Linaro roadmap highlights

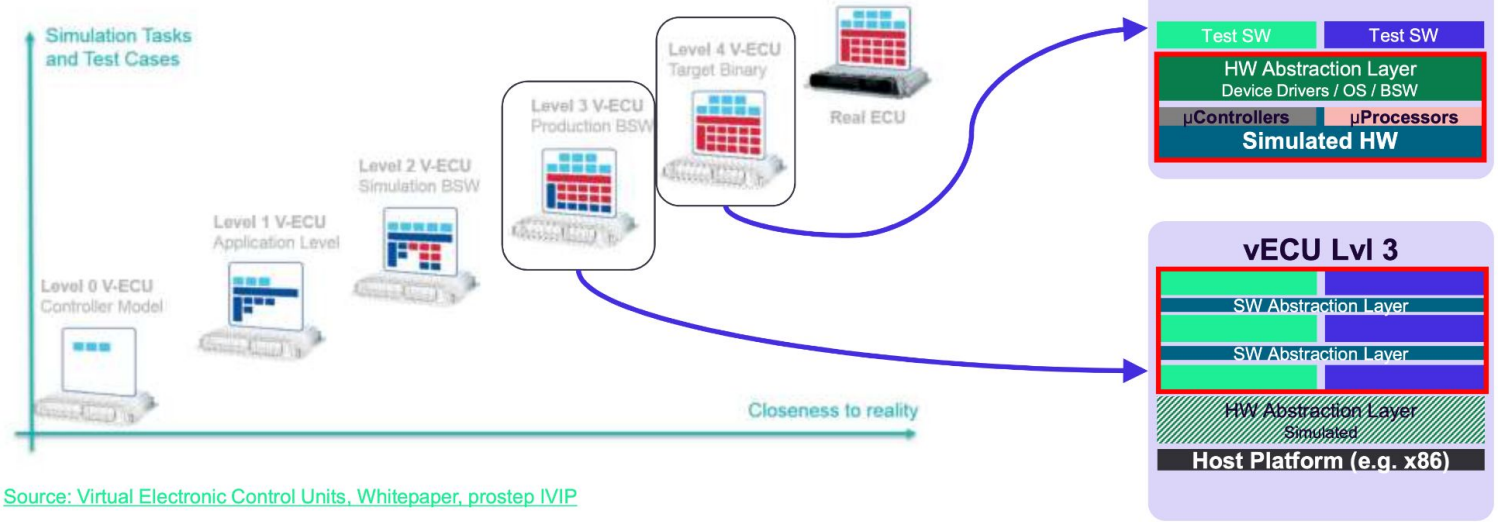
AGL Virt-EG March 2nd

Automotive infrastructure software activities

Theme	LEDGE Trusted Substrate	LEDGE/ Reference Platform	LEDGE/ Heterogeneous Platform	Automotive	Other Linaro groups or projects
SOAFEE Implementation	- U-Boot+ACPI for SystemReady-ES - UEFI SecureBoot of Dom0 - UEFI SecureBoot of DomUs	- DOM0 template (Arm) - RunX kernel template - Parsec signed containers - AppArmor | SELinux - Parsec enabled IMA - Wireless cleanups	- OCI evolution for accelerators - Sharing devices with OCI (gpu) with 3rd party containers - (see Simulation)	- Xen on SystemReady . device init and assignment . hypervisor interfaces - Autoware containers	**Linaro IoT and Edge (LITE)** - MCU Boot/FF-M OTA
RealTime technologies And deployment		- Low latency PipeWire over TSN - FDO (Wifi auto admission)	- RTOS on cortex A/M - RTOS payloads on Xen - virtio services between A+R/M		**STRATOS** (Linaro Virtualization project) -virtualized TSN
Safety and Dependable technologies	- WP.29 cybersecurity compliance . Hardening (anti-glitching…) - ISO 24089 compliance (auditability…) - OTA ruggedized E2E CI . PSA level 3 readiness . PSA FWU - Freedom of interference from secure firmware	- WP.29 cybersecurity compliance . Hardening (anti-glitching…)	- WP.29 cybersecurity compliance . Xen hardening (anti-glitching…)		**LITE** - PSA FWU for MCU
Multitenancy IP protection	- TEE mediator - Confidential AI			GSA multi tenancy white paper (Linaro, AWS, Msft, Rambus, NXP, Arm)	**LITE** - Confidential AI
Simulation			vECU level 4 (see next slide) QEMU framework	Nested virtualization optimizations	**QEMU** - heterogeneous platform support

Virtual Development Environments

Definition of Abstraction Levels and Nomenclature



Source: Virtual Electronic Control Units, Whitepaper, prostep IVIP

ECU	Electronic Control Unit
V-ECU	Virtual ECU
BSW	Base Software

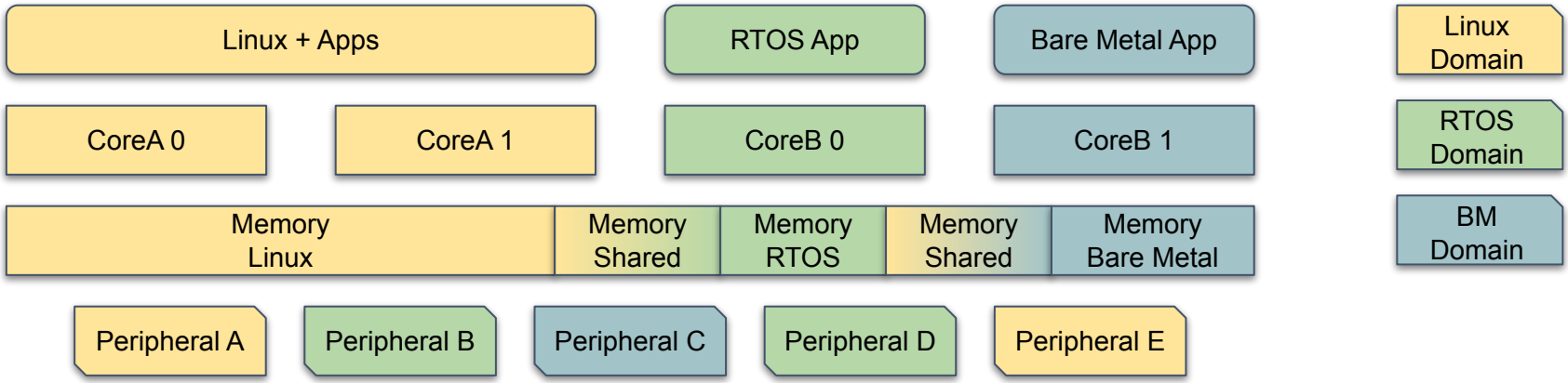
OpenAMP: “**Open A**symmetric **M**ulti-**P**rocessing” Project

Runtime coexistence and collaboration
Runtime hardware resource assignment
Resource sharing and IPC between runtimes
Control mechanisms to start and stop runtimes
Typical system: Linux + RTOS on one system-on-chip

www.openampproject.org.

OpenAMP Mission

OpenAMP provides standards, runtime libraries and tooling built on top of existing open source projects to simplify runtime collaboration



Work now to April

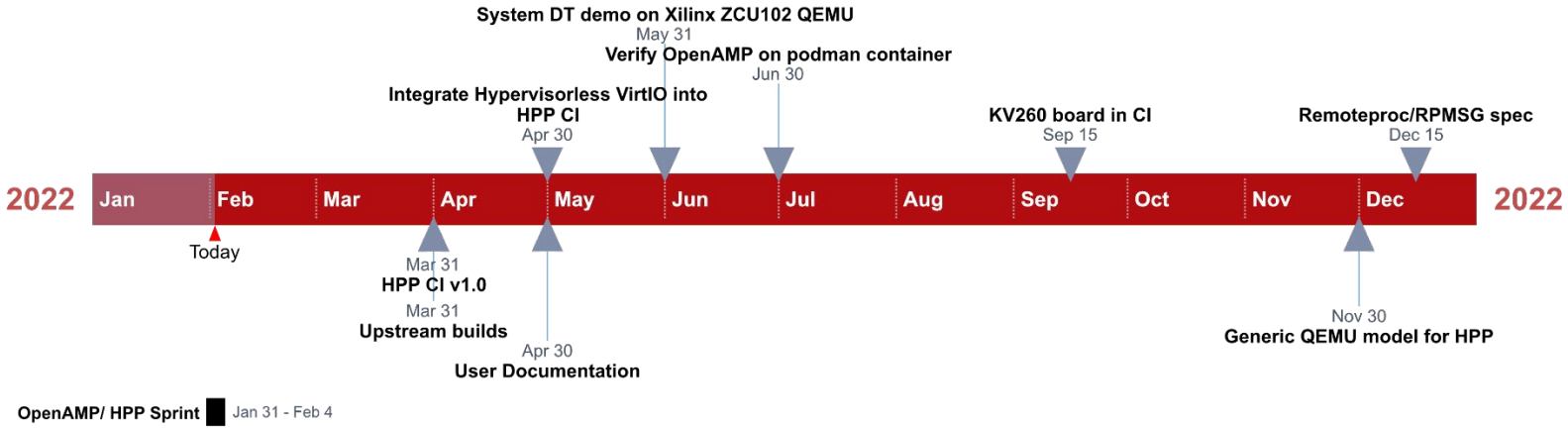
- Upstream Build for OpenAMP
  - Build OpenAMP for upstream kernel or staging kernel
  - Build Upstream libopenamp and libmetal
- CI for OpenAMP V1.0
  - Build full system on each PR (libs) or Patch series (kernel)
  - Trigger QEMU or board test runs
- Integrate hypervisorless virtio into OpenAMP CI
  - Build and test for each PR or commit
  - for Zephyr fork and kvmtool fork
- Demonstrate System Devicetree on Xilinx QEMU
- User Documentation and Demo
- Supported Boards
  - STMP157c-DK2 (works on STMP157f-DK2 also)
  - Xilinx ZCU102 in Xilinx fork of QEMU

Aligned work for the rest of 2022

- Verify functionality in target container runtime
- Xilinx KV260 on boarding in CI
  - ZynqMP quad A53 + dual R5, ~$200
  - Target for Trusted Substrate as well
  - Supports Xen and RT Linux
  - Same SOC as ZCU102 used in QEMU and other projects
- rpmsg character driver improvements & rpmsg tty
  - Currently on v9 and v10 of each patch series
- Sphinx based documentation
  - Official remoteproc / rpmsg spec
- Generic HPP QEMU machine
  - default : 4x A53 + 2x M3 + 2x R5
  - command line options to change to M33 or M55
  - MMR based run/stop per core
  - Mailbox IPC HW
  - Selectable boot core

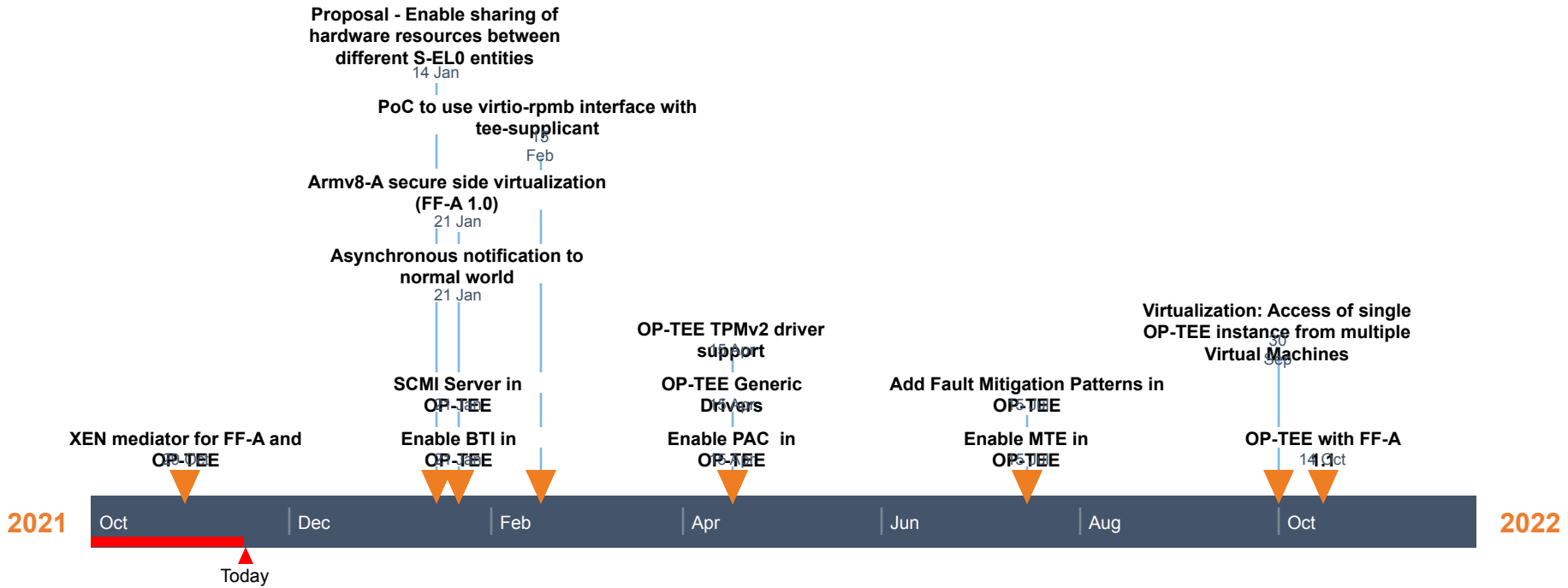
HPP roadmap

https://linaro.atlassian.net/wiki/spaces/HPP/overview



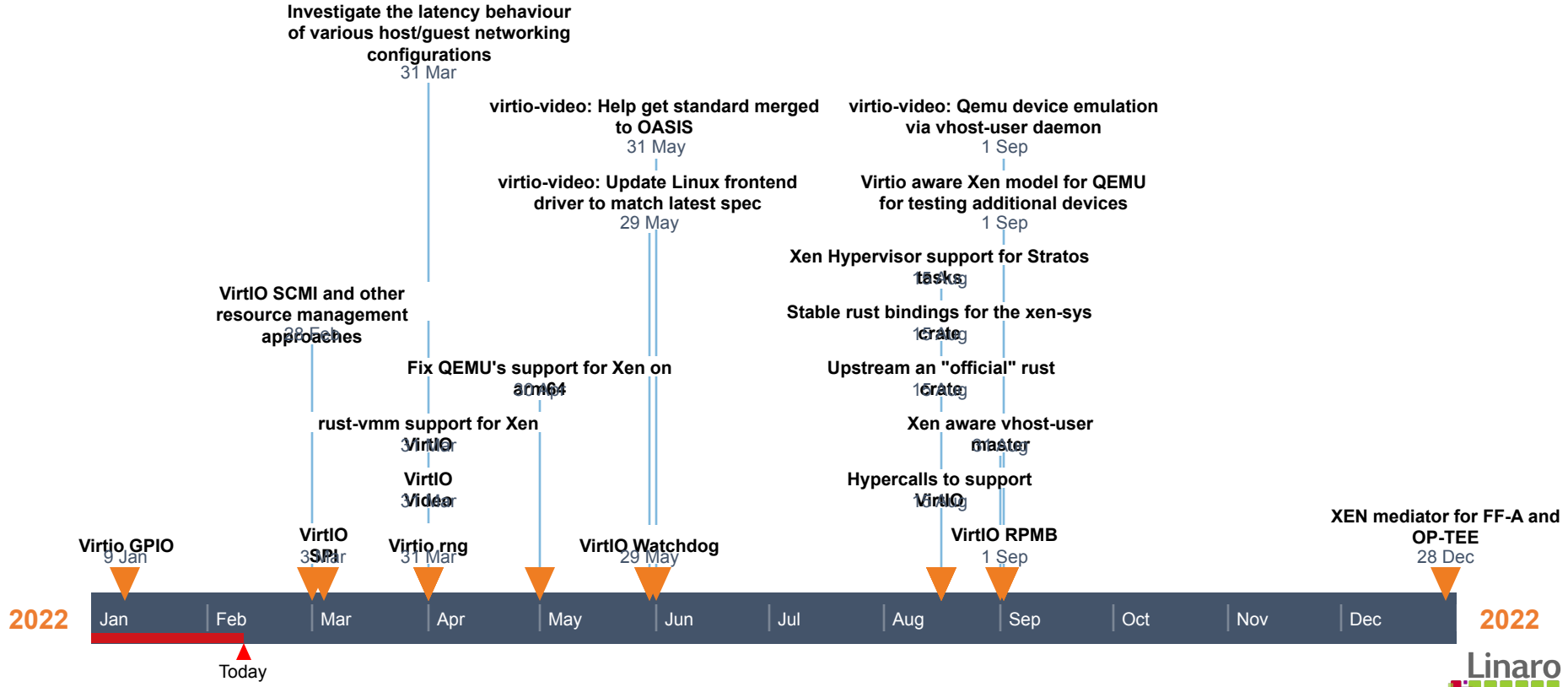
OP-TEE roadmap

https://linaro.atlassian.net/wiki/spaces/LOC/overview



Stratos roadmap

https://linaro.atlassian.net/wiki/spaces/STR/overview



Linaro

Device sharing initiative

Step 1: clearly define problem space

- Hypervisor providers: Xen, VMWare, Windriver, Siemens, Elektrobit, Microsoft, OpenSynergy
- Full fledge VM or hardware isolated containers (RunX/Kata containers)
- Linaro & Arm experts
- Linaro members

Step 2: define what we want to do

- Linaro members

Thank you