Support VirtIO in AGL

Members:

*Note: If anyone would like drop from this member list, please remove your name or alternatively contact Jerry, Jiancong Zhao

Company	Member
Panasonic	Jerry, Jiancong Zhao (Current EG Lead)
Linux Foundation	Walt Miner Jan-Simon Moeller
ARM	Matt Spencer
Carmeq	Laurent Cremmer Mark Silberberger Nicolas Blazevic
Tuxera	Joel Catala Eva Rio
Linaro	Francois Ozog Mike Holmes Leonardo Garcia
OpenSynergy	Mikhail Golubev
Konsulko	Scott Murray
ADIT	Kenji Hosokawa Naoko Tanibata Eugen Friedrich
AGL Google Summer of Code (GSoC) 2020 student	Parth Dode Jakub Luzny
Collabora	Daniel Stone Marius Vlad
Renesas	Stephen Lawrence

Role of AGL in Virtualization Standardization

- OASIS(VirtIO 1.1): general standard on virtio specification
- GENIVI - AVPS: automotive-centered specification
- AGL: coding & implementation for real automotive use (more close to real product)

Virtualization EG Roadmap in 2020

- Support VirtIO in AGL
    - Multi-VM VirtIO PoC
    - AGL Virtualization White Paper Update
    - VirtIO Frontend Integration in AGL

*Note: Anyone would like to propose other activities for EG, please write down here and state your name beside.

Sub-activities

Multi-VM VirtIO PoC

- Purpose: To show the features and evaluate performance for VirtIO automotive use
- Define common specification, architecture and evaluation items for the EG PoC
    - Discussion on VirtIO Devices to be used in different automotive use cases (IVI, IC, Telematics)

- what virtual devices should be used
- how the virtual devices should be used (pass-through/front-end/back-end)
- Implementation
  - HW:
    - Emulator: QEMU
    - SoC: TBD
      - Options:
        - Renesas M3/H3 (H3 is hard to get for some members)
        - Qualcomm Board
        - QEMU x86
        - other companies' SoC
    - HW: TBD
      - Options:
        - Renesas Reference Board
        - LEGO
        - ...
  - SW:
    - Hypervisor: Any OSS/commercial hypervisor that supports VirtIO
    - Front-end Device Driver: Open Source
    - Back-end Device Driver: Proprietary for most of the case (QEMU has open source backend)
  - How:
    - idea: break down to several PoCs with incremental features
      - step 1: common/basic feature only (only 1 guest VM, only simple virtio devices such as virtio-blk, virtio-net)
      - step 2: more advanced feature
  - Who:
    - **option 1: voluntary implementation from members (PoC in the name of the company/community) option 1 selected**
      - Volunteer 1: OpenSynergy (Mikhail Golubev)
        - Hardware: LEGO Renesas Board (AGL Reference HW)
        - Hypervisor: COQOS Hypervisor
        - VM: 1 AGL Backend (HH 8.x) & 1 AGL Frontend (HH 8.x) => think about updating to Jellyfish
        - virtio devices: blk, net, input, gpu(2d), gpu(3d? may be passthrough)
      - Volunteer 2: Linaro (VICTOR DUAN)
        - Hardware: 96Board
        - Hypervisor: Xen Hypervisor
        - VM: TBD
        - virtio devices
    - option 2: get funding support from Linux Foundation (PoC in the name of AGL community)
  - Potential Target Event:
    Walt Miner to check if possible to present PoCs in the name of Virtualization EG (ALS, AMM)
    - **2020.12 AGL ALS held virtually on December 2~4 (option selected. will attend in the form of virt-eg)**
      - Jerry, Jiancong Zhao to send a title and abstract for the talk to Walt Miner (by 23 Sep 2020)
    - 2021.1 CES2021 AGL will not attend CES2021
    - 2021.3 AGL AMM

Update on AGL Virtualization White Paper

- Purpose:
  - A summary of virtio discussion in AGL Virtualization EG
  - To update original contents in the white paper published 2 years ago
  - To include new topics such as standardization in automotive virtualization (virtio) in the whitepaper
- Previous AGL Virtualization White Paper: https://www.automotivelinux.org/blog/2018/06/20/agl-publishes-virtualization-white-paper/
- Possible Topics:
  - Role of AGL in virtualization standardization (compared with other OSS promoting community such as GENIVI, OASIS)
  - Device Virtualization (VirtIO) Related
    - What is VirtIO and why it is important
    - How VirtIO can be used in automotive (uses cases in IC, IVI, Telematics)
    - Sample VirtIO-based architecture
    - Performance Indicator/Criteria for different virtual devices. Possible open source tools for the evaluation.
  - Future of Standardization in Virtualization of Automotive (such as virtio-backend standardization)

Status: Pending Walt Miner to find the editable version of previous whitepaper

VirtIO Frontend Integration In AGL

- Activity Leader: Mikhail Golubev
- Yocto layer to enable user to choose whether to use VirtIO or not.
- Introduce virtio-blk, net, console, random generator, gpu2d&3d in AGL K
  - release date: 12 Feb 2021
  - release candidate 1: 20 Nov 2020
  - release candidate 2: 02 Dec 2020
    (ddl to include new feature in to AGL K is RC2)
- Introduce other standardized and upstream available virtio devices in AGL L

VirtIO Backend Standardization Discussion

Pending to find a volunteer to lead the activity

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