Seminar Presentation

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Introduction

Outline

- Virtualization
- Xen
- kvm
- Comparison between Xen and kvm
- Power management in Virtualized Platform
- Conflict among different Power Management
- Coordination
- Unfairness to VMs
- Conclusion

Xen

- Open source Hypervisor released in 2003.
- Implemented virtualization through Paravirtualization.
- Used abstracted device instead of virtualized devices.
- Diveded functionality in Hypervisor and Dom0.

Xen Challenges

- Problems
- Implementation of Virtualization with low overhead of Virtualization.
- Emulation of privileged instruction in absence hardware support.
- tlb flush at each address space switch.

- Solution Approach
- Use of shadow page table to implement translation Guest Virtual to Host Physical Address instead of translating guest virtual address to guest physical address[Xen,2003].
- Paravirtualization : modification of code in host OS and guest OS.[Xen,2003]
- Simple approach to solve tlb flush: keep Xen in a fixed location.

kvm

- kvm needs hardware support to implement virtalization.
- Intel and AMD have added extensions to the x86 architecture to support virtualization.
- A new operating mode in processor: guest operating mode.
- Hardware state switch: h/w switches instruction pointer, control register and segment register.
- Exit reason reporting: Hardware reports the cause of switch so that software can take appropriate action[kvm,2007].

kvm Challenges

- Problems
- Implementation of Virtualization with low overhead of Virtualization.
- Emulation of privileged instruction in absence hardware support.
- tlb flush at each address space switch. To improve guest performance , the virtual mmu implementation enhanced to allow page tables to be chached across context switches. There is a problem that guest write
- Solution Approach
- Use of shadow page table to implement translation Guest Virtual to Host Physical Address instead of translating guest virtual address to guest physical address[Xen,2003].
- Paravirtualization : modification of code in host OS and guest OS.[Xen,2003]
- Simple approach to solve tlb

Comparison between Xen and kvm

- Xen
- Architecture: Xen uses Domain 0 to manage I/O operation, Network operations.
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Power Management in Virtualized Platform

Conflict among different Power Management

Coordination among different Power Management

Unfairness to VMs

Conclusion

References

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Thank You