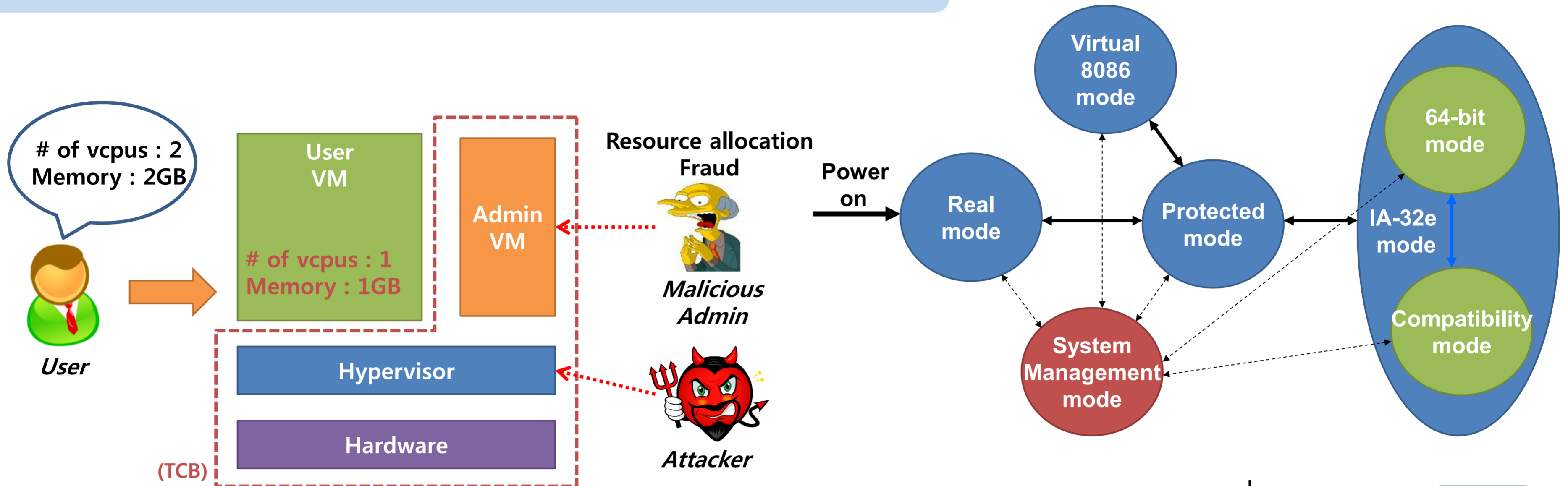


Towards Assurance of Availability in Virtualized Cloud System

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Introduction

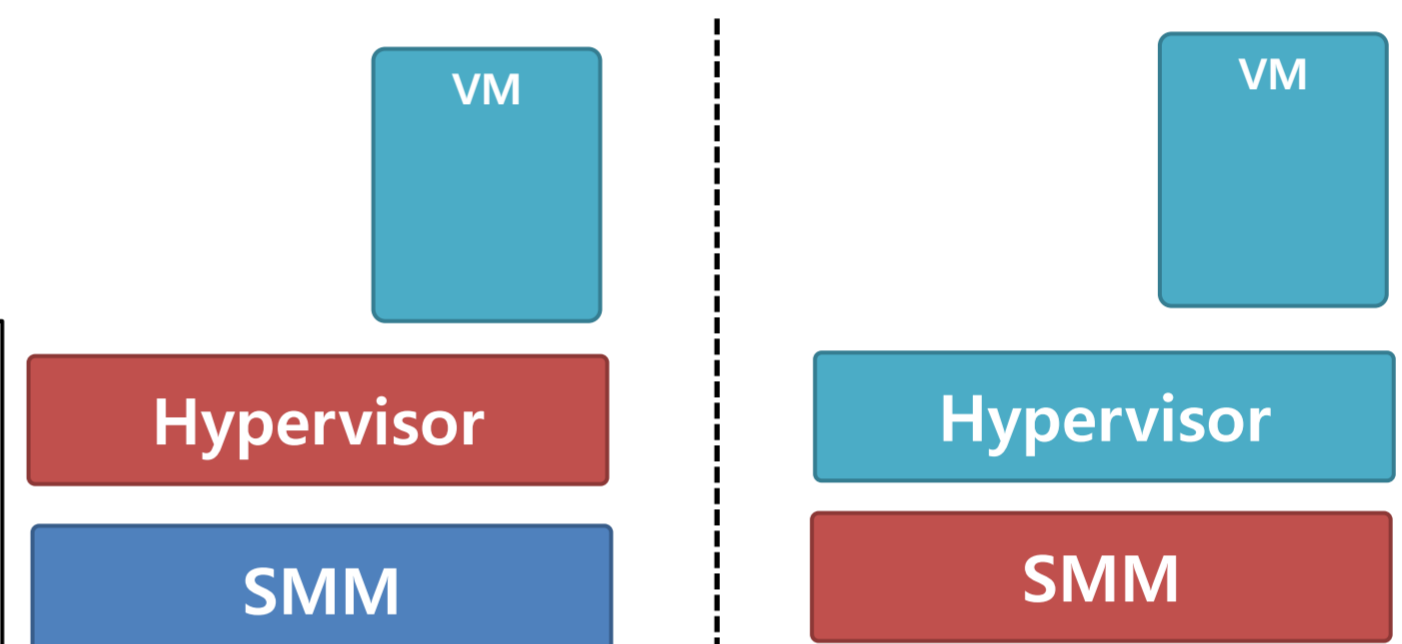
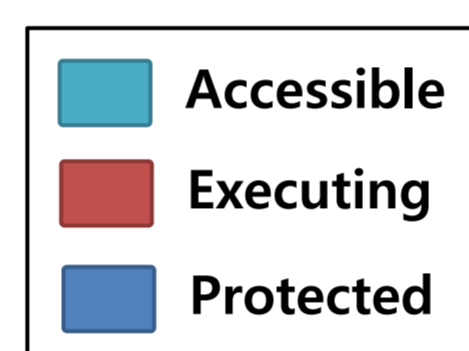


SLA (Service Level Agreement)

- Formally defined contract describing service quality.
- Processing, network Performance and parameter of capacity

Security issues in virtualized cloud system

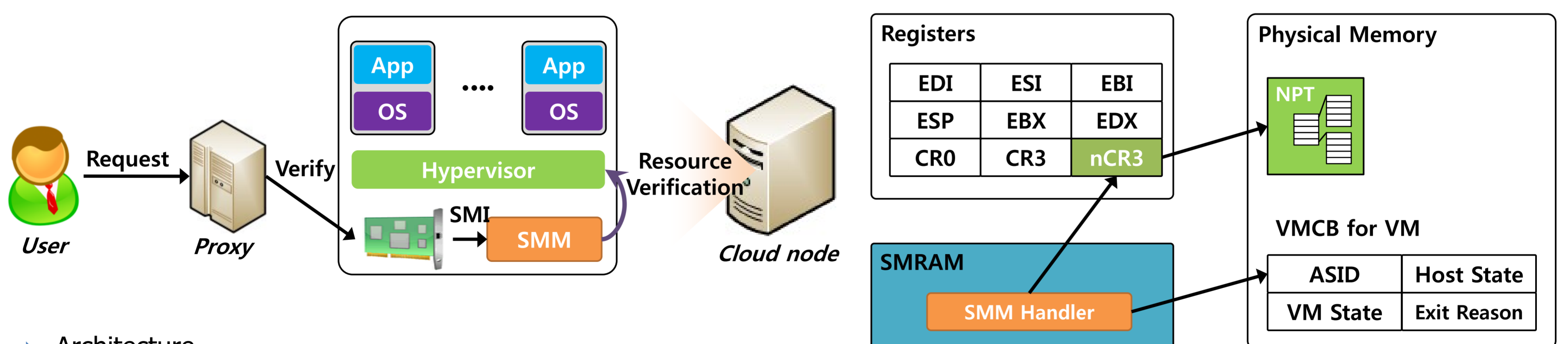
- Hypervisor can be compromised by attacker
- Malicious admin can abuse allocated resources to VM
- Allocated resources of VM cannot be guaranteed
- We need a higher privileged layer than hypervisor



SMM (System Management Mode)

- Special mode supported by x86 architecture
- x86 processor can enter into SMM by SMI (System Management Interrupt)
- SMM handler loaded into SMRAM and process SMI
- SMRAM is accessible by only SMM handler
- SMM handler has higher privilege level than hypervisor

Design Overview



Architecture

- Proxy verifies resource allocation behalf of cloud user
- Network interface wakes SMM handler by issuing SMI
- SMM handler verifies allocated resources of VMs

Verification of Resources

- Current hypervisor relies on HVM (Hardware-assisted VM)
- SMM handler can track VM information
- When VM scheduled, SMM handler can know that by searching the HVM information on physical register or memory.
- Tracing NPT of VM, SMM handler verifies amount of physical memory allocated to VM

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