Open Source Technology Center

Evolution In Kernel debugging using VT-x and Xen

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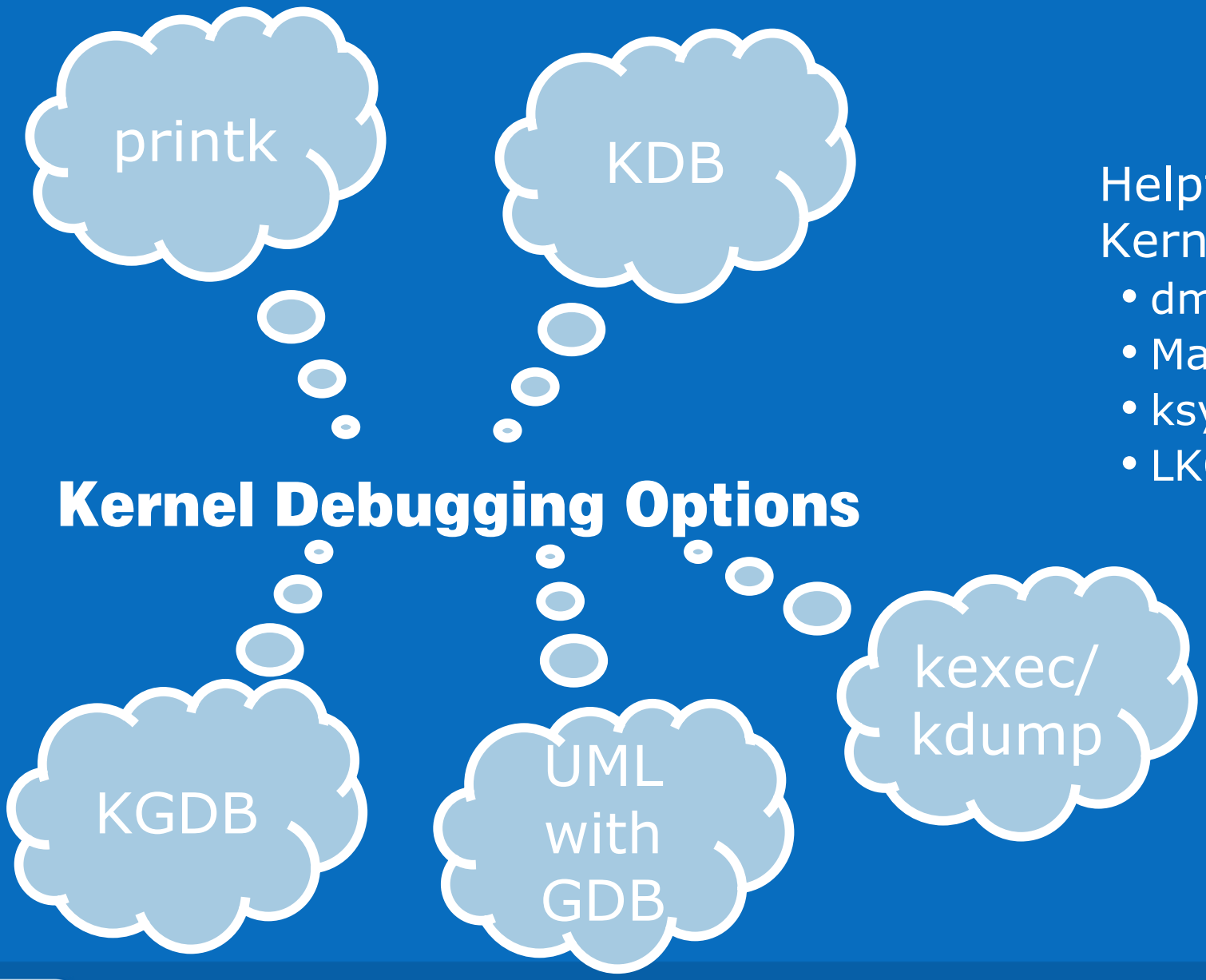
Agenda

- Options for Kernel Debugging
- Introduction to VMX operation
- Full Virtualization using Xen 3.0 and Intel® Virtualization Technology®
- Architecture of debugging unmodified OS with Xen and VT
- Linux Kernel Debugging Live Demo on Merom laptop
- Legal information

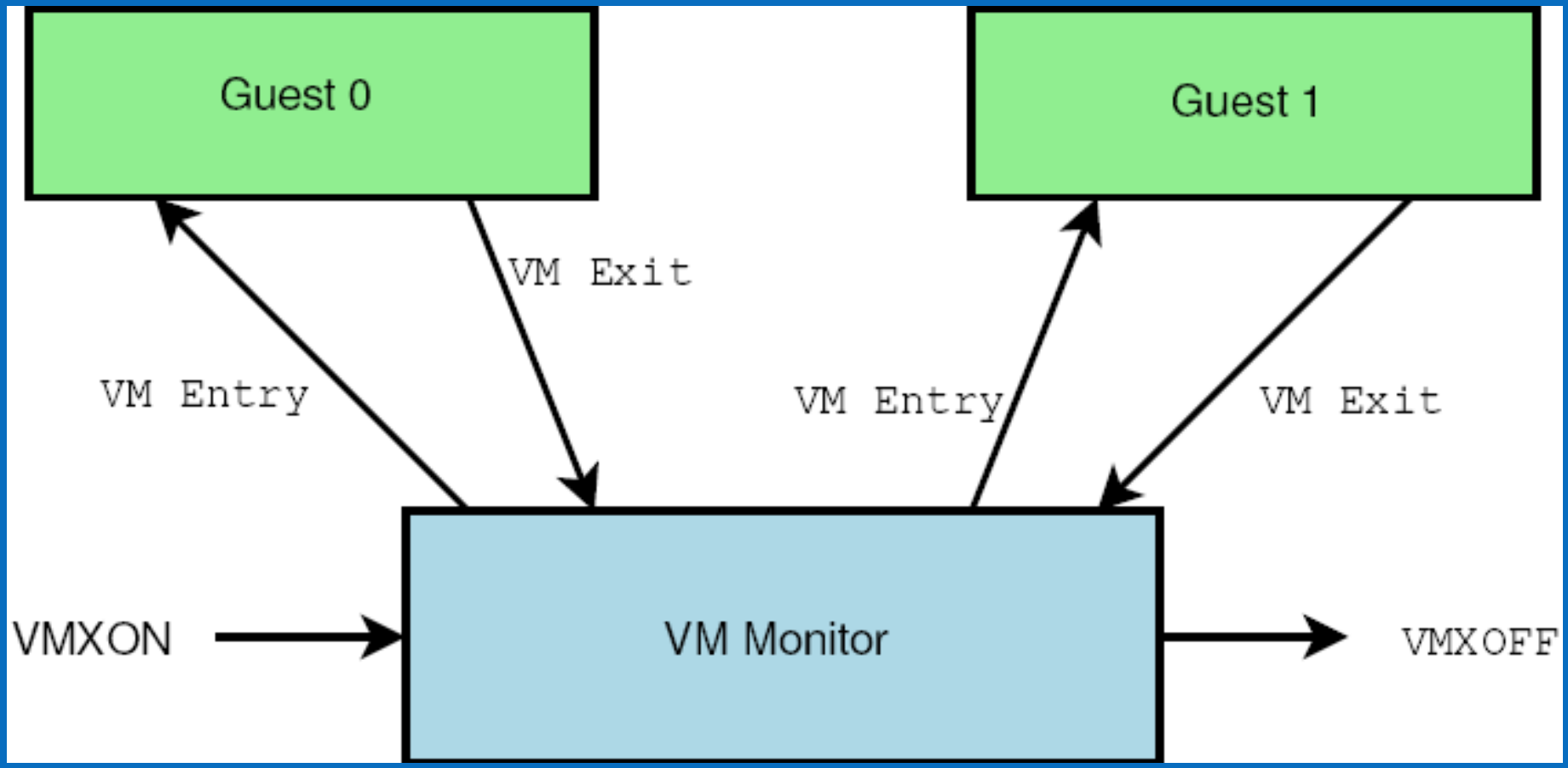
Alternatives for Linux Kernel Debugging



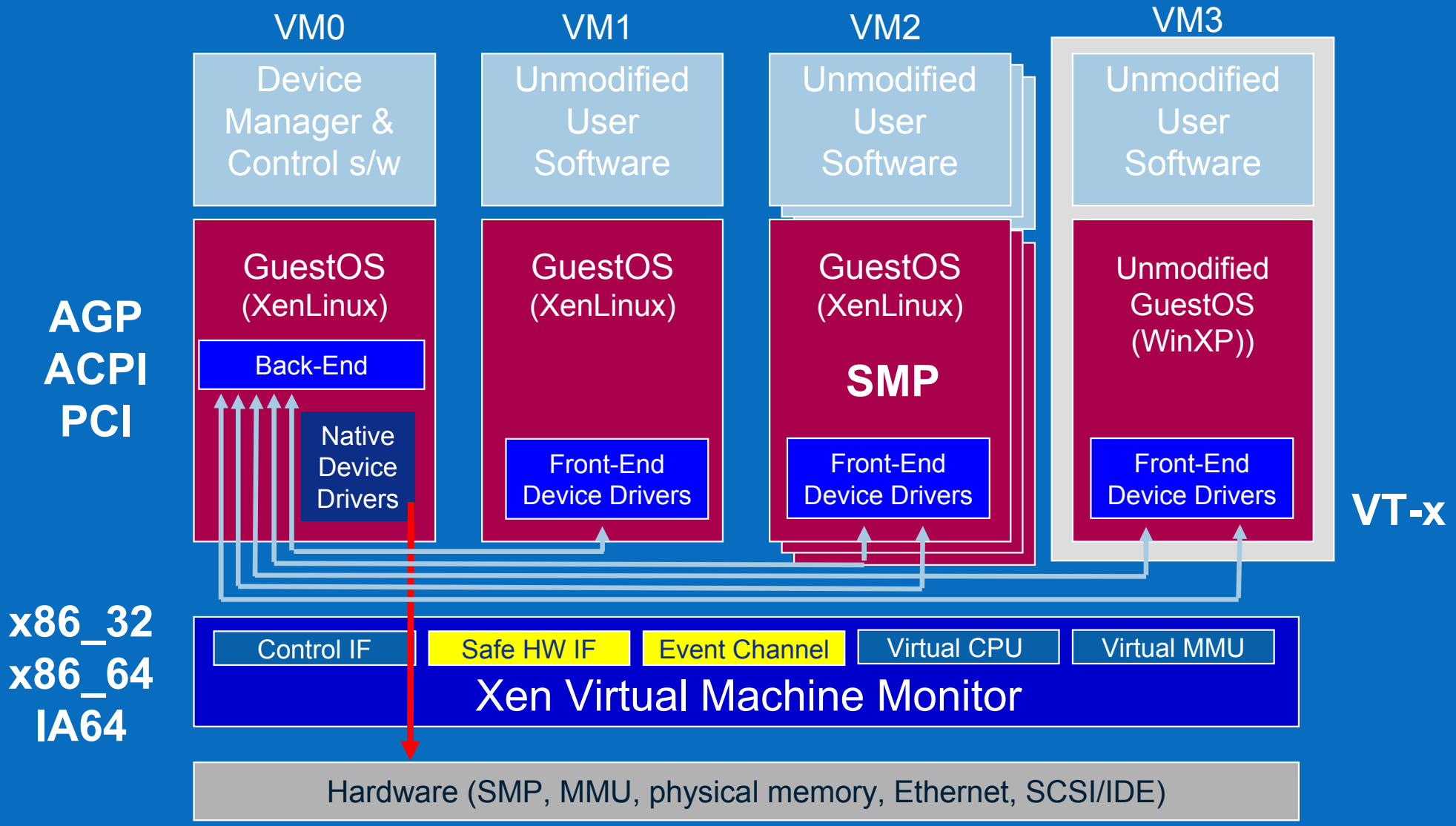
Helpful tools for Kernel debugging

- dmesg
- Magic Sysrq
- ksymoops
- LKCD

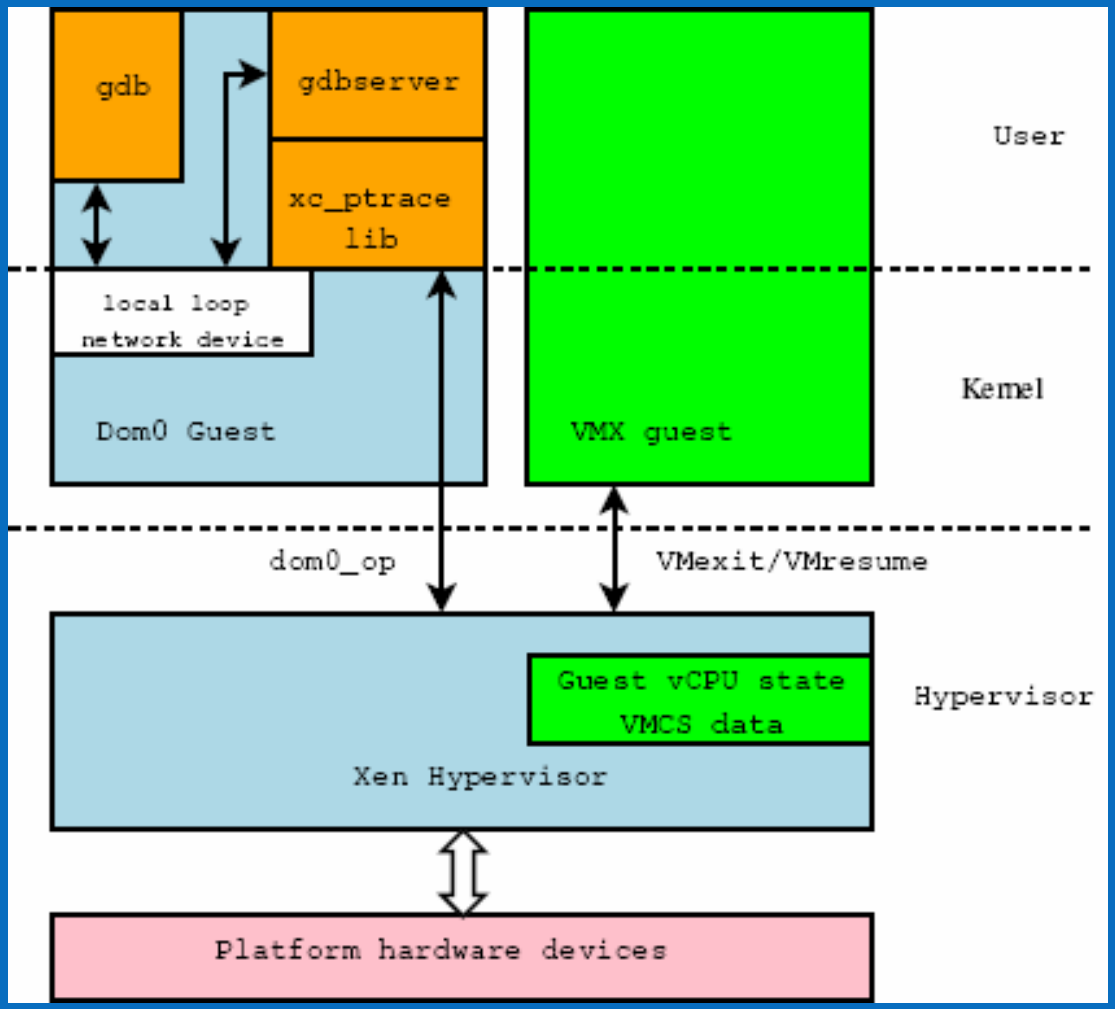
VMX Mode Transitions



Xen 3.0 Architecture



Architecture of debugging a unmodified guest under Xen with VT



Live debug Demo

System Configuration

- Hardware
  - Dell Pre-production Laptop with
    - Merom 2.0 GHz Processor with EM64T, Dual Core
    - 1GB DDR2 RAM
- Software
  - Hypervisor : Xen 3.0 x86_64
  - Host OS : Fedora Core 5 x86_64
  - Guest OS
    - Red Hat Enterprise Linux 3 AS Update 4 i386 edition (unmodified)
    - Windows XP i386 edition (Unmodified)
  - Debug tools
    - gdbserver-xen Compiled from Xen sources.
    - gdb from FC5

Legal Information

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- The opinions expressed in this presentation are those of the author and do not necessarily represent the position of the Intel Corporation.

Thanks !

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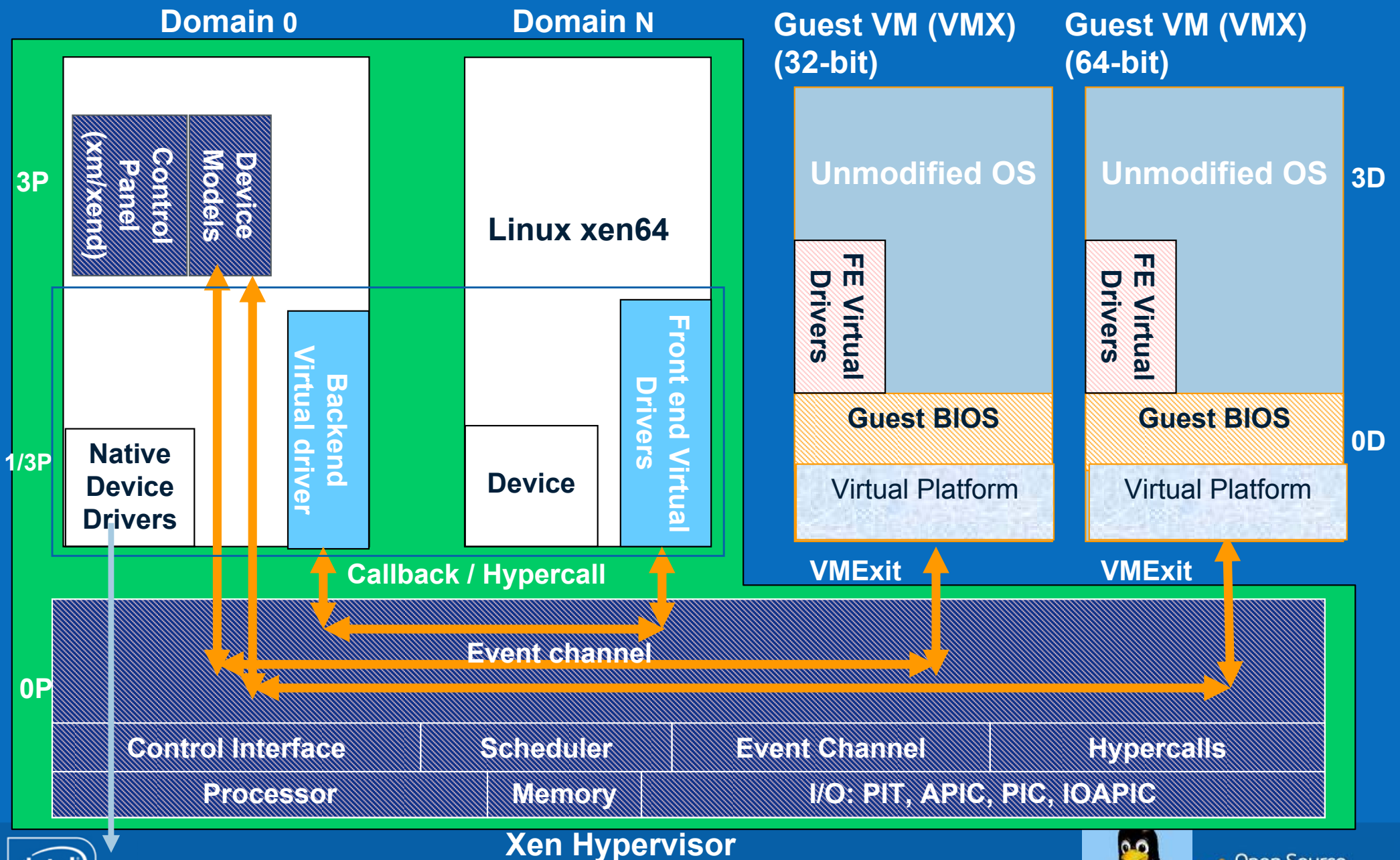
Backup Slides

Xen Architecture