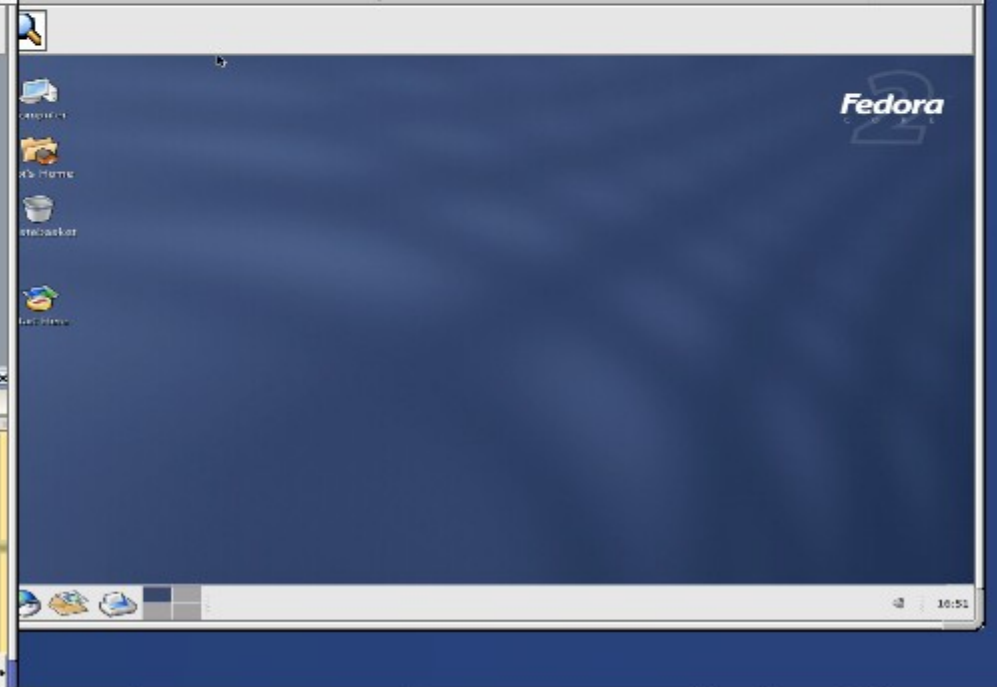
Nov  2 16:48:37 demo-nb login: ROOT LOGIN (root) ON console
NetBSD ?.? (UNKNOWN)

Welcome to NetBSD!
```

10.212.20.147:0 - Remote Desktop Connection



10.212.20.146:0 - Remote Desktop Connection



Taskbar area showing application icons (hat, globe, envelope, notepad, laptop, pie chart, printer) and window management buttons (1, 2, 3, 4). Active windows include:

- root@oss-0:~
- Remote Desktop Co
- 10.212.20.146:0 - R
- 10.212.20.148:0 - R
- 10.212.20.147:0 - R

System clock: 16:51

Xen: A Gentle Introduction

Efficient Allocation of Scarce Resources

Three good reasons for virtualisation:

- 1) Server Consolidation
- 2) Hardware Independence
- 3) Multiple OS Configurations

Xen: A Gentle Introduction

Virtualisation and Emulation

- 1) Technology dates from the 1960s
- 2) P-Code, Java VM, MAME
- 3) Native virtualisation, Hardware-enabled virtualisation, Partial virtualisation, paravirtualisation, operating system virtualisation, application virtualisation

Xen: A Gentle Introduction

Xen and Its Friends

<u>Project</u>	<u>Type</u>	<u>License</u>
Bochs	Emulation	LGPL
QEMU	Emulation	LGPL/GPL
VMware	Full virtualization	Proprietary
z/VM	Full virtualization	Proprietary
Xen	Paravirtualization	GPL
UML	Paravirtualization	GPL
Linux-VServer	Operating system	GPL
OpenVZ	Operating system	GPL

Xen: A Gentle Introduction

Xen's Structure

- 1) Xen is an open-source para-virtualizing virtual machine monitor (VMM)
- 2) A Xen system has multiple layers, the lowest and most privileged of which is Xen itself.
- 3) Xen may host multiple guest operating systems, each of which is executed within a secure virtual machine.
- 4) The first domain, domain 0 has special management privileges. Domain 0 builds and administers other domains and their virtual devices.

Xen: A Gentle Introduction

Installation

- 1) Start with minimal O.S. install
- 2) Extract and Install Xen binary, or compile and build from source
(<http://www.xensource.com/downloads/>)
- 3) Check GRUB; there should be a bootable, normal OS kernel to boot and a Xen-kernel
- 4) Detailed instructions
<https://help.ubuntu.com/community/XenVirtualMachine/XenOnUbuntuEdgy>

gy

Xen: A Gentle Introduction

Create Virtual Machines

1) Adopt configuration files for additional domains
(`/etc/xen/xmexample1`, `/etc/xen/xmexample2`)

2) Use the `create` command, to start a domain with
virtual machine ID 1 you should type:

```
# xm create -c myvmconf vmid=1
```


Xen: A Gentle Introduction

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Xen: A Gentle Introduction

Examples of Xen's Koans

Xen will typically run on laptops, but....

Xen currently runs only on the x86 architecture, requiring a "P6" or newer processor...

You must disable hyperthreading in you BIOS else your Xen Kernel will reboot indefinitely

With an IntelVT enabled system ensure that the IntelVT capabilities are enabled via the BIOS and power-cycle the system

Xen: A Gentle Introduction

Acknowledgements

Special thanks to Jonathon Oxer and Jeffrey Fernandez of Internet Vision Technologies for their support and assistance.

Xen Wiki Source: <http://wiki.xensource.com/>

Xen Users Mailing List:

Subscriptions; <http://lists.xensource.com/cgi-bin/mailman/listinfo/xen-users>

Archives; <http://lists.xensource.com/archives/html/xen-users/>