Agenda

› Discuss framework for AGL video/camera support

› Update on compositor progress and plans
AGL video project scope: PipeWire

› Stream setup and configuration framework

› Container-ready stream exchange framework

› Stream policy management
  › with WirePlumber

› Application isolation & security

› Low-level, real-time processing capabilities
AGL video project scope: Similarities with Audio

› Principles are not different, just the data
  › Input / processing / output
  › Streams: local, remote, in network
  › Policy restrictions
› Reusing the same infrastructure makes sense
AGL video project scope: Benefits

› Security: hardware isolation from apps & containers
› Resource sharing
  › ex. front camera shared between IVI and deep learning containers
› Streaming
  › Zero-copy streaming between containers
  › Secure capture from compositor through PipeWire
AGL video project scope: First Steps

1. Enable video capture support in AGL PipeWire builds

2. Build a demo camera application for experimentation

3. Establish further requirements and document next goals
AGL video project: Goals, scope and hardware

› Specify initial use cases
  › i.e. rear-view camera, dash camera, deep learning, 360 degrees top-view, ...

› Need automotive video capture hardware
  › Anything with V4L2 drivers would work out-of-the-box
  › Specialized sensors, network video streams, ...

› Video playback hardware (& software) matters
  › Camera video should be passed through to the display
  › Need support from hardware, kernel, graphics drivers
AGL video project: Requirements and features

› Automotive requirements
  › Latency, security, safety
  › Discuss, understand, iterate on the design
  › Reflect on PipeWire, upstream as much as possible
› Additions may be needed in PipeWire & WirePlumber
› Bring GStreamer up to speed to support applications
AGL video project: Challenges

› Supporting time-to-rear-view-camera usecase

› No support in Linux kernel for power-on presentation of rear view

› ‘Live source’ proposal for DRM/KMS prepared but not advanced

› Extremely platform-specific, would require specific enablement
AGL video project: Challenges

› Complex camera processing pipelines
  › libcamera project created to support dynamic camera ISP pipelines
  › Further development required to support this on all platforms

› Zero-copy sharing with machine-learning platforms
  › No standard for zero-copy sharing of large image or video buffers between acquisition hardware and machine-learning processing hardware
  › Further investigation and development required to enable this
AGL compositor update: 2020 achievements

› AppFrameWork integration, client shell + demo apps ported/updated
› supports Qt/HTML5 toolkits, HTML5 through chromium/ozone
› policy engine with customisable static policies w/ RBA implemented as a policy
› rebooted and updated Waltham, updated transmitter/receiver demo apps
› adding screenshots within CIAT for basic application testing (integration phase)
› support and help out both regular users and OEM vendors on various inquiries and questions about Wayland and compositor related topics
AGL compositor update: 2021 plans

› Possibly uprev libweston to new upstream: depends on Renesas BSP schedule
  › Kurokawa-san, please provide an update on the schedule

› Continue to support IVI/PR and IC groups for all usecases

› Support for verifying compositor within CIAT

› Investigate multiple backends for dynamic remote-output support using PipeWire, to integrate with IC system
  › Efficient cross-domain, buffer sharing mechanism between IC <-> IVI

› Content highlighting and multiple gestures handling to migrate content to other outputs
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