

ACRN

ACRN Open Source Roadmap 2020

March 2020

ACRN Open Source Roadmap in 2020

Development



*Feature and dates for reference only and subject to change without notices

	Q4'19	Q1'20	Q2'20	Q3'20	Q4'20
	V1.4	V1.5	V1.6	V2.0	
ACRN Feature Development	CPU Sharing			ACRN Next Evolution	
	GVT-d for Windows guest				
	Offline configuration tool				
	DM in HV (PCI bridge and CFG space)				
	Power management for Sharing and Hybrid Mode				
	Basic Libvirt support				
	SR-IOV (Ethernet)				
	Multiple RTVM				
	Inter-RTVM communication				

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Hypervisor	<ul style="list-style-type: none"> Zephyr as Safety OS CPU sharing Kata Containers managed from within the Service VM (via Docker) Kata Containers managed from within the Service VM (via Kubernetes) 	<ul style="list-style-type: none"> Service VM: Yocto or Ubuntu Offline configuration tool S5/reset for sharing mode with RTVM 	<ul style="list-style-type: none"> CPU sharing - C/P state support CPU sharing - priority/credit-based scheduler Service VM boot from virtual boot loader S5 for hybrid mode CPU ISA - AIA, CLWB, CLDEMOTTE SHA-256/AES-256 TCC feature - ART, PTM, split lock, pseudo-locking Security - TME (Total Memory Encryption), ROP CET 	<ul style="list-style-type: none"> Multiple RTVMs Inter-RTVM communication 	<ul style="list-style-type: none"> 5-Level Paging CPU ISA - VNNI, VPOPCNT, VPMADD52 TCC feature - MBA, MBM, CMT, device post interrupt Security - UMIP
I/O virtualization		<ul style="list-style-type: none"> GVT-d for Windows guest SR-IOV for Ethernet Libvirt basic support Device Model in HV - PCI bridge & CFG space 	<ul style="list-style-type: none"> PCIe 4.0 ACPI customization in HV 		<ul style="list-style-type: none"> PCIe 5.0

For more details on these features, see the next slide.

2020 ACRN Roadmap Feature Description



Zephyr as Safety OS: Zephyr will be used as a safety OS which will perform the system functional safety-related tasks.

CPU sharing: Enable a scheduler in the hypervisor to allow Service and User VMs to share physical CPUs

Kata Containers managed from within the Service VM (via Docker): Make Kata/ACRN work with Docker.

Kata Containers managed from within the Service VM (via Kubernetes): Make Kata/ACRN work with Kubernetes.

Service VM: Yocto or Ubuntu: Enable Yocto Project or Ubuntu as the Service VM Operating System (OS).

Offline configuration tool: offline configuration tool for ACRN hypervisor that covers configuration items such as guest VM memory, CPU cores, HW allocation, etc.

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.

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.

SR-IOV for Ethernet: Support Single Root I/O Virtualization (SR-IOV) for Ethernet.

Libvirt basic support: ACRN and Device Model support for basic libvirt operations for VM management such as VM start/stop.

Device Model in HV - PCI bridge & CFG space for PTdev: Support PCI bridge and config space emulation for Pass-thru devices in the hypervisor.

CPU sharing - C/P state in HV: Support the CPU C/P state in hypervisors after CPU sharing is enabled.

CPU sharing - priority/credit-based scheduler: Support/improve the CPU sharing scheduler based on priority/credit.

Service VM boot from virtual boot loader: Support Service VM boot from a virtual boot loader (e.g. OVMF).

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).

CPU ISA - AIA, CLWB, CLDEMOTTE: CPU Instruction Set Architecture (ISA), including AIA, CLWB, CLDEMOTTE.

SHA-256/AES-256: SHA (Secure Hash Algorithm)-256 bits and AES (Advanced Encryption-Standard)-256 bits.

TCC features: ART, PTM, split lock, pseudo-locking.

Security Feature: TME (Total Memory Encryption) and ROP CET(Control-flow Enforcement Technology that blocks Return Oriented Programming attacks).

PCIe 4.0: Peripheral Component Interconnect Express 4.0 Standard.

ACPI customization in HV: Support a customized ACPI table for pre-launched and service VMs.

Multiple RTVM: Support more than one RTVM in a system.

Inter-RTVM communication: Provide a high-bandwidth, low-latency inter-VM communication between RTVMs.

5-Level Paging: To support up to 4PB of physical memory.

CPU ISA -VNNI, VPOPCNT, VPMADD52: CPU Instruction Set Architecture (ISA), including VNNI, VPOPCNT, VPMADD52.

TCC features: MBA (Memory Bandwidth Allocation), MBM (Memory Bandwidth Monitoring), CMT (Cache Monitoring Technology), device post interrupt.

Security Feature: UMIP (User-Mode Instruction Prevention).

PCIe 5.0: Peripheral Component Interconnect Express 5.0 Standard.