Virtualization Solutions for OS/2

Virtualization solutions

for OS/2

as host and guest operating system

Virtualization Solutions for OS/2

Abstract

With modern virtualization solutions like Innotek's/Sun's VirtualBox, VMWare, MS VirtualPC etc. you can use different operating systems on one single PC, without the need to reboot if you want to use a special application. This presentation will show some pro's and con's, it will show you some possibilities to use OS/2 or eCS as host and guest and I try to show one solution to virtualize the hardware to get OS/2 or eCS running on modern hardware. And finaly, does it makes sense to use OS/2 in a virtual environement.

VirtualBox OSE for OS/2
History 1

- In the past Innotek has published several important OS/2 applications like Odin or GCC and Odin-based ports of applications like Acrobat Reader, Sun Java, OpenOffice and Connectix VirtualPC.

- After Microsoft acquired Connectix the OS/2-port of VirtualPC was dropped.

- The first version of VirtualBox from Innotek was published on January 2007 and supported Windows and Linux as host only.

VirtualBox OSE for OS/2
History 2

- First OS/2 version of VirtualBox came out around July 2007, based on the OpenSource-Edition (OSE) and was a spare time product of some Innotek-developers (mainly Knut St. Osmundsen) and was compiled by Paul Smedley
- The latest OS/2 release is still version 1.6.1 from may 2008, compiled by Paul Smedley, this version is quite usable with Windows- and Linux-Guests but does not support OS/2 or eCS guests. Right now, there is some work on a port for VirtualBox 3.x to OS/2.

VirtualBox OSE for OS/2

Technical background 1

There are two techniques available that support to run "foreign" programs on OS/2:

- Emulation like Odin32 for OS/2 (similar to Wine for Linux) to get Windows 32-bit-programs running:

  - Every required Windows-API has to be included in the system and has to map to the corresponding OS/2-API.

  - Advantage: very fast, needs very less additional resources, good integration into the common desktop.

  - Disadvantage: not every software can be supported, changes in the Windows-API and the use of different APIs of the Windows-programs always require significant changes in the emulation.

VirtualBox OSE for OS/2

Technical background 2

- Fullvirtualization e.g. with QEMU, VirtualPC or VirtualBox:

  - A complete x86-system is emulated where you can install different operating systems including there native applications.

  - Advantage: supports foreign systems and applications as good as possible, if the operating is functioning as guest, almost every software is supported too.

  - Disadvantage: needs a lot of additional resources, guest system and applications may be much slower than on native hardware, integration in the host system is quite bad or needs special software on the guest (additions).

VirtualBox OSE for OS/2

Installation

Two options for the installation of VirtualBox OSE on OS/2:

- get the original ZIP-package from Paul Smedley:

  `http://www.smedley.info/os2ports/index.php?page=virtualbox`

- get the WarpIN-package created by Andreas Ludwig of this OS/2-port:

  `http://andreas-ludwig.info/uploads/`
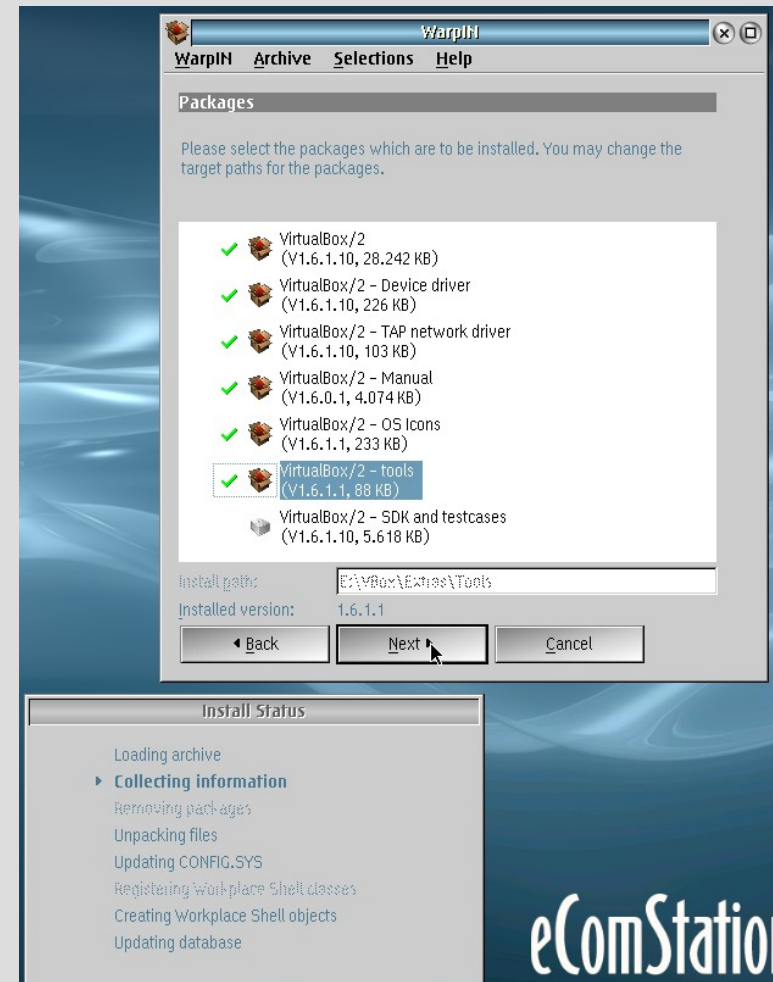
  `VirtualBox%201-6-1%20build%2010.wpi`

The WPI-package is recommended because it supports an easy way to install, upgrade and deinstall VirtualBox on OS/2.

VirtualBox OSE for OS/2
Installation 2

- To use hostinterface-networking you have to install the TAP-network driver from Willibald Meyer (included in Paul's build) and add it with MPTS to your network configuration

For additional information see the Readme.OS2, FAQ.OS2 and WHATSNEW.OS2 included in the packages!

Installing the WarpIN-package

VirtualBox OSE for OS/2

Supported systems

VirtualBox OSE for OS/2:

- works on most AMD/Intel-hardware like Pentium 3, AMD Athlon, Intel Core Duo, AMD Athlon X2 or AMD Phenom X4, 512 MB RAM are recommended if using Windows 2000/XP

- works with mostly any graphics card that uses Gengradd, Scitech Snap or Panorama VESA

- tested on IBM OS/2 Warp 4.52 (MCP2r), eComStation 1.2(r) and eComStation 2.0(rc)

- should be installed on JFS, on HPFS the file size and thus the VM-container for the virtual hard drive is limited to 2GB

- needs libc063.dll from Netlabs.org (included in eCS)

- needs sdl12 (included in installation package)

VirtualBox OSE for OS/2

Features

VirtualBox OSE for OS/2:

- can be used via command line "`VBoxManage.exe`" and "`VBoxBFE.exe`" (even remote via ssh) or with a GUI "`VirtualBox.exe`"

- supports internal, NAT- or hostinterface-network

- supports shared folders

- supports snapshots

- supports save/resume the current status of virtual machines

- supports f.ex. Windows XP, Linux openSUSE 11.x, CentOS 5.4, Ubuntu/Xubuntu, OpenSolaris 200805, Minix 3.12

VirtualBox OSE for OS/2

Limitations

The OS/2 version of VirtualBox has some limitations:

- supports only one VM running simultaneously

- no support for hardware-virtualization (VT-x/AMD-V), therefore no support for OS/2 or eComStation as guest, because VirtualBox has only ring 0+3 support in software, while OS/2 also needs ring 2. Modern CPUs do support the virtualization of all rings from 0 to 3.

- direct access to floppy disk or CD/DVD-ROM-drives is not supported, but can be used via a network-share or by including an disk-/ISO-image in VirtualBox

- Audio, serial port and USB are not supported

- shared clipboard is not supported

VirtualBox OSE for OS/2

Why OS/2 as VM-host?

Why using a virtualization-solution on OS/2 or eComStation?

- OS/2 and eCS are stable and with good performance, they have a intuitive and real object oriented GUI (WPS).

- No viruses, worms, trojans for OS/2, no FBI/BKA ...!

- Protection of investment for available hard- and software.

- The need of software that is not available for OS/2 and that does not require excessive graphic- or multimedia-access, examples are: Lotus Notes-/Domino-development, web- or software-development, configuration-programs for router etc., (Windows)-VPN-software.

- The performance loss inside a VM is minimal, in most cases it is not remarkable.

VirtualBox OSE for OS/2

Why VirtualBox OSE?

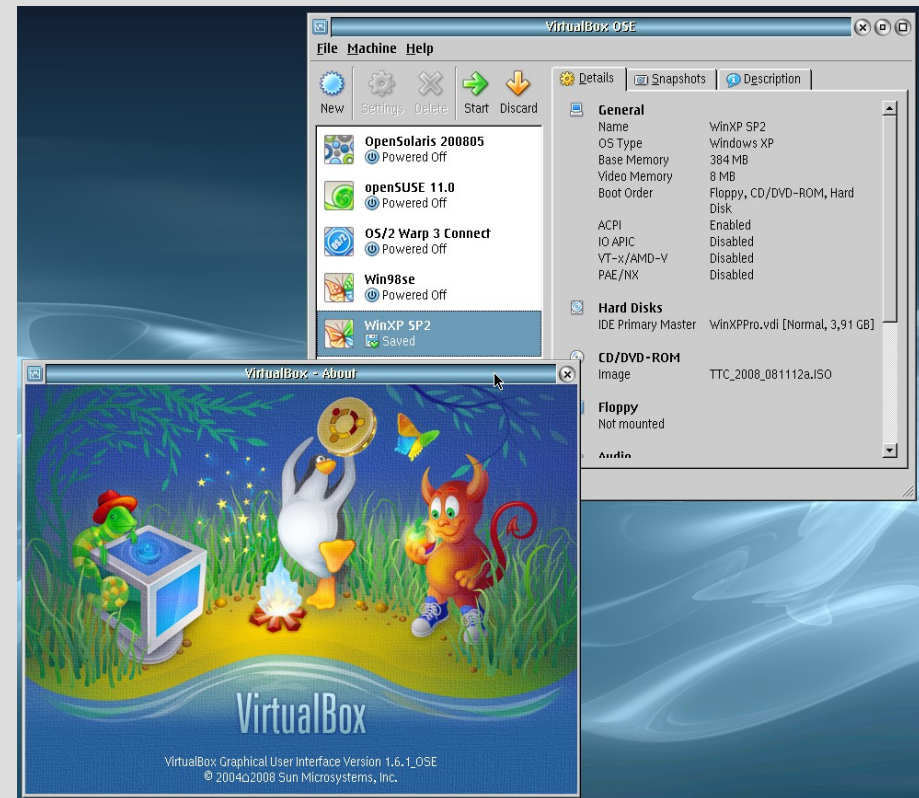Why using VirtualBox OSE as virtualization-solution on OS/2 or eComStation?

- The installation of VirtualBox, including system restart, needs only some minutes.

- The migration of a VM to an other host is done in some minutes by copying the image-file and creating a new VM-configuration.

- VirtualBox does exist also for MacOS X, Linux and Windows, the VirtualBox container (VDIs) may be used on several platforms.

- VirtualBox OSE is OpenSource and can so be used and enhanced without assistance of the original developer.

VirtualBox OSE for OS/2

Running Windows and Linux as guest

Creating a new virtual machine on OS/2 host using the GUI:

- start VirtualBox, create a new system, assign a name to it, select the OS-type, e.g. Windows XP or openSuSE

- RAM should be a minimum of 256 MB, better 512 MB

- create a new hard drive image, size should be minimum 8 GB

Starting VirtualBox OSE - About
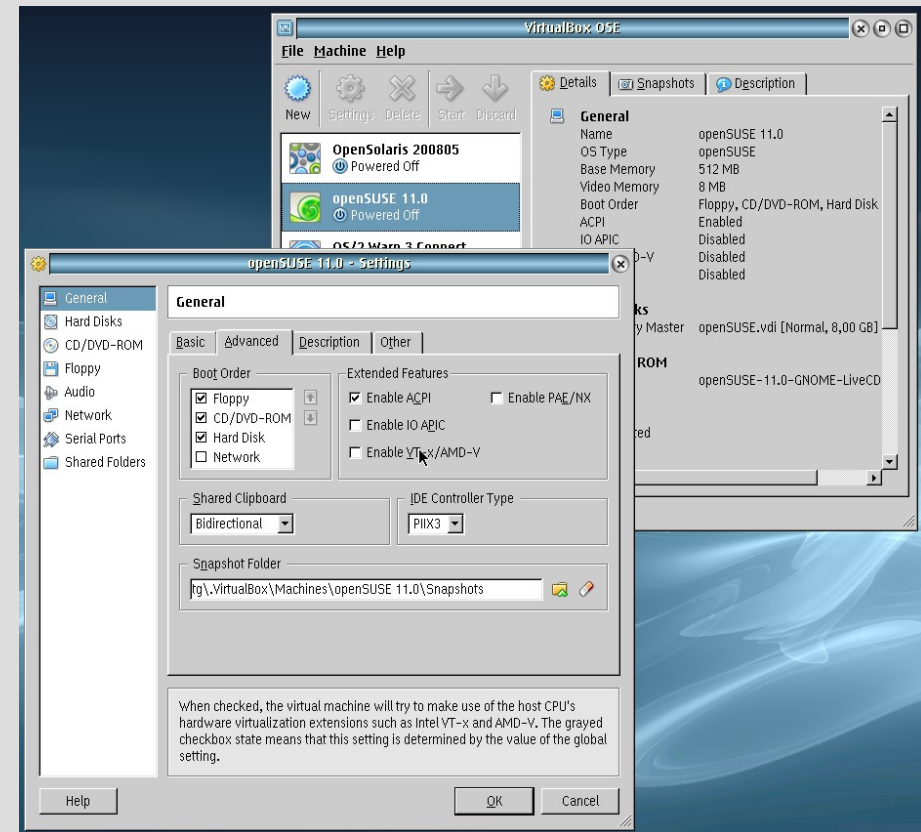
VirtualBox OSE for OS/2
Settings - General

- after creation change the settings of this virtual machine:

  - General:

    - Basic: no changes required

    - Advanced:

      - Boot Order: should be CD/DVD-ROM, then Hard Disk, Floppy is not needed

      - Extended Features: only ACPI should be enabled

      - Shared Clipboard: not supported yet

      - IDE Controller Type: for better compatibility you may choose PIIX3, ATTENTION: this CAN'T be changed after installation of Windows!

VirtualBox OSE for OS/2

Settings - General

- General 2:

  - Snapshot Folder: by default this folder is located in HOME, a better place would be the directory where you placed your VDIs and where you should have enough disk space on your local hard drive.
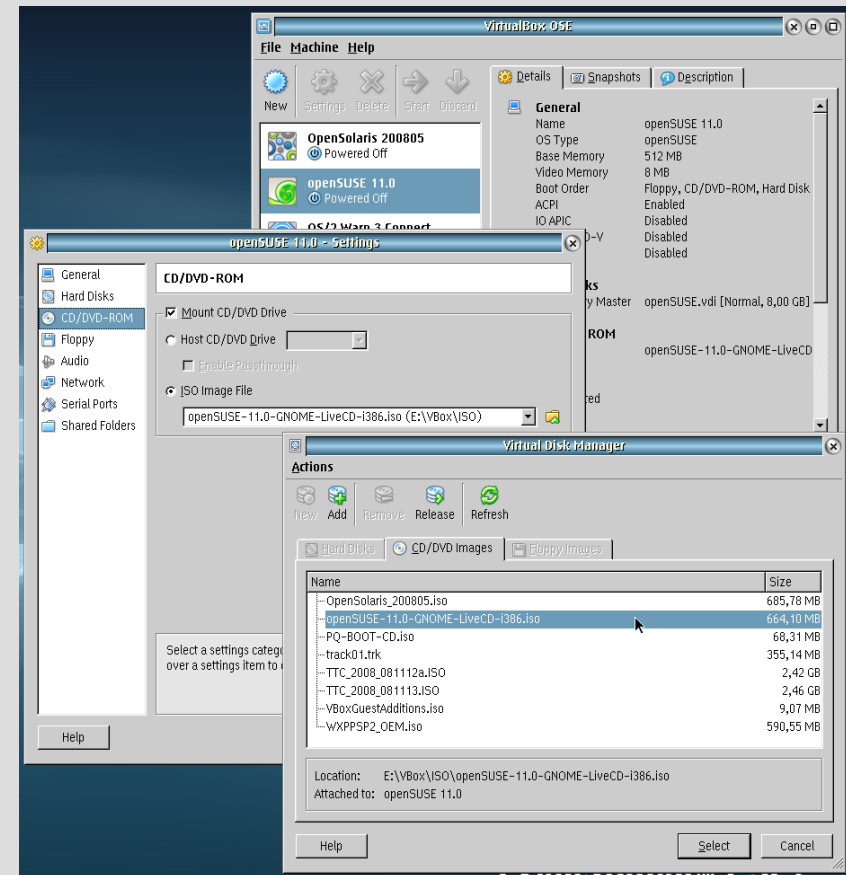

General settings

VirtualBox OSE for OS/2

Settings - HDD, CD/DVD, FDD, Audio

- further settings:

  - Hard Disks: the virtual disk image attached to the guest

  - CD/DVD-ROM:

    - Mount CD/DVD Drive:

      - ISO Image File: select the installation ISO-image of Windows or openSuSE

  - Floppy: not needed
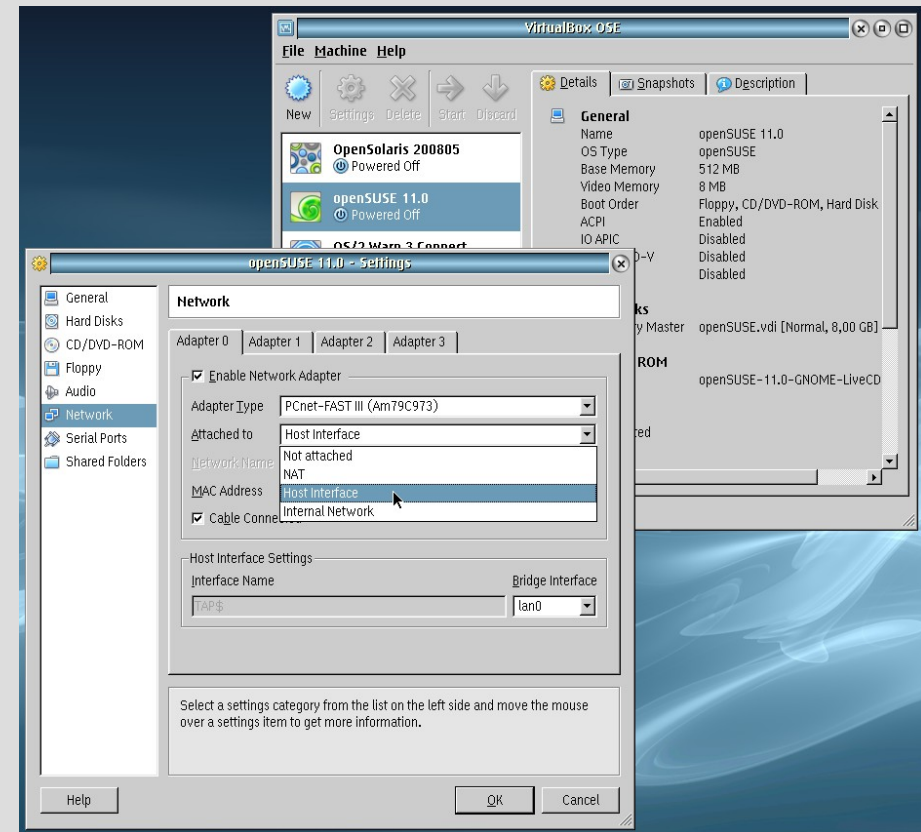
  - Audio: not supported yet

CD/DVD-ROM settings

VirtualBox OSE for OS/2

Settings - Network

- Network:

  - Adapter 0: Enable Network Adapter

    - Adapter Type: PCnet-FAST III (Am79C973)

    - Attached to: NAT, Host Interface or Internal Network

I never had the need to use several network adapters, so I don't have experiences with that on OS/2-host.

Network settings

VirtualBox OSE for OS/2

Settings - Network

- Differences between the network-modes:

    - NAT means that DHCP has to be enabled in the guest and VirtualBox distributes an internal IP-address to that guest and works as a router to the host-network, no services are reachable within the guest from the outside

    - Host Interface needs Willibalds TAP-driver installed on OS/2-host, but gives direct access to the host-network, the IP-address can be a fixed one from the host-network range or can be obtained with DHCP from a DHCP-server that resides in the host-network, all services that are running on the guest are accessible from the outside

    - Internal network means that there is no connection to the outside from the virtual machine

VirtualBox OSE for OS/2
Settings - Serial, Shared Folders

- Serial Ports: not supported

- Shared Folders:

    - select a folder to share, this may be a local folder, the CD/DVD-ROM and even a network- or NetDrive-share

    - choose a folder name that will be the share in the guest, to get access to that folder you can mount a local drive in your VM pointing to that share on Windows with "`NET USE x: \\vboxsvr\PUBLIC`" or for Linux etc. do a "`mount -t vboxsf PUBLIC /home/myname`", GuestAdditions have to be installed for this to work

    - select/deselect Read-only

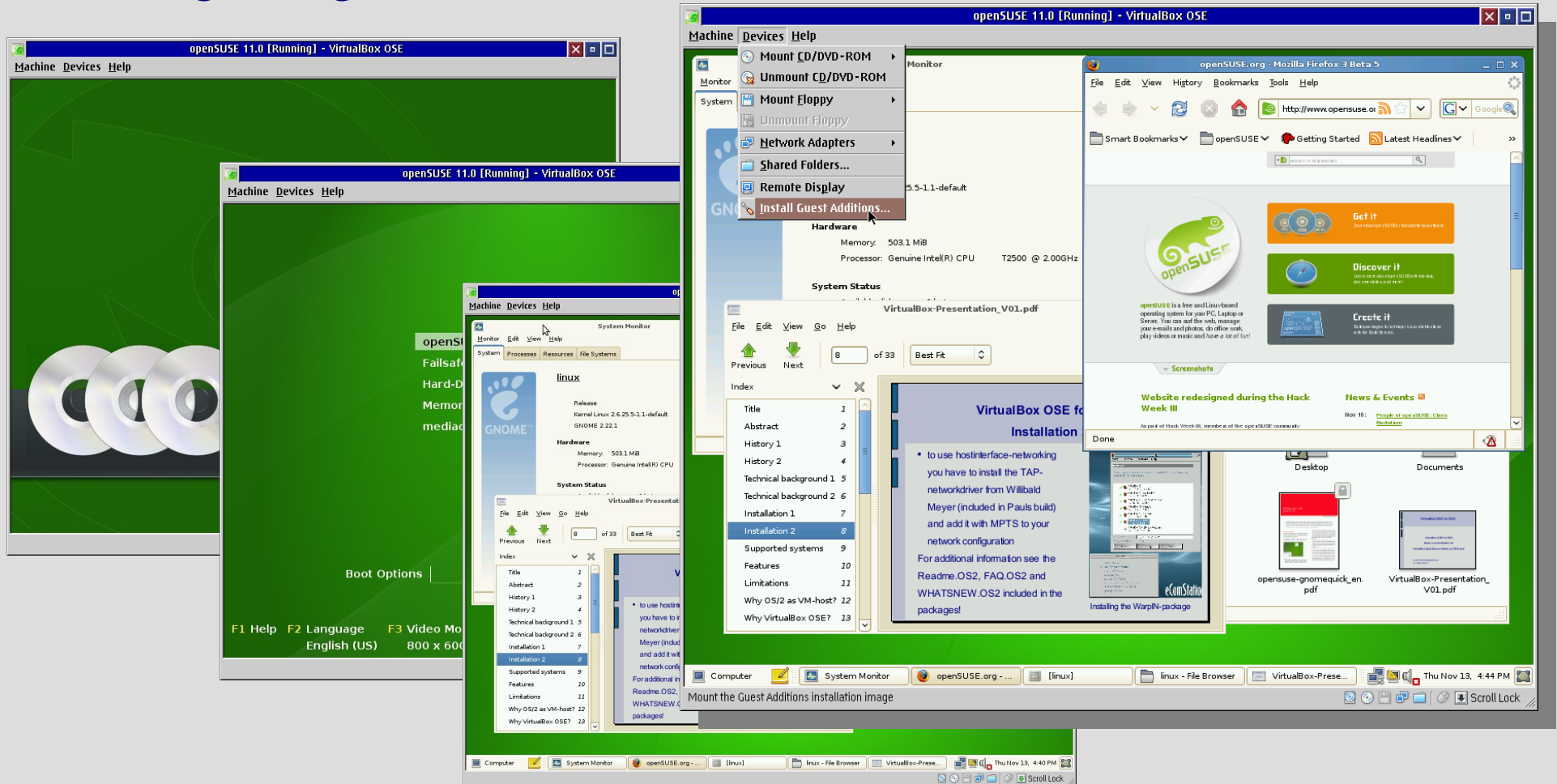# VirtualBox OSE for OS/2
Using unsupported adapters

Installing the new virtual machine:

- start the freshly created virtual machine

- start the installation of the guest operating system as you would do normally by booting from the installation media

- after having finished the guest OS installation, install guest additions (available for Windows, Linux and OS/2) in the VM by selecting "Devices" - "Install Guest Additions", to get

  - support for mouse-pointer integration

  - better video support

  - time synchronization

  - shared folders and others

VirtualBox OSE for OS/2
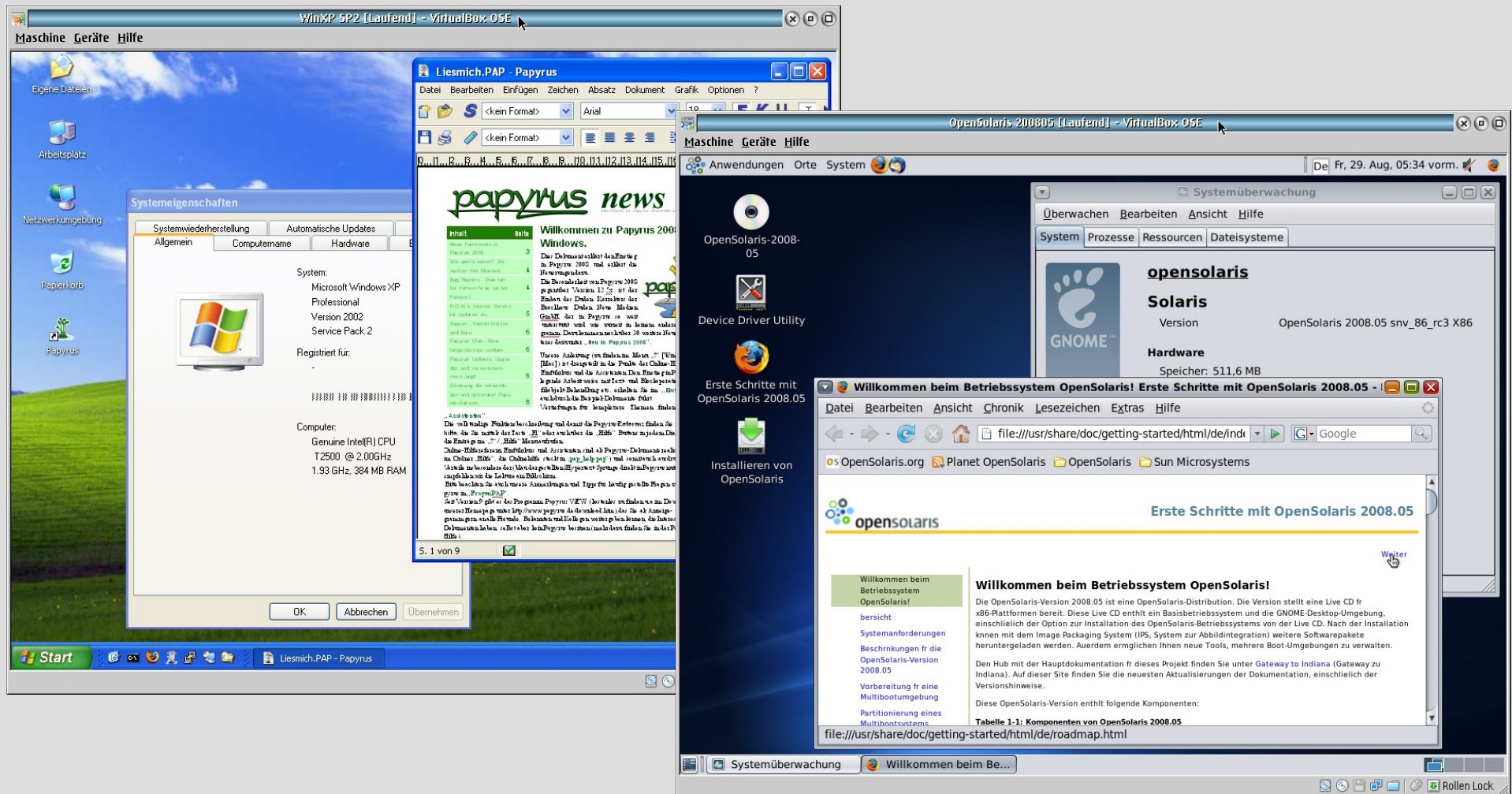
Running Guest Systems

Installing openSuSE 11.0 as guest operating system ... and installing the guest additions:

VirtualBox OSE for OS/2

Running Guest Systems

Some other running guest operating systems:

VirtualBox for MacOS X

Running eComStation as guest

I was not able to install eCS 2.0 on VirtualBox 3.1.6/3.1.8 on MacOS X 10.6.

After downgrading to version 2.2.4 I was able to complete the installation, the final image also was running on VirtualBox 3.1.8 later.

Most steps to create a new VM are similar to the old OS/2-version of VirtualBox.
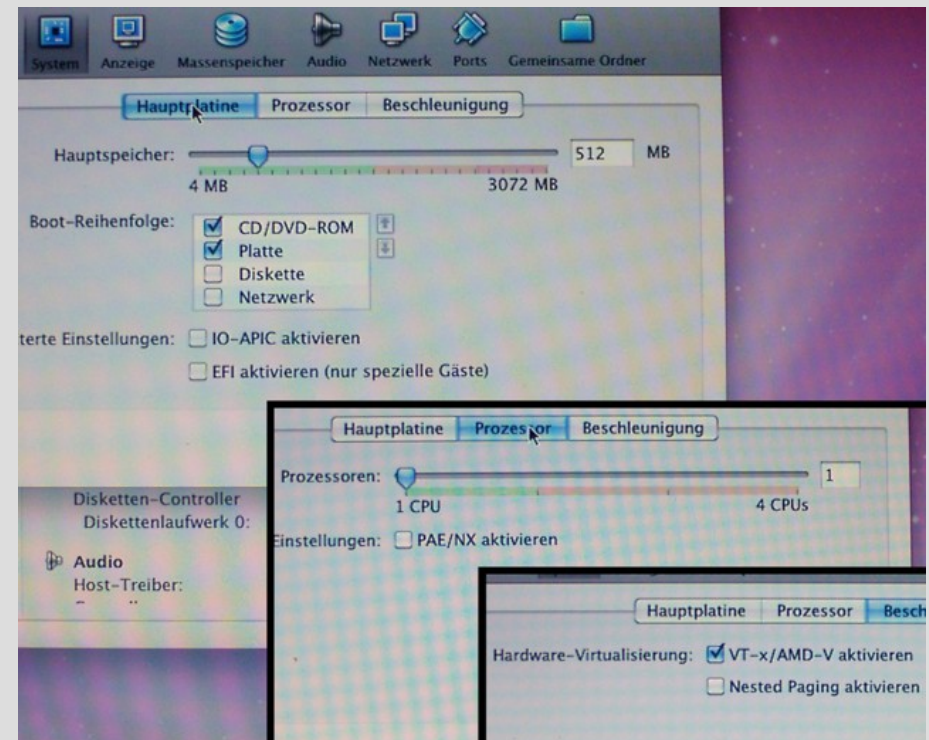

eCS 2.0 on VirtualBox for MacOS X

VirtualBox for MacOS X
Running eComStation as guest

The important settings:

- System (Board, CPU, Accel)

  - deselect IO-APIC, EFI

  - deselect PAE/NX

  - select VT-x/AMD-V

  - deselect Nested Paging

- Storage

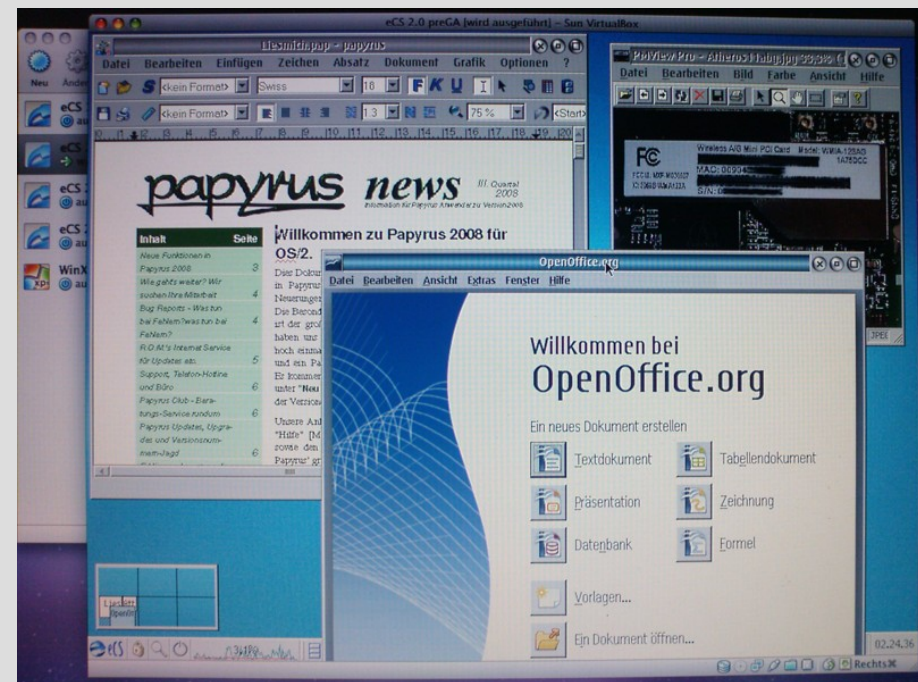 - IDE-Controller ICH6

- Network

  - Adaptertype: Pcnet-FAST III

Screenshot of important settings

VirtualBox for MacOS X
Running eComStation as guest

For installing the OS/2-additions mount the GuestAdditions-ISO.

- In the VM select the CD-ROM go to \32bit\OS2 and refer to the readme.txt that describes how to install them.

- The OS/2-additions provide

  - Mousepointer integration

  - better Video support

  - time syncronization

  - Shared folder and Window resizing are not supported.

Papyrus 2008, PMView 3.6 and OpenOffice.org 3.1 in the eCS 2.0-VM

VirtualBox OSE for OS/2
Outlook

- The OS/2-version of VirtualBox is based on the OSS-version where the source code is freely available.

- As long as there are skilled OS/2 developers who are doing an OS/2 port we can use VirtualBox, but as far I know there is no more support from Innotek/Sun-developers to get VirtualBox running on OS/2.

- The latest version of VirtualBox OSE that is working on OS/2 is 1.6.1, Paul Smedley told me long time ago, that later SVN code crashes on disk IO while compiling, but since some time there is work done, to port version 3.x.

VirtualBox OSE for OS/2

Outlook

- After QT4 was ported to OS/2 and eCS, there is the possibility to get VirtualBox with the GUI to manage virtual machines.
- The possibility of using other operating systems in a VM under OS/2 or eCS is a "life extender" for it, as far as OS/2 or eCS as host system runs stable on the used hardware.

OS/2 or eCS as Main-System in a VM Outlook

- VirtualPC from MS still has good OS/2-guest compatibility.
- VirtualBox from Innotek/Sun needs a CPU with HVM and I had stability problems with Vbox 3.16/3.18 on MacOS X, the 2.2.4 on WinXP worked better but not 100% stable.
- VMWare also supports OS/2 and eCS as guest, I have no clue how good/stable it works.
- Network does not work always correct, f.ex. I am not able to connect my OS/2 server from eCS running in a VM.
- Audio works only with poor quality.

OS/2 or eCS as Main-System in a VM Outlook

- A lot of important applications for OS/2 are ported from other operating systems like Linux:

  - Mozilla Firefox, Thunderbird, Seamonkey

  - OpenOffice.org for OS/2 and eCS

  - a huge number of Paul Smedleys great OS/2-ports

- On OS/2 the compilers are not that stable, debugging tools are missing, skilled programmers who adapt the ports to OS/2 are missing.

- Most OS/2-ports are less stable than on other platforms.

OS/2 or eCS as Main-System in a VM

Outlook

- Using OS/2 in a VM does only solve problems with the hardware compatibility. Others, like limitations of the shared memory, missing core applications (Java, Flash) still remain in the virtual environement.

- How many OS/2-only application do you use, that it makes sense to virtualize your whole OS/2-system?

- Does it really makes sense to use Firefox or OpenOffice in an eCS-VM, while your host-systems runs them much better?

VirtualBox OSE for OS/2
Links

- VirtualBox.org project site:

  http://www.virtualbox.org/

- VirtualBox.org forum for end-users:

  http://forums.virtualbox.org/viewforum.php?f=10

- Paul Smedleys port of VirtualBox OSE:

  http://www.smedley.info/os2ports/index.php?page=virtualbox

- WarpIN-package of Paul's port created by Andreas Ludwig:

  http://andreas-ludwig.info/uploads/VirtualBox%201-6-1%20build%2010.wpi

- C&L freeX 06/2008 article "VirtualBox für OS/2" as PDF:

  http://www.cul.de/freex.html

VirtualBox OSE for OS/2

Links

- Netlabs.org download for libc063 and sdl12:

    ftp://ftp.netlabs.org/pub/libc/

    ftp://ftp.netlabs.org/pub/sdl/

- Home of eComStation:

    http://www.ecomstation.com/

- Home of Scitech Snap, not supported any more:

    http://www.scitechsoft.com/

- Home of Panorama VESA, only available with eCS:

    http://en.ecomstation.ru/projects/panorama/

VirtualBox OSE for OS/2

Credits

I would like to thank Knut St. Osmundsen very much

for the great work to make an

OS/2-port of VirtualBox OSE possible at all,

and Paul Smedley for all of his ports to OS/2,

including VirtualBox OSE.

Without Paul's ports of Linux-software to OS/2 and

eComStation they would not have been usable anymore!

VirtualBox OSE for OS/2

Thanks

for your attention!