ACRN Open Source Roadmap in 2020

*Feature and dates for reference only and subject to changes without notice*
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**Q1’20**
- **v1.5**
  - CPU Sharing
- **v1.6**
  - Power management for Sharing and Hybrid Mode
  - S5/reset for sharing mode with RTVM
- **v1.6.1**
  - S5 for hybrid mode
- **v1.7**
  - Libvirt Basic Support
  - SR-IOV (Ethernet)

**Q2’20**
- **v2.0**
  - GVT-d for Windows guest
  - PCI bridge and config emulation for PT Device in HV
- **v2.1**
  - Offline configuration tool

**Q3’20**
- **v2.2**
  - PCIe 4.0
  - ACRN over QEMU/KVM
  - ACPI customization in HV
  - CPU ISA – AIA, CLWB
  - TCC feature – ART, Split lock

**Q4’20**
- **v2.3**
  - Inter-RTVM communication (DM-land, HV-land) (Notification based on Interrupt)
  - Pre-launched RTVM: Preempt-RT Linux
  - Security – TME, ROP CET
  - TCC feature – PTM, pseudo-locking, MBA, device post interrupt
  - Secure VM

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2020 ACRN Roadmap Feature Description

CPU sharing - C/P state in HV: Support the CPU C/P state in hypervisors after CPU sharing is enabled.
S5/reset for sharing mode with RTVM: Support power transition of shutdown/reset for system or per-VM level under the sharing mode with RTVM scenario.
Libvirt basic support: ACRN and Device Model support for basic libvirt operations for VM management such as VM start/stop.
GVT-d for Windows Guest: GPU passthrough (GVT-d) can be used to assign GPU to dedicated Windows Guest. The local display will be assigned to Windows Guest accordingly.
Libvirt basic support: offline configuration tool for ACRN hypervisor that covers configuration items such as guest VM memory, CPU cores, HW allocation, etc.
PCI bridge and config Emulation for PT Device in HV: Support PCI bridge and config space emulation for passthrough devices in the hypervisor.
Offline configuration tool: offline configuration tool for ACRN hypervisor that covers configuration items such as guest VM memory, CPU cores, HW allocation, etc.

CPU sharing - priority/credit-based scheduler: Support/improve the CPU sharing scheduler based on priority/credit.
S5 for hybrid mode: Support power transition of shutdown for system or per-VM level under the hybrid mode scenario (e.g. pre-launched Safety VM + Service VM + HMI + RTVM).
PCle 4.0: Peripheral Component Interconnect Express 4.0 Standard.
ACRN over QEMU/KVM: ACRN as a nested hypervisor on top of QEMU/KVM with basic functionality.
ACPI customization in HV: Support a customized ACPI table for pre-launched and Service VMs.
CPU ISA - AIA, CLWB: CPU Instruction Set Architecture (ISA), including AIA (Accelerator Interfacing Architecture), CLWB (Cache Line Write Back).
TCC (Time Coordinated Computing) features: ART (Always Running Timer), Split Lock.

Inter-VM communication (DM-land, HV-land): Provide a high-bandwidth, low-latency communication between VMs.
Pre-Launched RTVM (Preempt-RT): Pre-launch Preempt-RT Linux as RTVM.
Security Feature: TME (Total Memory Encryption), ROP CET (Control-flow Enforcement Technology that blocks Return Oriented Programming attacks).

Inter-RTVM communication (Notification based on Interrupt): Provide a high-bandwidth, low-latency inter-VM communication between RTVM.
TCC (Time Coordinated Computing) features: pseudo-locking, PTM (Precision Time Measurement), MBA (Memory Bandwidth Allocation), Device Post Interrupt
Secure VM: Provide an isolated secure execution environment as a general TEE or for IP protection.