VMM for Mobile Phones
Seehwan Yoo, Korea University
shyoo@os.korea.ac.kr

Motivation

Recent Diverse User Requirements for Complex applications (Reliability, user-friendliness)

Convergence Mobile Phone

Operating Systems Lab, Korea University (http://os.korea.ac.kr)

Research Goal

Develop a practical VMM for the mobile phone (ARM-based, realtime support, enhanced reliability, reduced porting effort)

Challenges & Methodologies

1. How to virtualize ARM-based devices?
   - Protect guest OS with limited privilege levels (using ARM domain protection)
   - Para-virtualize non-virtualizeable sensitive instructions

2. How the virtual machine architecture can enhance reliability in mobile phone device?
   - Investigate premature device driver operation
   - Present fail-over in the scenario

3. How the VMM architecture can reduce the porting effort in phone development?
   - Define Extensible Virtual Machine Interface
   - EVMI provides an abstract machine model

4. How to deal with real-time application?
   - Accurate time measurement
   - Inter-comm. mechanism between Hypervisor and guest OS scheduler
   - Low-latency interrupt handling (Guest-driven Interrupt handling)
   - Pre-processing at guest interrupt handler (for shared device)

5. How to handle power management issues in the VM architecture?
   - Power aware processor scheduling
   - Active power management at VM level considering SLA (Service Level Aggregation)