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Wayland IVI Extension

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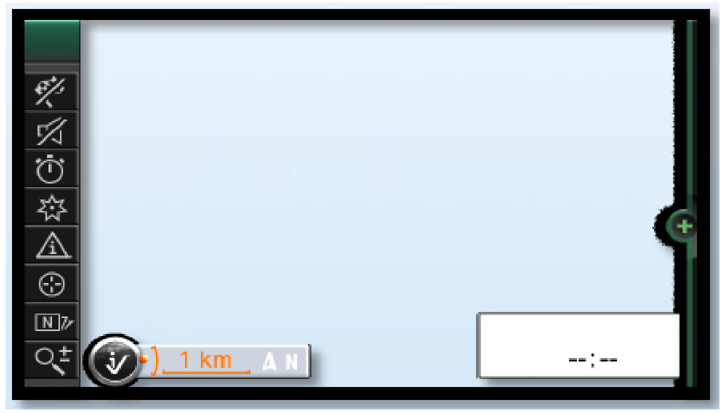
Wayland IVI Extension

Agenda

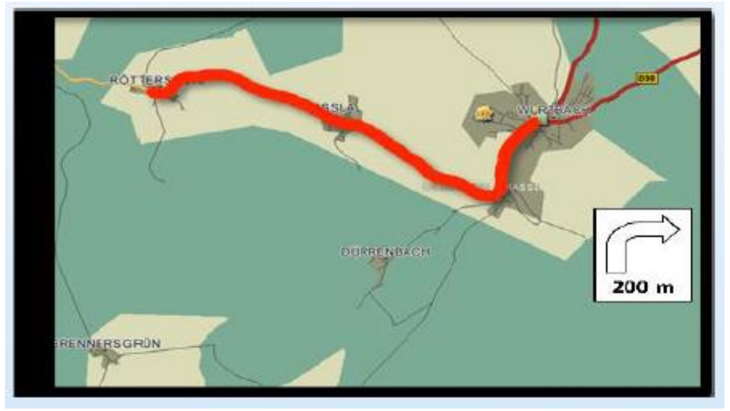
- Short introduction of wayland-ivi-extension
- Current status of wayland-ivi-extension repository
- ivi-controller protocol update
- New challenges
  - Xdg-shell support
  - Using libweston
  - Virtualization
  - Resource management: not really new but still not realized

Introduction of wayland-ivi-extension

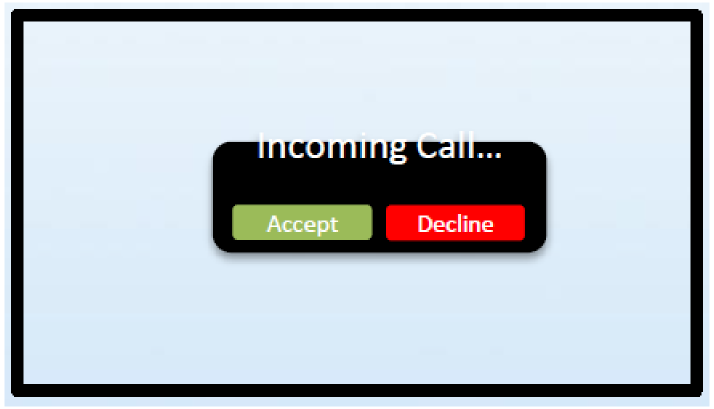
- Graphical content is produced from different applications
- Compositor is in change to combine it to a single view



HMI



Navigation



Popup

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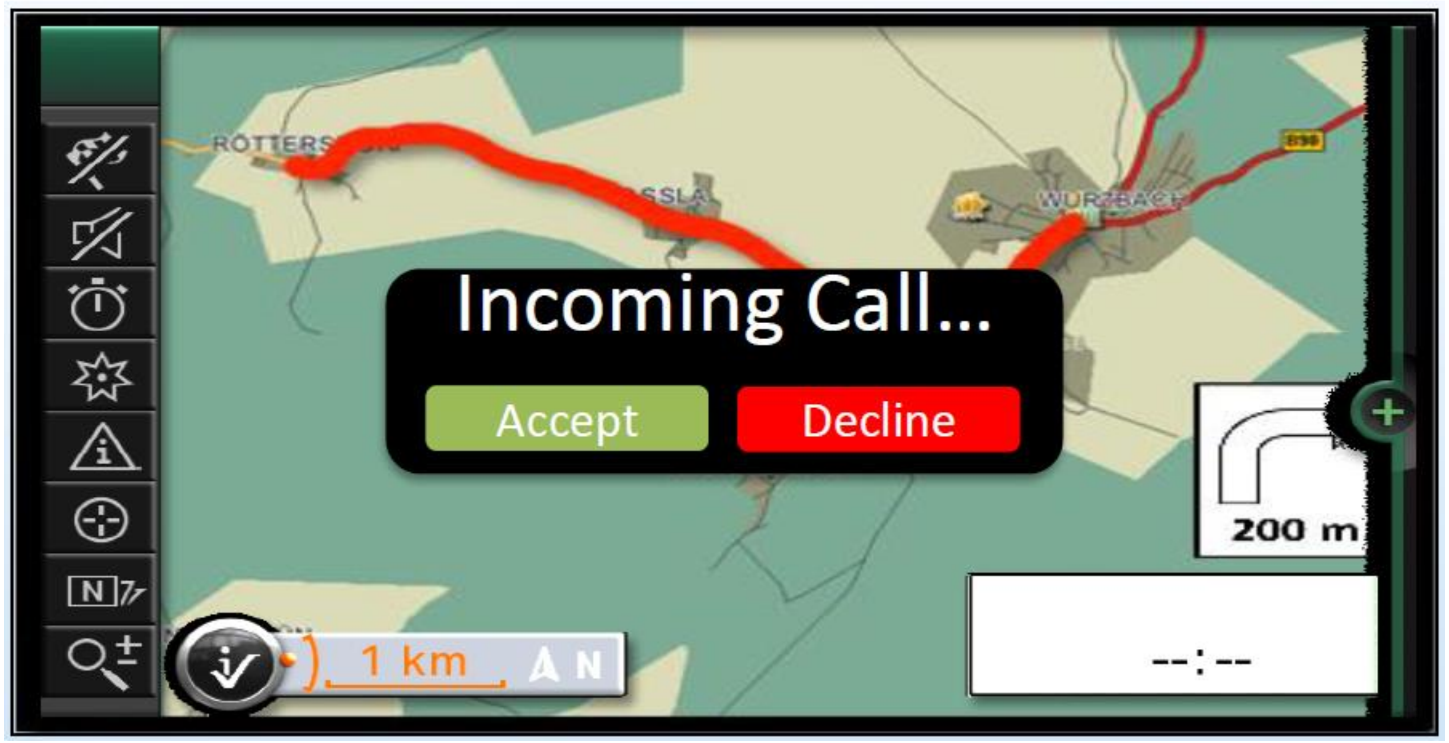
Introduction of wayland-ivi-extension

- Wayland-ivi-extension provides an interface to control the composition and input routing
- Control is possible from an separate application which is not a compositor
  - allows flexible implementation of window managers
  - Allows using the same compositor across projects



Current status of wayland-ivi-extension repository

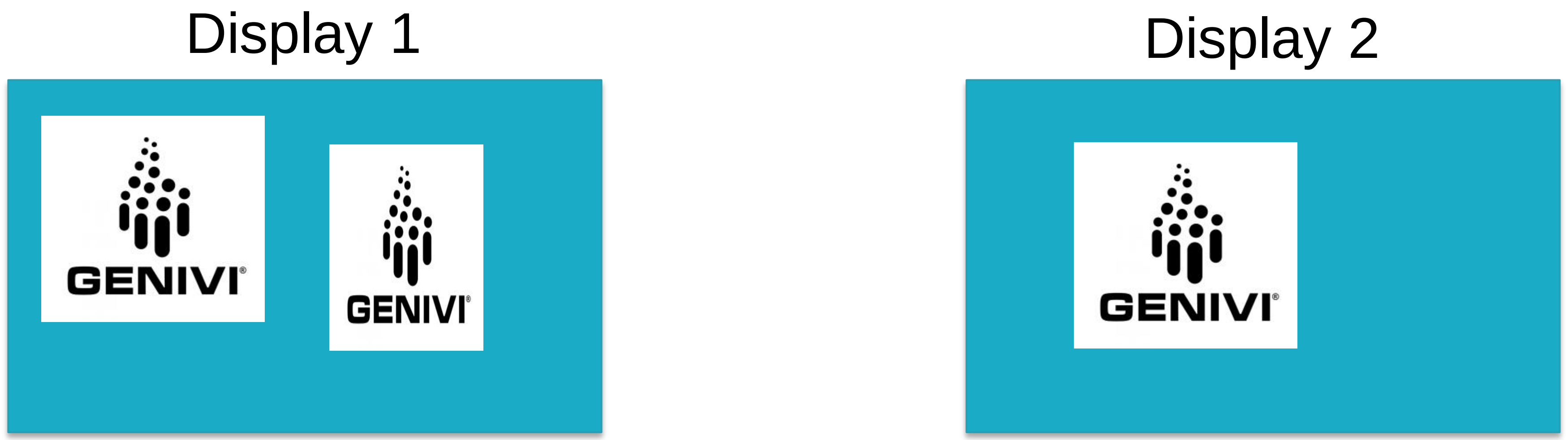
- Github project
  - 24 closed, 3 open pull request in last year
  - 6 contributors
- Most important updates
  - deprecated APS's
    - Complete ilmClient API: use ivi-application protocol direct
    - ilm_surfaceGetPixelformat: doesn't make sense for ilm surface pixel format is provided by the attached buffer
  - Adaptation for weston 2.0
    - Renesas GPU stack has a problem, buffers are inverted
    - Workaround reverts commit 319397e050e2b4833e10093ccefd8ad77a6ef78d in weston
    - Correct fix should be done in the GPU stack

ivi-controller protocol update

- Motivation for the update
  - Reduce round trips between ivi-controller and compositor
  - Simplify implementation of some ilm API‘s
  - Remove unused parts of the protocol
  - Simplify wayland object lifecycle
- Better error handling
- Introduce surface types
  - Desktop compatible surfaces
  - Restricted surfaces

ivi-controller protocol update (cont.)

- New features
  - Visualize one surface on two displays
  - Visualize one surface on one display in two different views
  - Display hotplugging
  - Predefined display IDs



Discussion on the new protocol update

New challenges: xdg shell support

- xdg-shell is supported by freedesktop.org
- Freedesktop is building a base platform for desktop software
- Backend for application visible APIs as such:

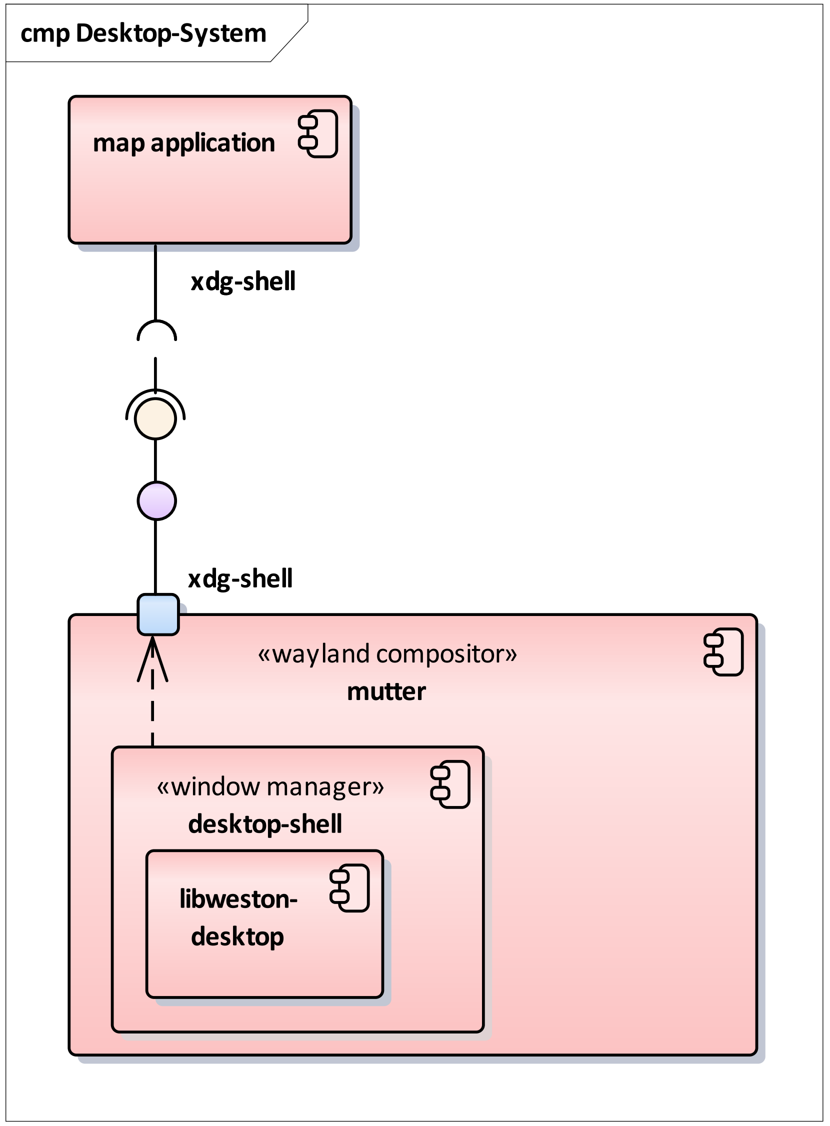
GNOME™

Qt

gstreamer

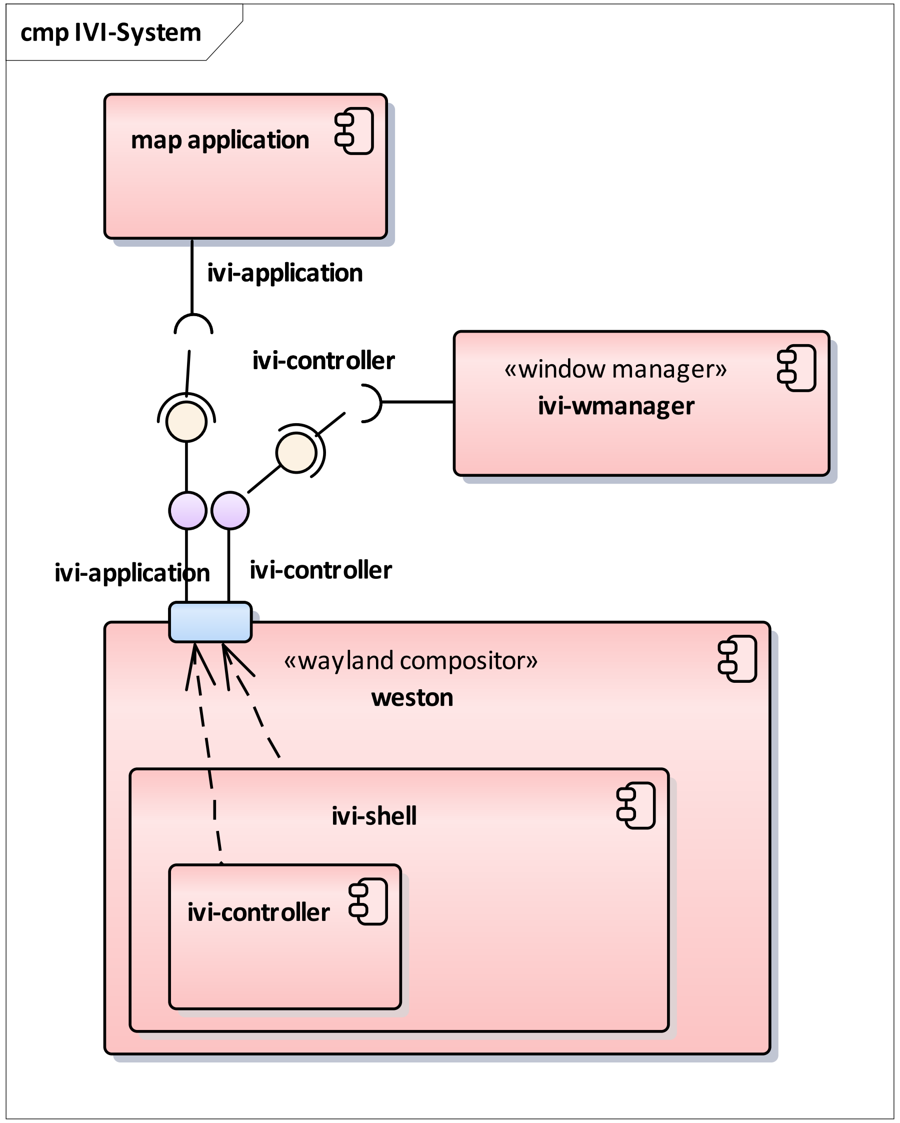
New challenges: xdg shell support

Desktop setup



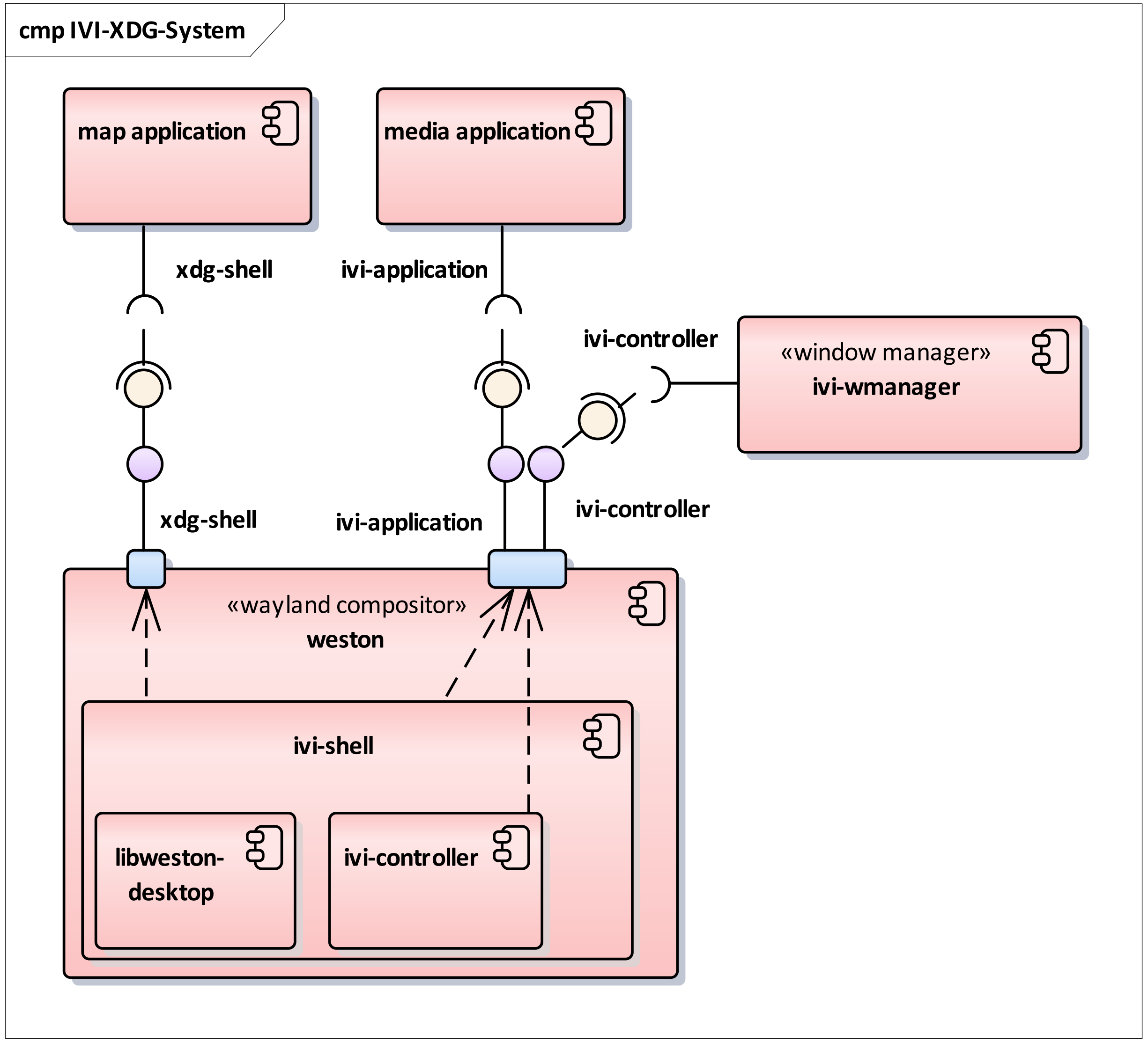
New challenges: xdg shell support

IVI setup



New challenges: xdg shell support

IVI with xdg setup



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New challenges: xdg shell support

- ivi-application protocol does not offer much benefits:
  - It is only used to assign surface IDs for application surfaces
  - Every application has to be modified to include unique Ids
  - IDs are not portable across projects
- xdg-shell offers:
  - Easier integration of desktop applications in ivi system
  - Support open source frameworks out of the box
  - Existing desktop applications could be use as it is

New challenges: xdg shell support

- xdg shell is designed for desktop environment
  - Some of the defined events and request are not applicable in ivi systems
- We still need to have surface IDs to be able to control surfaces from a HMI controller.
  - Application will use xdg shell and will provide “name”
  - ivi-shell can generate surface IDs
  - ivi-shell can read IDs from a database
- Startup critical applications need special handling:
  - default minimal scene
  - Defined id and behavior for early apps

Discussion on the xdg shell support

New challenges: Using libweston

- We can use libweston instead of weston compositor
  - We can create our own compositor with greater flexibility
  - We can still reuse upstream core weston code
- Different versions of libweston could be installed on parallel
- Easier to maintain and update wayland-ivi-extension
  - We can move ivi-shell code to wayland-ivi-extension repository
  - We can stick with one version of wayland/weston for longer time

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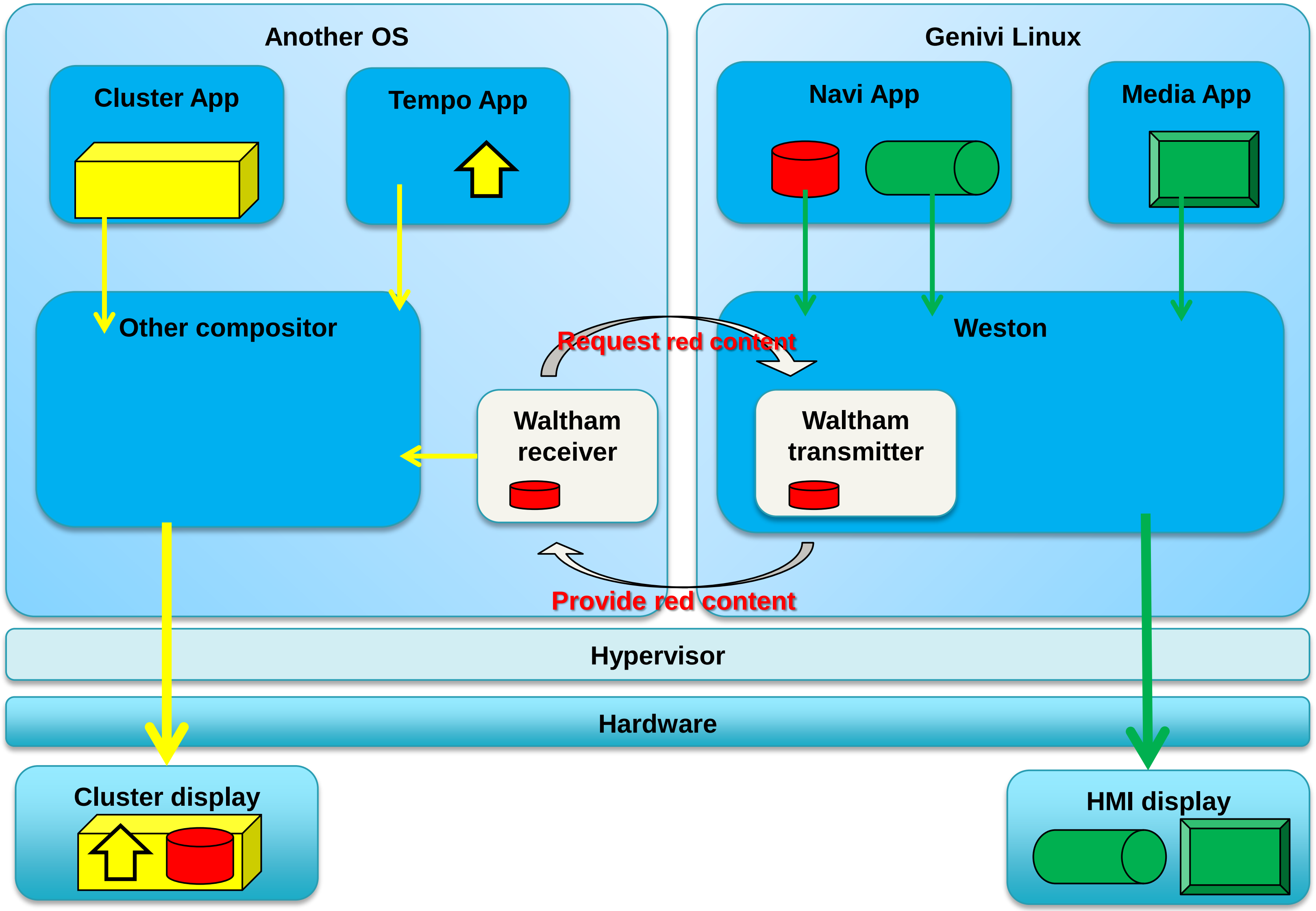
New challenges: Virtualization

- Complex systems
  - Complexity affects a lot of hardware and software layers in the system

New challenges: Virtualization



- Each OS has it's own display
- One or several application content is shared from one OS to another
- Bidirectional sharing of content could be required

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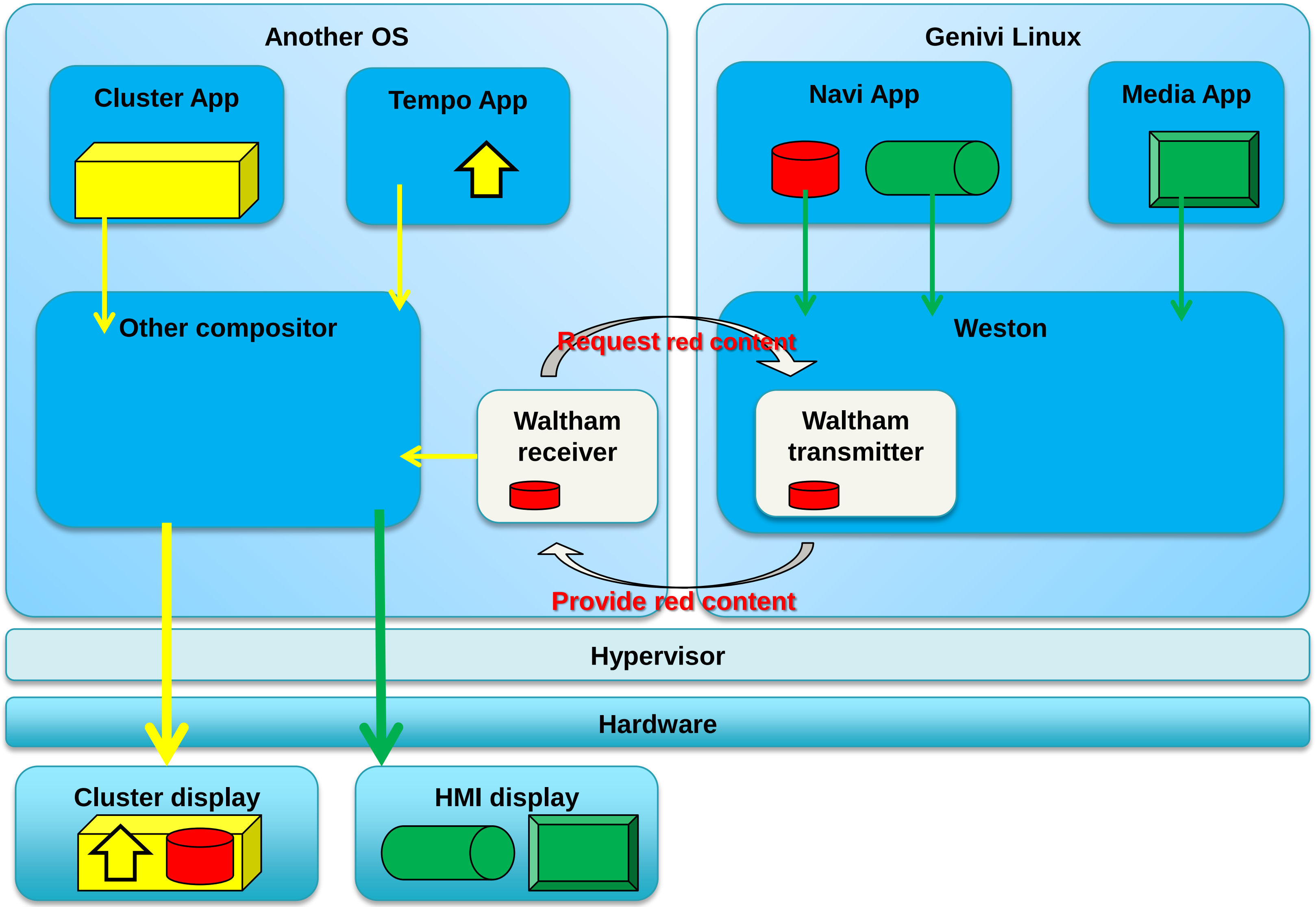
New challenges: Virtualization



- All displays are connected to one OS
- All application content is shared from one OS to another, here from Genivi Linux -> Another OS

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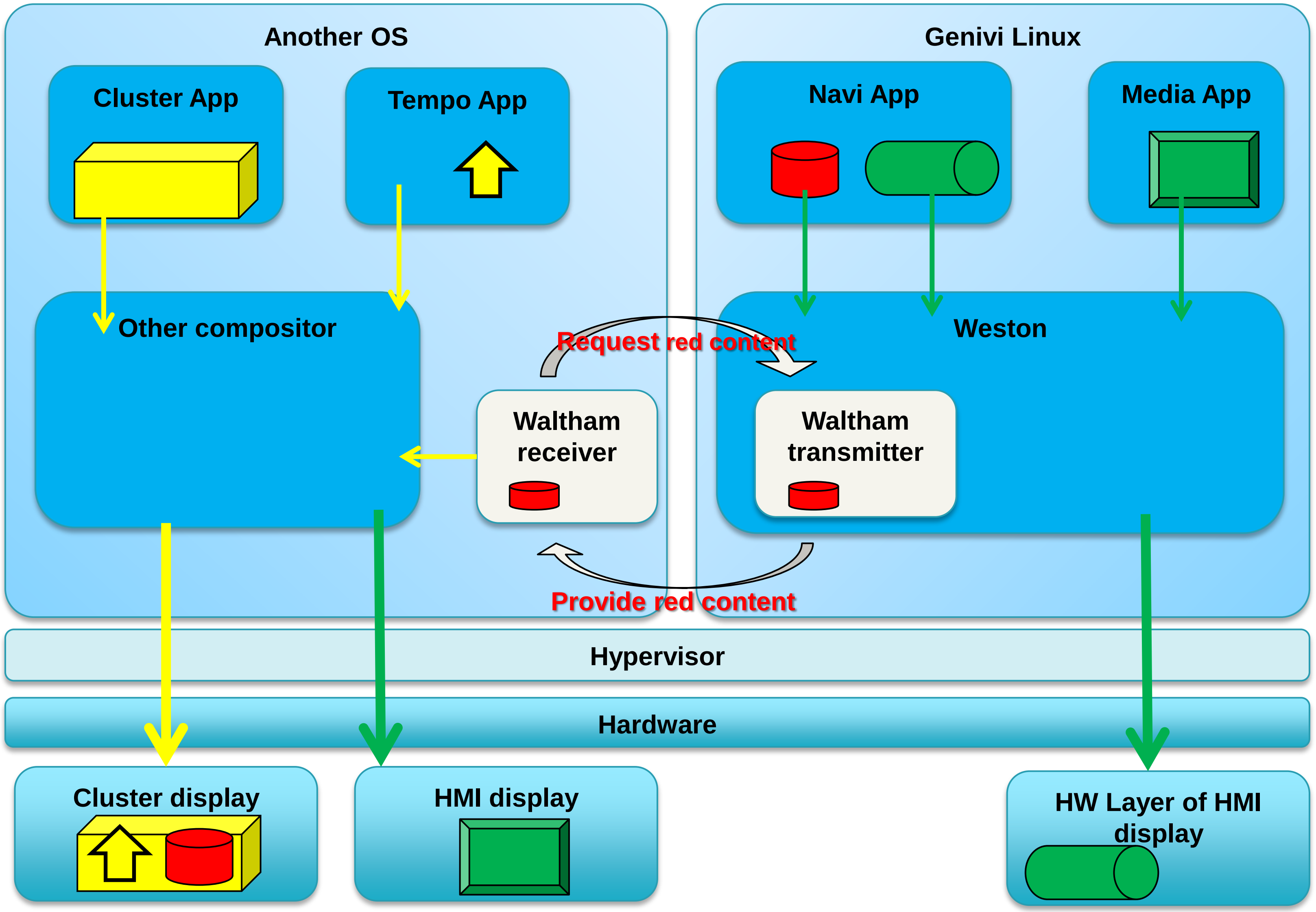
New challenges: Virtualization



- All display are connected to one OS
- But Genivi Linux has controll of a hardware plane on HMI display
- Each OS is able to display content on the display directly
- Handling of application content is complex

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New challenges: Virtualization

- How virtualization affects compositor?
  - We have to send and received content to a different OS and used it in the composition
- How virtualization affects ilm interface?
  - HMI controller could need a way to find out if the surface is a remote or local surface
  - This information is also required to forward the input event correctly

Discussion on virtualization

New challenges: Resource management

- Are there enough resources in the system to display or render particular use-case?
- Do we need clear separation of resource and policy management?
- Support for sending and receiving content to a from different OS in virtualization environment

Thank you!

We definitely expect some questions!!!

Visit us https://at.projects.genivi.org/wiki/display/WIE/Wayland+IVI+Extension+Home

Contact us: genivi-ivi-layer-management@lists.genivi.org