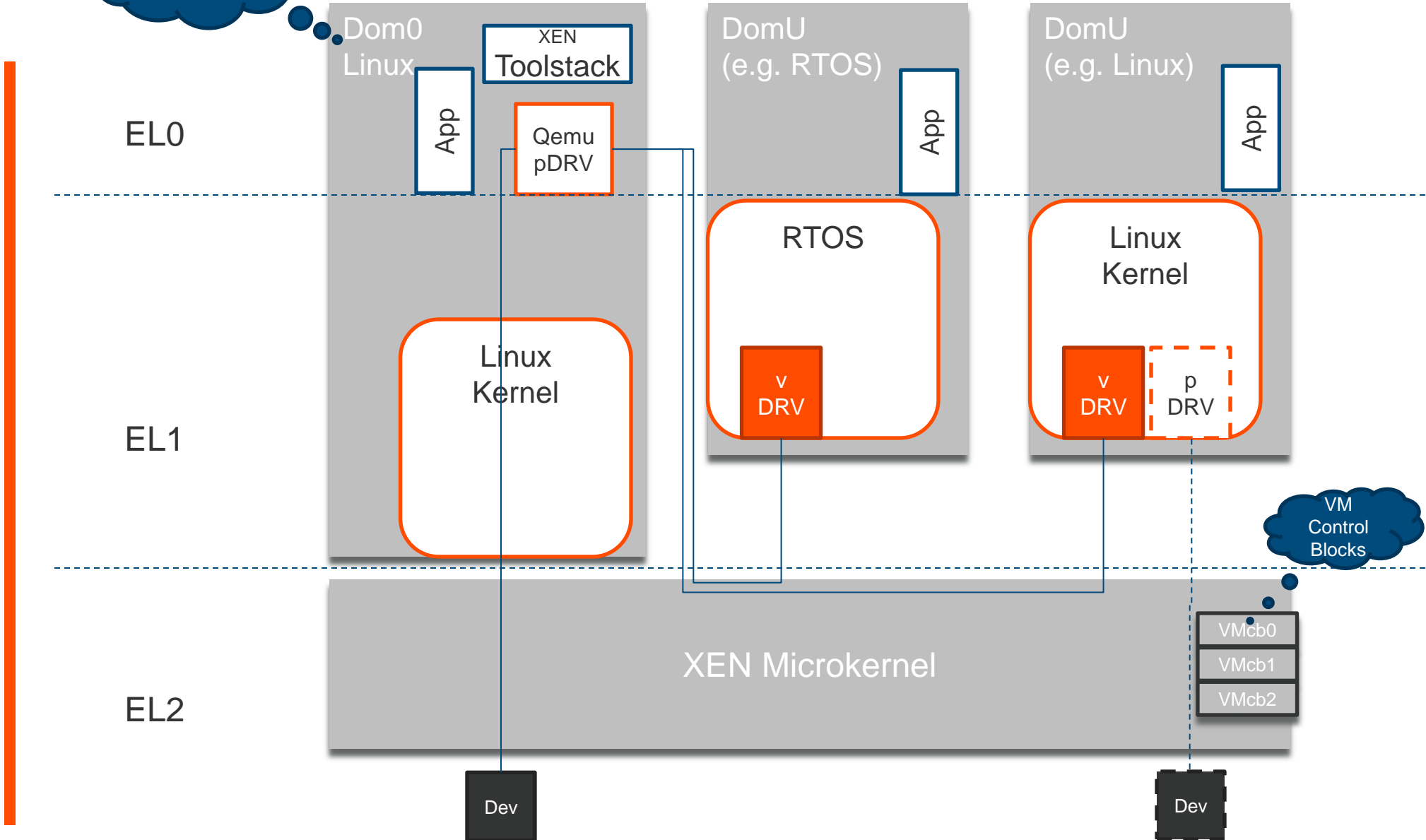


Hypervisor Design(s)

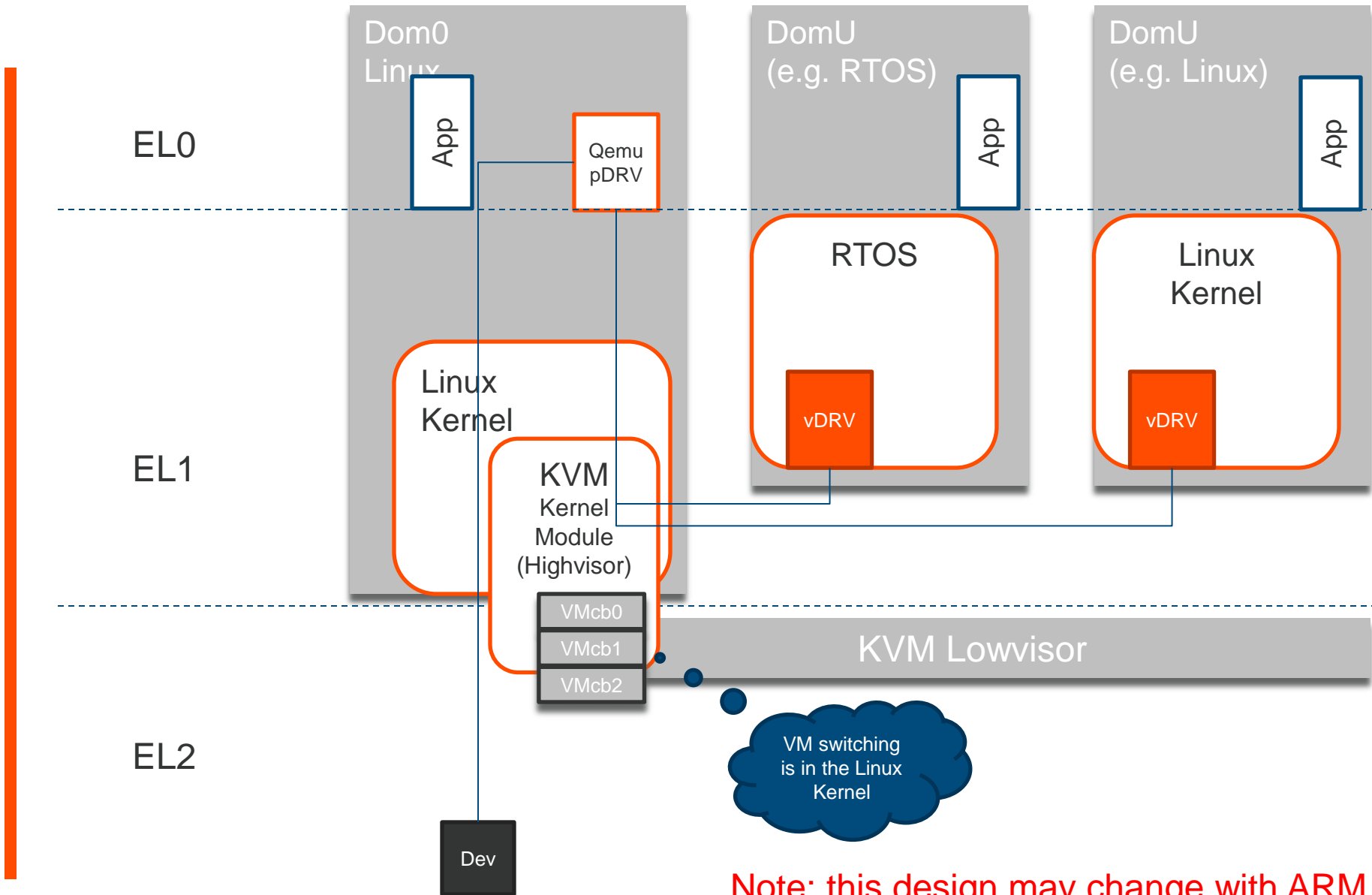
2018-04-18 GENIVI AMM (Munich)

Dr. Ralph Sasse, Lead Solution Engineer

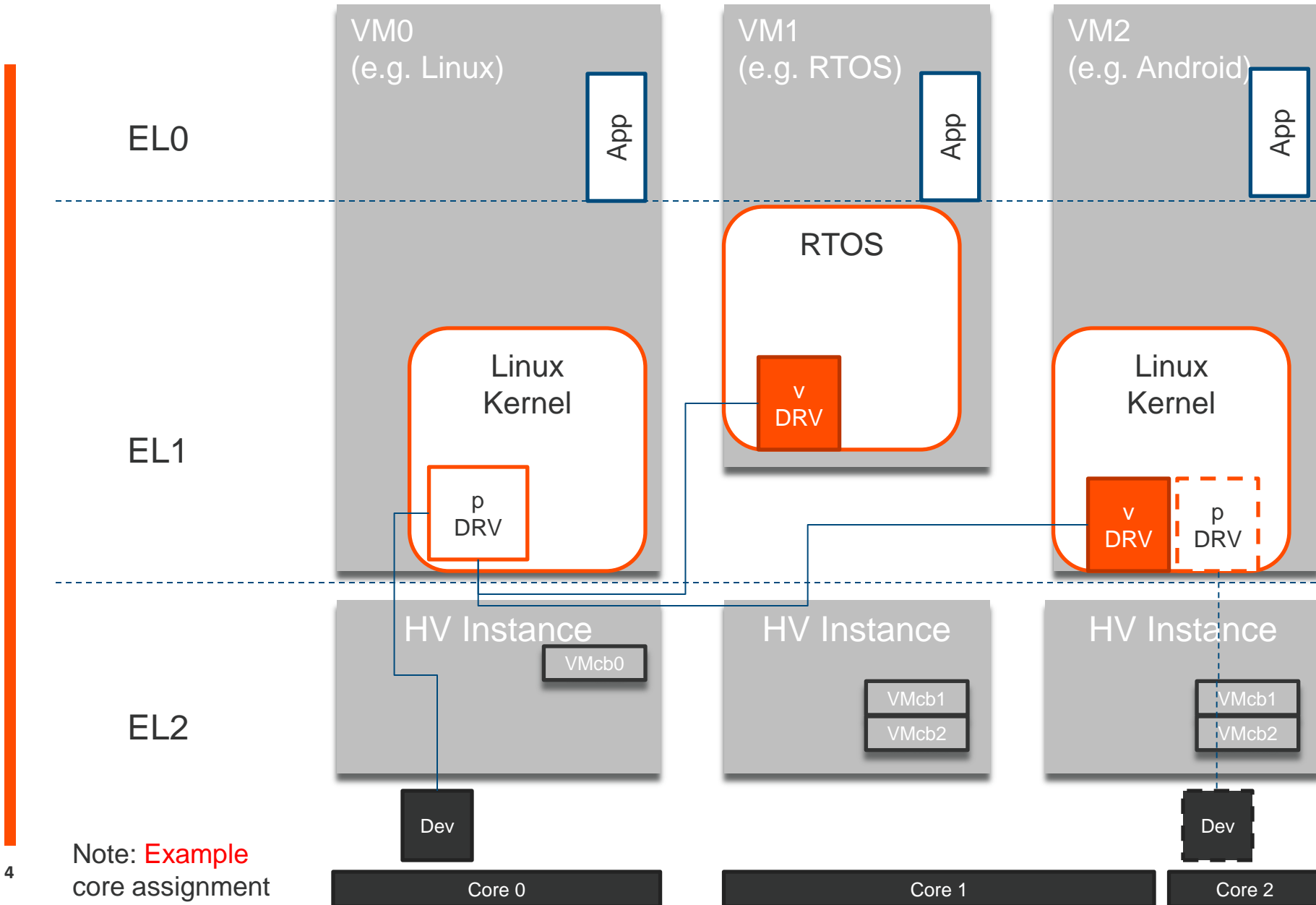
Typically Linux



KVM (on ARM)

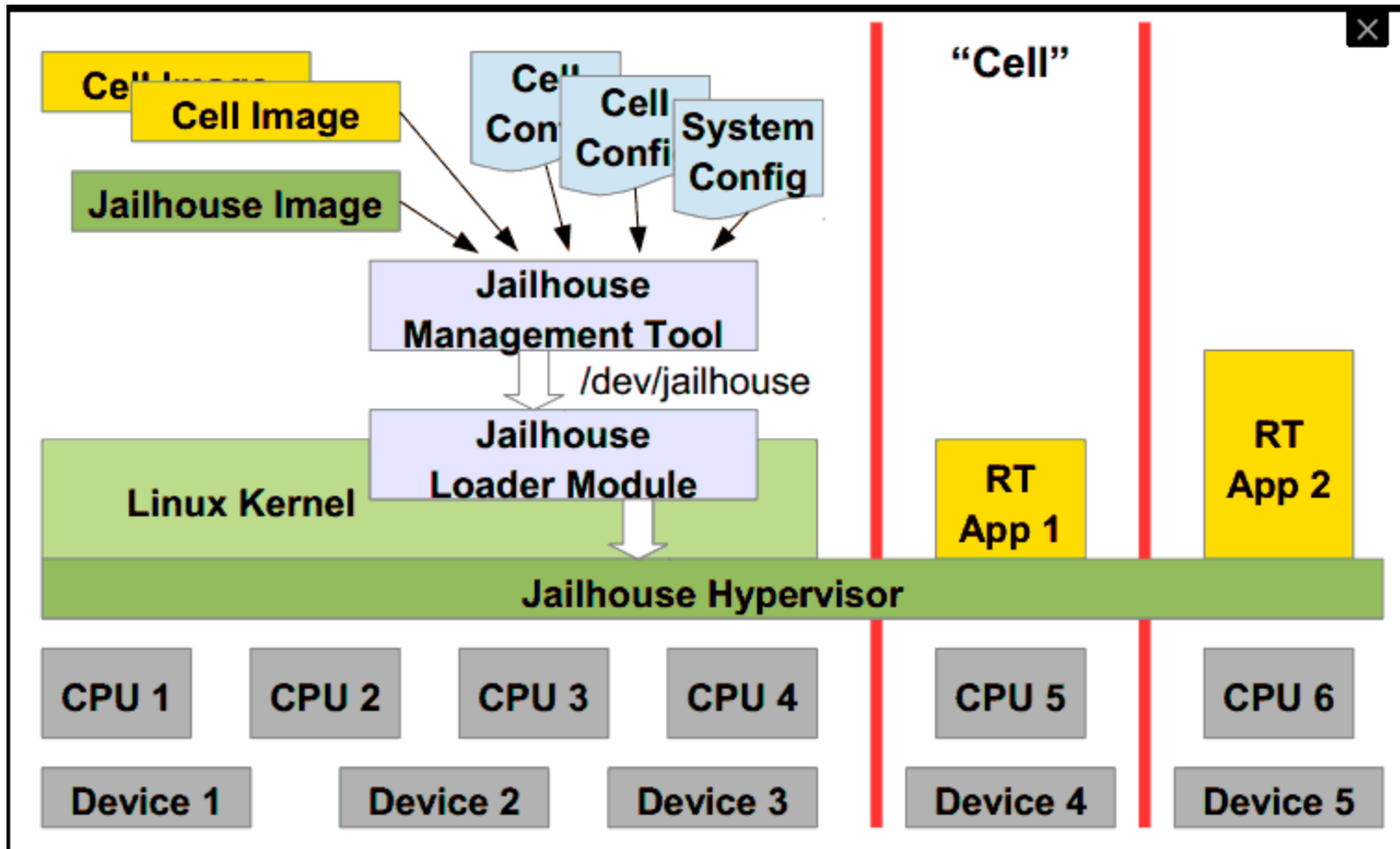


Note: this design may change with ARM v8.3



No core sharing (cores are dedicated to VMs)

Linux loads Jailhouse Hypervisor



Master VM vs. Equal VMs

- One VM (Linux or RTOS) is master (e.g. Xen, KVM)
- All VMs are equal

Static vs. Dynamic Configuration

- Statically configured → offline check possible
- At run-time configured → more flexibility, but more difficult to validate, ↗ API

Core sharing vs. Dedicated Cores

- Core sharing requires a scheduler in the Hypervisor

Small vs. functionality

- Small is easy to qualify, but restrictions in usage apply (less flexible)

HW Virtualization Extension (EL2) vs. Para-virtualization

- Para-virtualization means ↗ Maintenance Effort and ↘ Performance

MMU vs. MPU

- Intended for different Use Cases
 - Small vs. huge SoC
 - RTOS vs. GPOS

Possible VM Allocation Patterns

1 core == 1 VM

Specialized cores (e.g. I/O)

N cores == 1 VM → aka SMP; distribution requires inter-core communication

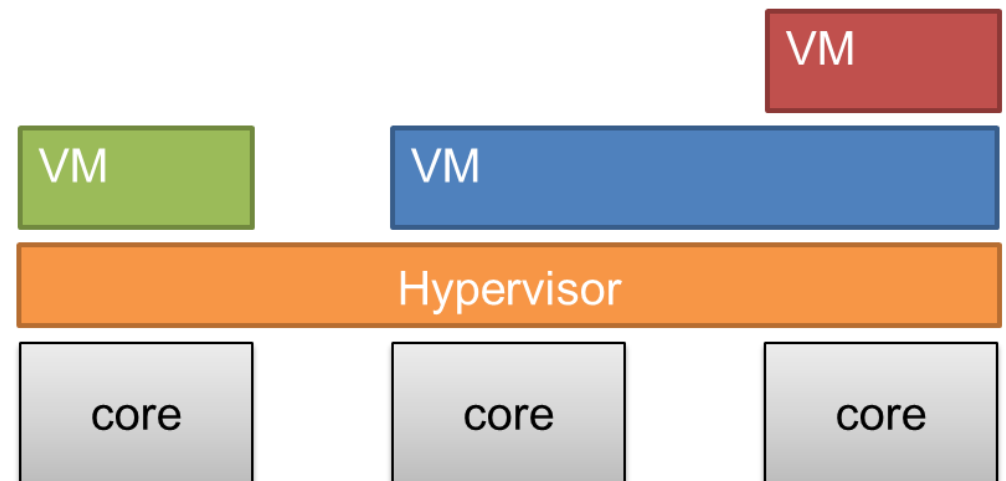
Shared cores → requires VM scheduling

1 VM == 1 supplier

1 VM == 1 functionality

1 VM == 1 criticality (ASIL) → reduced effort for qualification

1 VM == 1 timing (real-time/best effort)





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