

Stacking Virtual Machines

How to mess stuff up...

Konrad Lorincz
Kevin Redwine
Alex Sheh

Harvard University
March 19, 2003

What we Did

Via stacking VMs, we tried to answer the following:

- **How Robust?**
- **How Pure/Impure?**
- **How Usable?**

Experiments & Results

Experiments

- VMware on top of VMware
- VirtualPC on top of VMware
- VirtualPC on top of VirtualPC
- VMware on top of VirtualPC

Results:

- ◆ Stacking VMs failed for all cases, but in interesting ways

VMware on VMware

- The VMware installation program detects that it is running inside another VMware, and refuses to install.
- The installer exits gracefully with an error message.

VMware on VMware



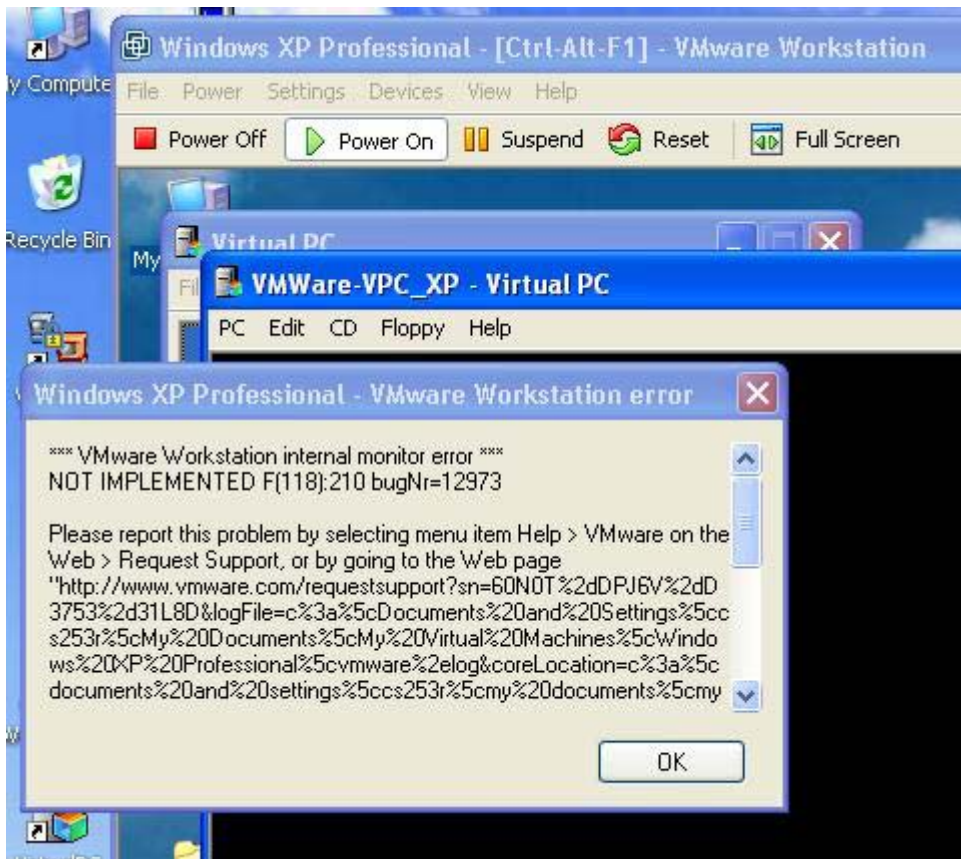
VirtualPC on VMware

- VirtualPC installation appears to complete successfully.
- After reboot, and upon running VirtualPC, VMware issues the following error:

*** VMware Workstation internal monitor error ***NOT
IMPLEMENTED F(118):210 bugNr=12973

- After clicking OK, the VMware instance crashes.

VirtualPC on VMware



Possible Reasons ?

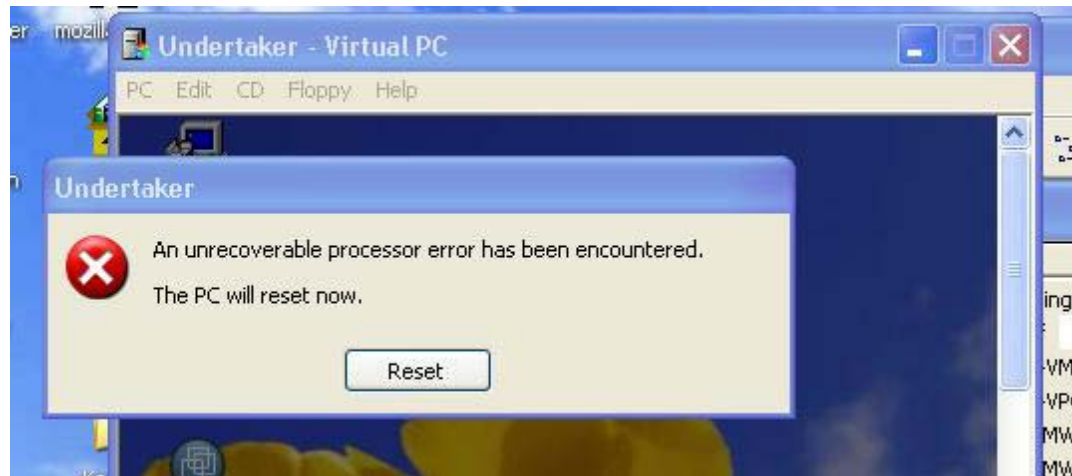
***** VMware Workstation internal monitor error ***NOT IMPLEMENTED F(118):210 bugNr=12973Please report this problem by selecting menu item Help > VMware on the Web > Request Support, or by going to the Web page**

"<http://www.vmware.com/requestsupport?sn=60N0T%2dDPJ6V%2dD3753%2d31L8D&logFile=c%3a%5cDocuments%20and%20Settings%5ccs253r%5cMy%20Documents%5cMy%20Virtual%20Machines%5cWindows%20XP%20Professional%5cVMware%2elog&coreLocation=c%3a%5cdocuments%20and%20settings%5ccs253r%5cmy%20documents%5cmy%20virtual%20machines%5cwindows%20xp%20professional%5cvmware%2dcore>".

Please provide us with the log file (c:\Documents and Settings\cs253r\My Documents\My Virtual Machines\Windows XP Professional\vmware.log) and the core file (c:\documents and settings\cs253r\my documents\my virtual machines\windows xp professional\vmware-core).If the problem is repeatable, please select 'Run with debugging information' in the Options panel of the configuration editor. Then reproduce the incident and file it according to the instructions.We appreciate your feedback, -- the VMware Workstation team.

VirtualPC on VirtualPC

- Half way through the installation, the host VirtualPC issues an “*unrecoverable processor error*” and forces us to click **reset**.



VirtualPC on VirtualPC

- Upon reboot, the host VirtualPC becomes unstable
 - ◆ It declares that it found new hardware of type **System**



- ◆ When we tried to uninstall the guest VirtualPC, we again encounter the “*unrecoverable processor error*” and forced reset.
- ◆ If we try to install the “New Hardware – System” and uninstall VirtualPC we enter an “*unrecoverable processor error*” and forced reboot cycle.

VirtualPC on VirtualPC

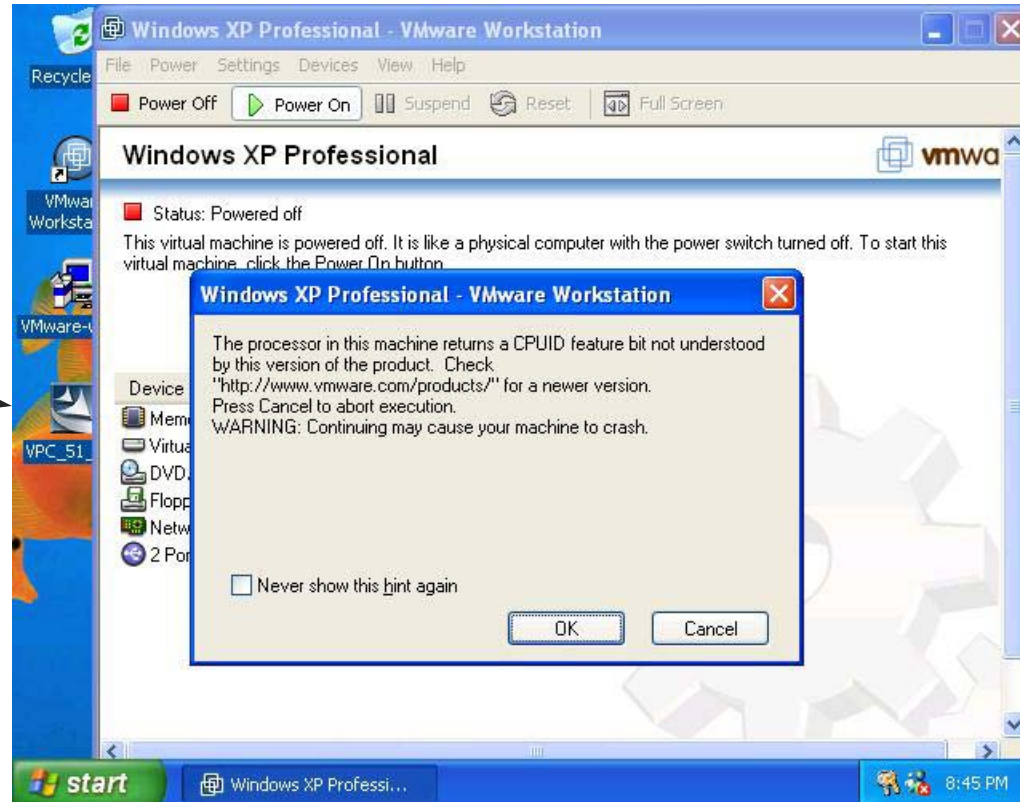
- When we try to run the half installed VirtualPC, it mocks us ...



VMware on VirtualPC

- Installation appeared to complete successfully.
- When we try to run it, VMware gives us the following warning.

VirtualPC
desktop



VMware on VirtualPC

- So, what do you think happened next?
 - ◆ => The VirtualPC instance crashed
 - ◆ VirtualPC gives no indication that the instance crashed or that something bad happened.

Why doesn't stacking work?

- VMware – from newsgroup

> >No, you can't install VMware inside VMware.

>

> you can't `_run_` it. however, installation should not really be a problem.

> though the 2.x products used to check and refuse to install in a virtual

> machine. don't know whether that's still the case in the release versions

> of 3.0.

>

> >Maybe something like "Bochs inside VirtualPC inside VMware" might work.

> >I'm kinda interested in "virtual machine inside virtual machine"

> >configuration myself, though I suspect there's no practical use of it.

> >Are there anyone crazy enough to try this?

> connectix vpc and vmware workstation won't run inside each other (any

> combination), at least, last time i tried. i doubt anything has changed

> enough on vpc's side to make it possible now. never tried bochs.

Why doesn't stacking work?

- VirtualPC – from discussion board

David A. Mayer's response:

“Because the Intel CPUs don't support multiple ring zero contexts so you can only have one running kernel. IOW, a large part of the CPU architecture is unavailable to guests and is emulated via privilege violation exceptions. However, search the forums Eric Traut, Connectix CTO (former I suppose), documented a registry hack that turns off the check but you are on your own if using it.”

Usability Observations

- Accessing Host OS Disk
 - ◆ Both VMs allows you to mount host partitions of the same file system (Linux partitions didn't mount)
 - ◆ Mounting in VMware is slight complicated:
 - » VM instance must be powered off
 - » Must explicitly specify read/write permissions
 - ◆ Mounting in VirtualPC is easier:
 - » Install "Additional tools" once at the beginning
 - » Don't need to power off VM instance or explicitly specify permissions
 - » Finer grained sharing: partitions/folders/files