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The OS/2 Migration Solution

Integrating Windows and OS/2 through virtual machines

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Transition issues with OS/2

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- Many large companies have built comprehensive environments on top of OS/2.
- Migration is necessary:
  - OS/2 support ends in a few years
  - Non-OS/2 application support (i.e. Win32) becomes more and more important
  - Legacy OS/2 applications might not run on latest OS/2 versions
- After a migration to Windows, native OS/2 applications cannot be used any more.
- Porting from OS/2 to Win32 usually is a waste of resources - no direct business advantage
  - legacy applications should be "frozen" until they can be reengineered to provide direct business advantages (e-business, WebSphere...)

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Possible solutions

- **Citrix Metaframe / Windows Terminal Server**
  - + enables Win32 application support on OS/2 desktops.
  - + very compatible
  - + centrally managed
  - – server farms need to be built, local PC processing power remains unused
  - – high network infrastructure requirements (especially for printing)
  - – license costs
  - – no solution for stand-alone machines (notebooks...)
- **Virtual Machine technology**

Virtual Machine

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- "A virtual machine is a software that emulates a computer and runs standard operating systems with standard applications. These programs do not notice they run on a virtual machine."

- Popular examples:
  - IBM VM Operating System
  - IBM Win-OS/2
  - VMware (and derived products)
  - **Connectix Virtual PC**

The Connectix / InnoTek Virtual Machine Solution

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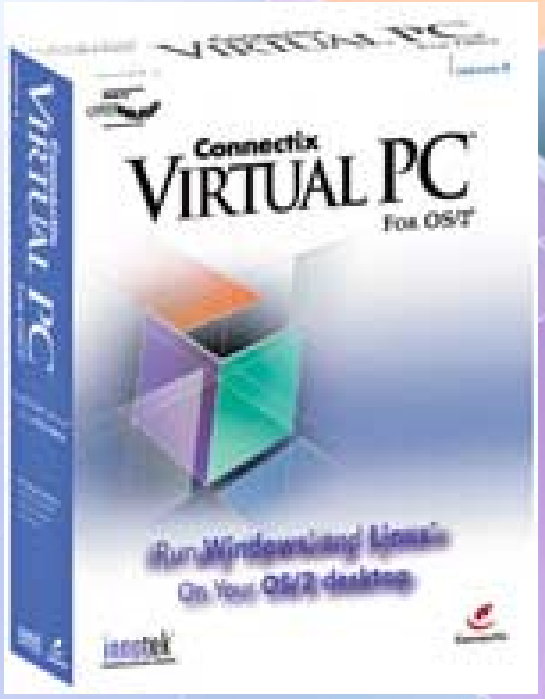
- A cross-platform product based on licensed technology from Connectix Corporation:



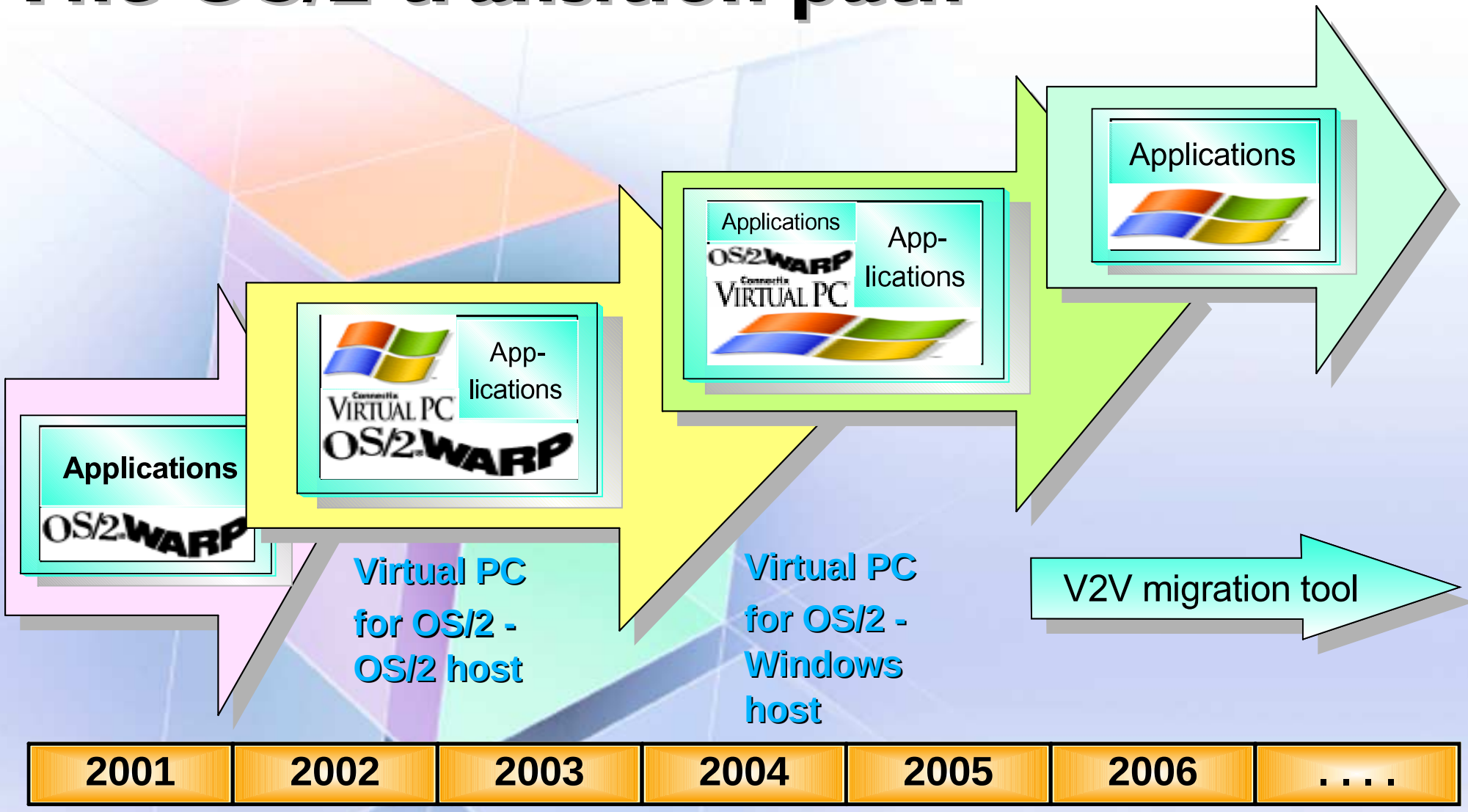
Virtual PC for OS/2

Virtual machine product running on top of OS/2 and Windows, supporting any x86 operating system as a guest with an emphasis on 32bit Windows (Win32) and OS/2.

Designed for
Microsoft®
Windows® XP
Windows® 2000
Windows NT®

- **Extending OS/2 to be able to run Windows on top of it**
- **Enabling customers to run OS/2 as a guest OS on Windows.**

The OS/2 transition path



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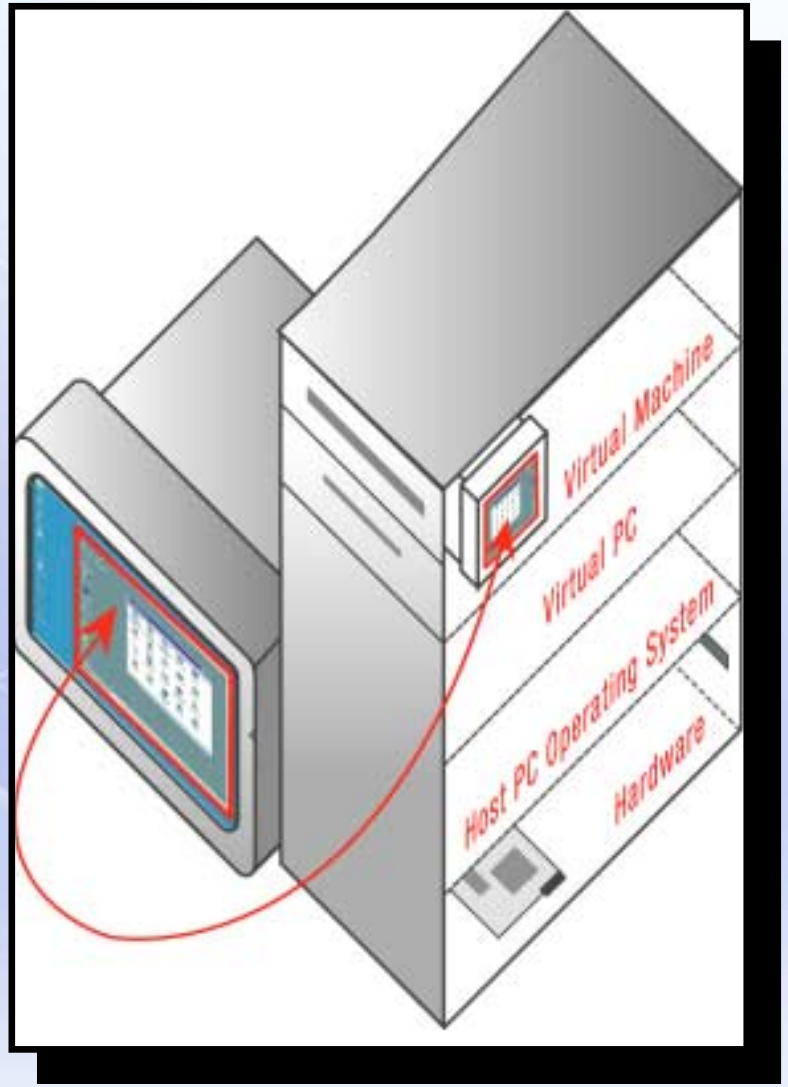
Some terminology...

- **HOST**

  The host is the machine or operating system that is running on the physical hardware. Virtual PC is an application running on the host system.

- **GUEST**

  Operating system running inside of a virtual machine, accessing the virtualized hardware.



What does the guest OS see?

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- Physical processor with all features such as MMX, SSE, SSE2, 3DNow, FPU
- As much RAM as you assign to the VM (note: RAM gets physically allocated by Virtual PC!)
- Intel 440BX chipset (2 IDE channels, etc.)
- PS/2 mouse
- 2 COM ports, 1 LPT port
- S3 Trio64 PCI graphics card
- Soundblaster 16 card
- DEC/Intel 21140 PCI network card
- virtual hard disk drives offering multiple options
  - more can be added per customer demand!

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Virtual PC design goals:

- Virtualization must be as fast as possible. Any overhead needs to be avoided. Being able to use hardware structures gives a huge speed advantage due to a mixture between native execution and emulation.
- As code is thoroughly scanned before execution, it is guaranteed that system integrity is always preserved. A guest OS cannot crash or influence the host OS.
- Guest OS appears to be a standard process in the host OS providing excellent multitasking.

Hard disk drive support

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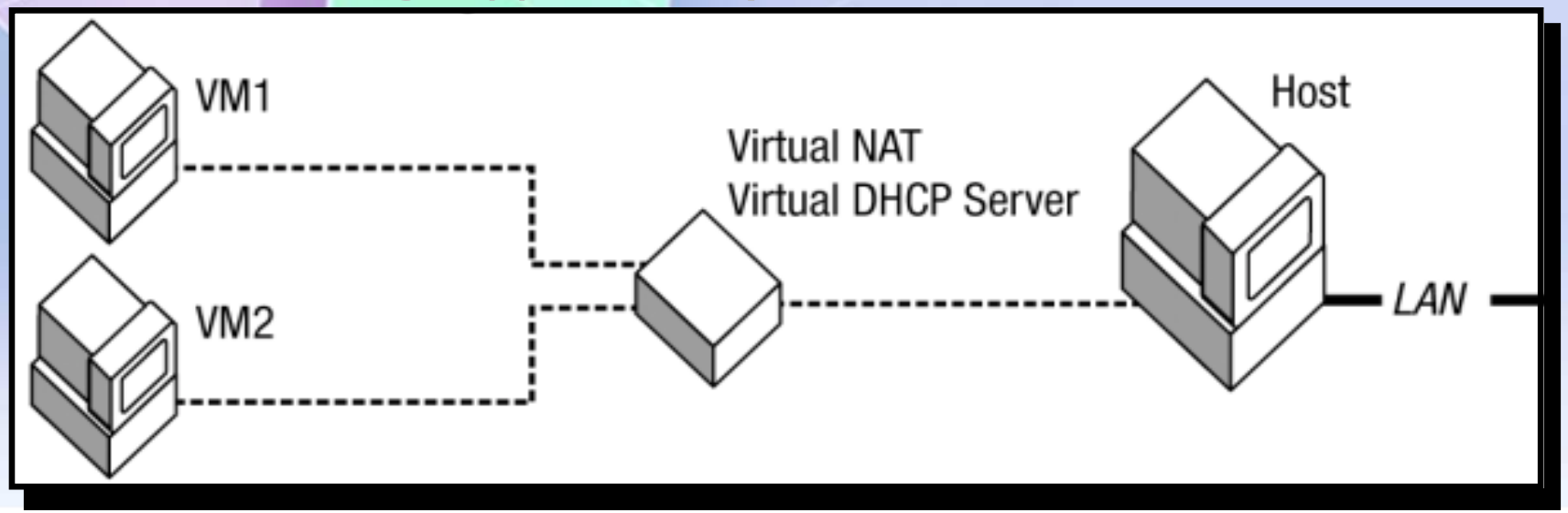
- Usually guest hard drives are mapped to container files on the host OS. There are several options:
  - fixed size container files
  - dynamically expanding container files that only occupy the space that is actually containing data
  - undoable drives support commit or discard at the end of the guest OS session
  - differencing drives support a base image and maintain a delta file - excellent for network usage!
- Also, access to dedicated physical hard drives or partitions is possible (not very elegant though)

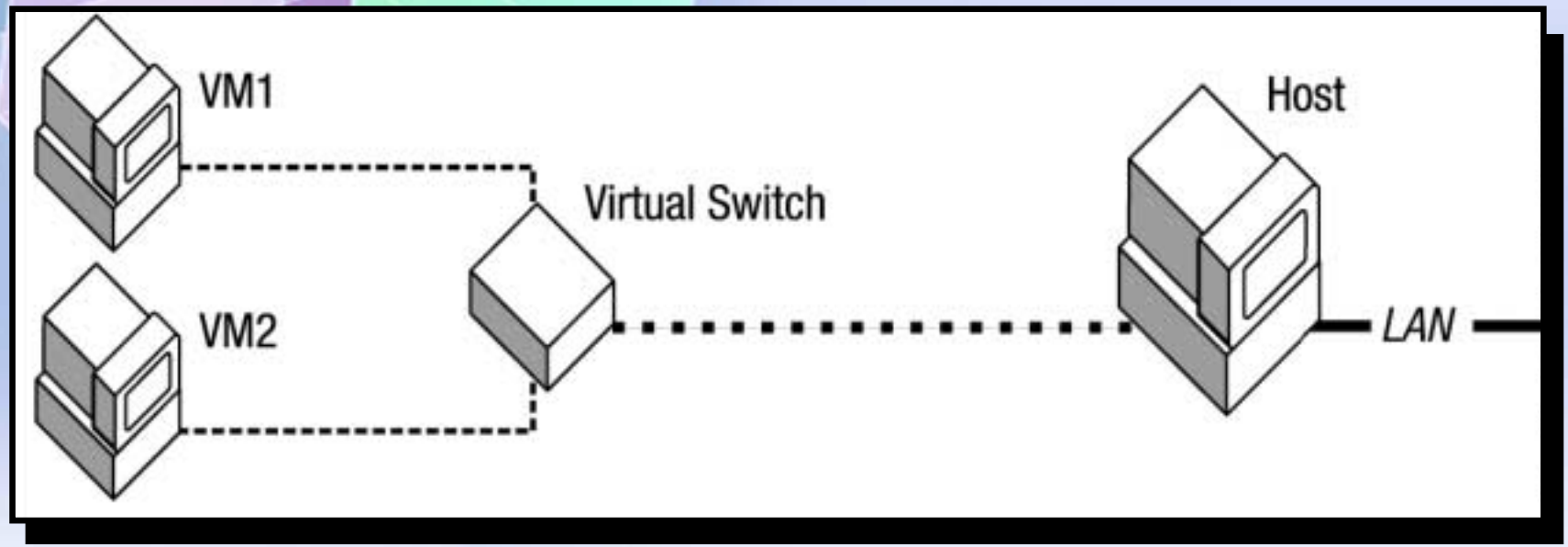
Networking support

- Guest OS needs device driver for DEC/Intel 21140 card.
  Several networking modes available:
  - **No Networking**...
  - **Shared Networking**, guest will use IP connection of host through integrated NAT engine. Only supports IP.
    Integrated DHCP server in virtual machine.
    Full Token Ring support today



Networking support (cont...)

- **Virtual Switch Networking**, requires special NDIS filter driver on host. Each virtual machine appears with its own MAC address on the network. All networking protocols are supported. Virtual machines can even run server software because it is accessible from the whole network.
  Token Ring support under development



Additions for tight integration

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- Additions are a set of device drivers written for certain guest OSes that provide tight guest/host integration and more performance:
  - host mouse pointer integration, mouse pointer of the host OS can be used in the guest, no need to capture/uncapture
  - shared folder support, directories on the host can be mounted as drive letters inside the guest OS
  - clock synchronization
  - special graphics driver for enhanced performance (instead of standard S3 Trio 64 driver)
  - clipboard integration
  - guest OS shutdown from VPC menu
- Windows Additions for Windows 95/98/Me/NT/2000/XP
- OS/2 Additions for OS/2 Warp 3 and higher.

New in Virtual PC Version 5.0:

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- Performance enhancements - significantly faster than V4, specific enhancements for Windows NT/2000/XP and OS/2 guests
- AMI BIOS - modern, ACPI aware BIOS replaces previous MR BIOS. BIOS settings are now stored persistently in the registry.
- Improved User Interface - numerous simplifications (i.e. no more modal dialog boxes)
- Upgraded Ethernet NIC - previous 10MBit 21041 model was replaced by a 100MBit 21140 chip with automated link detection (i.e. to rerequest a DHCP lease after a Suspend)
- Better Host CPU usage control
- VNC optimizations - i.e. 8bit color depth

VPC Hardware requirements

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- 400 MHz or higher CPU, 600 MHz recommended, MMX
- RAM for the host OS and for the guest OS that will be run, depending on type of guest OS:
  - OS/2: 32MB
  - Win9x: 48MB
  - Win 2000/XP: 96MB
  - ...
- Hard disk space for the virtual hard disk container files, depending on type of guest OS
  (OS/2: 300MB, Win98: 500MB, Win2k/XP: 2GB).

OS compatibility

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- **TODAY**
  - OS/2 Warp
  - Windows XP
  - Windows 2000 SP2 and higher
  - Windows NT 4.0 SP6 and higher
  - Windows Me
  - Windows 98SE

- **TOMORROW**
  - Virtual PC is **officially** certified by Microsoft
    - Optimal compatibility with future Windows versions

Virtual PC benefits

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- Virtual PC for OS/2 - OS/2 host:
  - the Windows roll-out is as simple as distributing a file!
    - no Windows administration skills necessary
    - system backup & recovery is done by copying the VHD file
  - Windows is running in a window
    - it doesn't have control over your hardware
    - prevents viruses from spreading (NAT)
    - it can be stripped down to be a "Win32 Application engine", no infrastructure changes necessary
  - it works on both connected and standalone PC's

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Virtual PC benefits (cont.)

- Virtual PC for OS/2 - Windows host:
  - one OS/2 image works on all PC's
    - independent of actual hardware used
    - you will never need a new OS/2 device driver again!
    - the OS/2 image can be completely "frozen"
    - OS support becomes less critical
  - the OS/2 roll-out is as simple as distributing a file
    - no OS/2 administration skills necessary
    - system backup & recovery is done by copying the VHD file
  - the only way to run OS/2 applications under Windows!

VPC education

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- IBM offers a 3-day technical training session for Virtual PC for OS/2 (on OS/2 and Windows):
  - Nov. 4-6, 2002
    IBM Munich, Germany
    class code: TAVPE0DE
  - Nov 13-15, 2002
    IBM Chicago, IL
    class code: VG8T
  - online booking at:
    http://www.ibm.com/services/learning/
  - class fee is $2,200

Purchase options

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- Connectix and InnoTek co-market this solution worldwide
- Connectix sells directly to large account customers in US and AP
- InnoTek focuses on distribution in EMEA
- Suggested retail price:
  - 359 USD / 389 Euro - contains Virtual PC for OS/2 with OS/2 and Windows host support (one seat, customers can choose their platform)
  - **Enterprise licenses, volume discounts and support contracts are available**

Contact information

- **Connectix**

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  Inquiries: info@connectix.com

  Web sites:
  http://www.connectix.com/products/vpcos2.html
  http://www.connectix.com/support
  (product information, brochures, whitepapers, FAQ, discussion fora, downloads, tips & tricks, etc.)

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