

# Murphy integration to Weston in Tizen IVI

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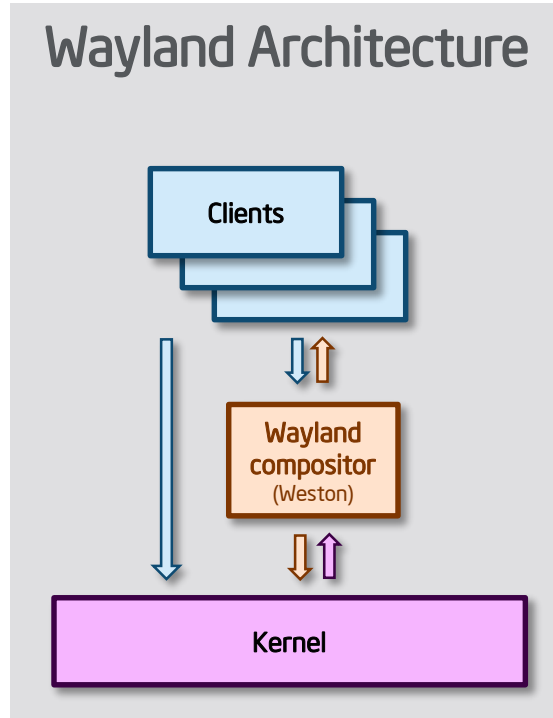
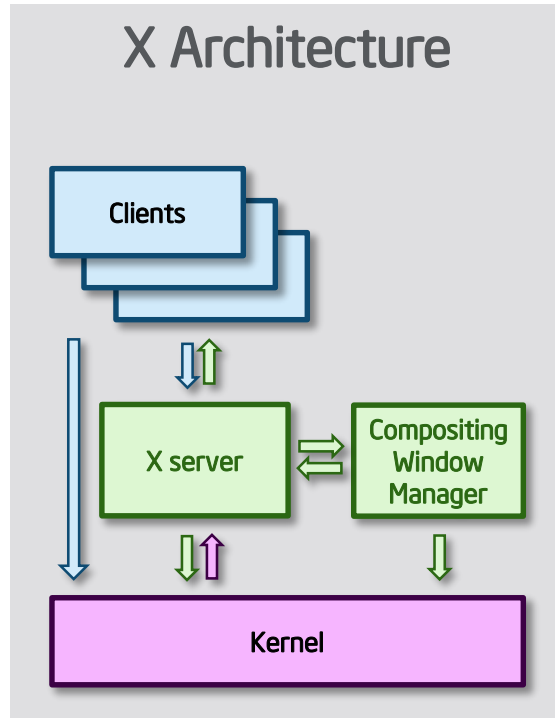


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INTEL LINUX GRAPHICS SYNCEVOLUTION SIMPLE FIRMWARE INTERFACE (SFI) ENTERPRISE SECURITY IN

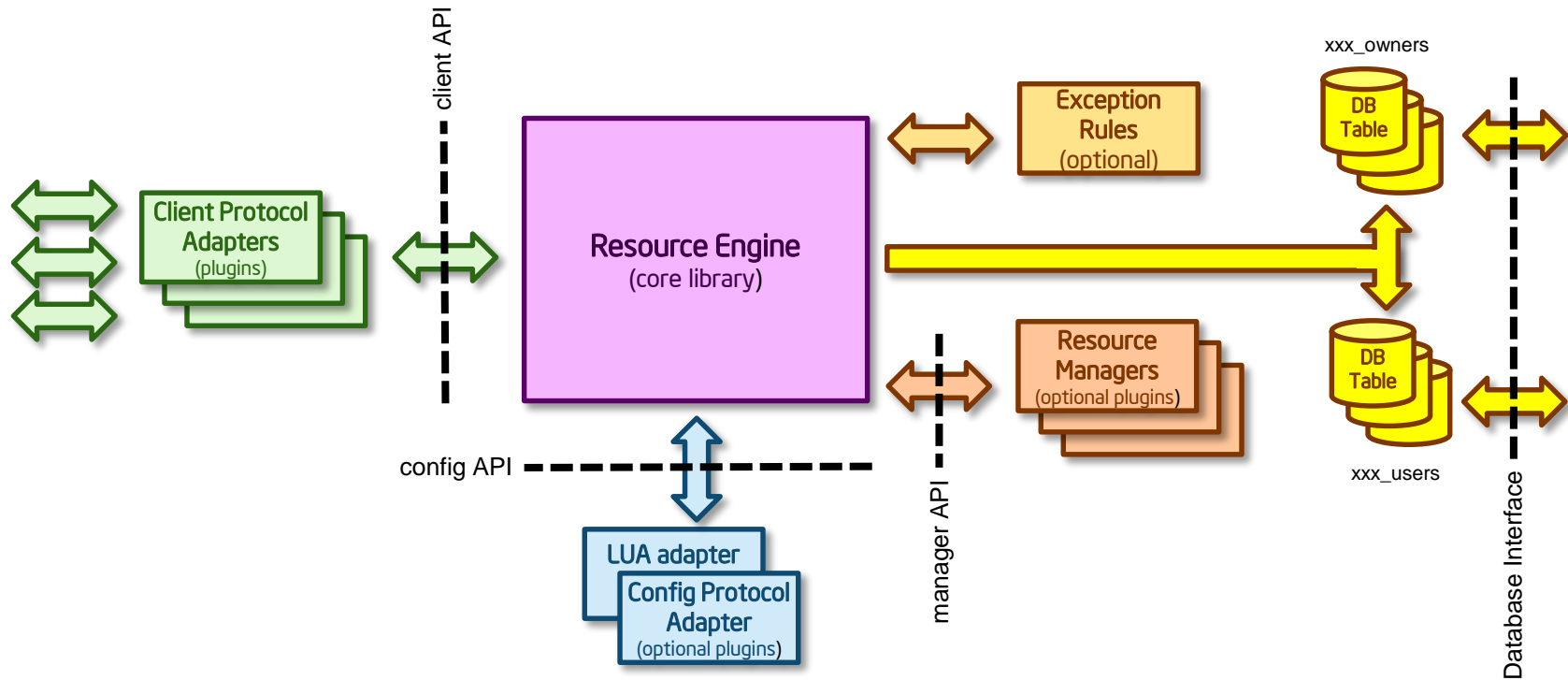


# Background

# Wayland Architecture



# Resource Management Framework in Murphy



# Screen Management Building Blocks

- **Regulator**
  - Logic to adapt vehicle state, driver activities and application usage scenarios
  - Set of rules and/or state machines
  - Determines what applications can be active
- **Layout Manager**
  - Manages Areas and Layers
  - Assigns and moves surfaces to areas/layers
  - Depends on Regulations
- **Resource Manager**
  - Decides what active applications can do and when
  - Depends on Regulations
- **Application Launcher / Task Switcher**
  - Launches/kills application
  - Requests to switch active application
- **Screen Controller**
  - Carries out / enforces the decisions of Layout & Resource Manager
- **Input Controller**
  - Carries out / enforces the decisions of Input & Resource Manager



# Basic Usecases for Screen Management

- Application launching
- Task switching
- Regulation changes





# Evolution of HomeScreen phase 1

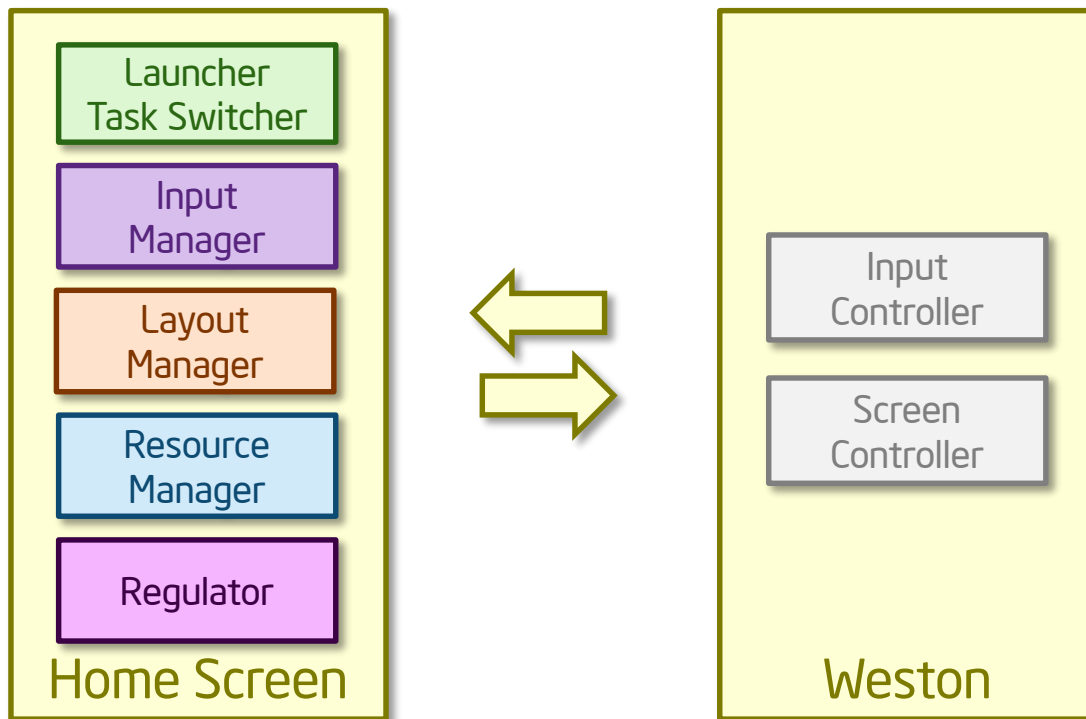
# Phase 1 Executive Summary

- Tizen IVI 2.0
- Toyota-san contributed HomeScreen to Tizen
  - Weston ICO plugins
  - HomeScreen
  - Sample applications
- First version of HomeScreen was monolithic
  - GUI
  - System controller to manage screens, audio, input etc
- Conflicting audio management
  - TIZEN had its own Murphy based audio management for routing and volume ctrl.
  - HomeScreen had its own management for volume control
  - The two stack was not integrated





# Building Block Locations



# Pros and Cons

- Pros
  - Efficient communication between HomeScreen and Weston
- Cons
  - Conflicting Tizen and ICO audio controllers in PulseAudio
  - Monolithic
    - GUI and control logic were grown together
  - Configuration
    - Limited
    - No scripting





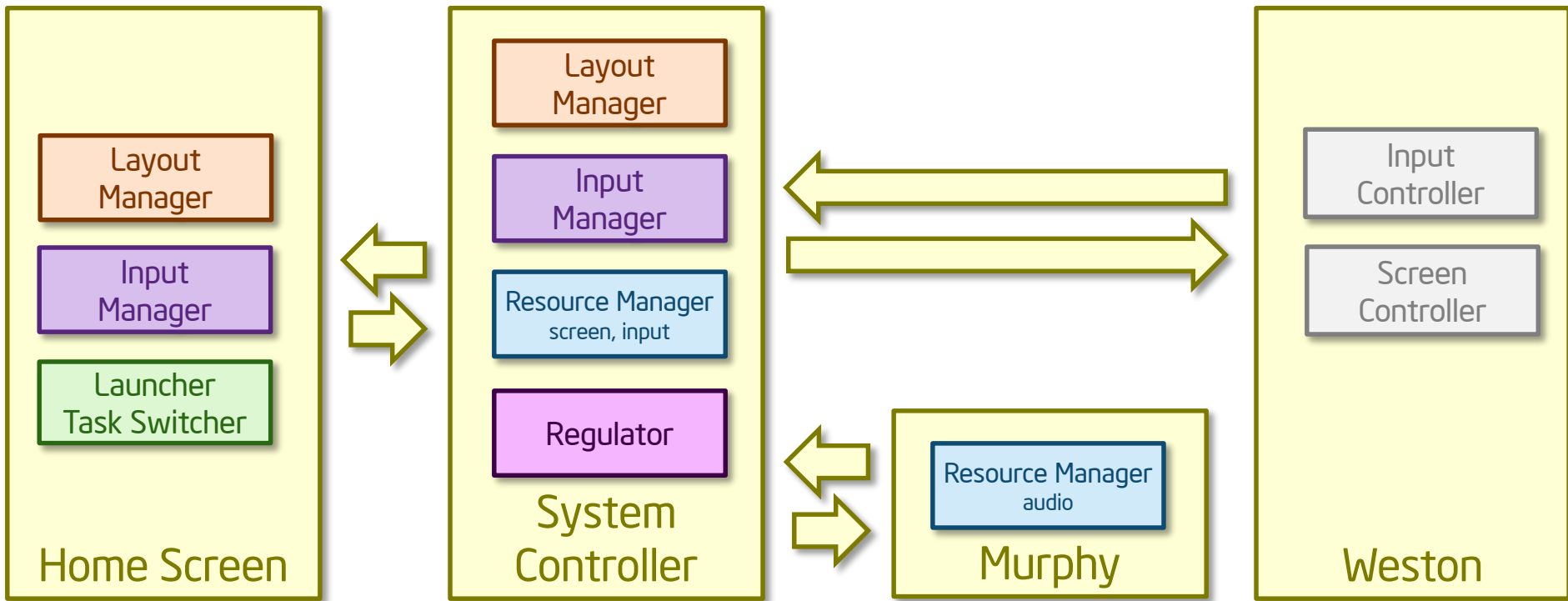
## **Evolution of HomeScreen phase 2**

# Phase 2 Executive Summary

- Tizen IVI 3.0, 2013EOY
- Integration of the audio stacks
  - Home Screen refactored
  - System Controller was separated and run outside of HomeScreen as a daemon
  - Audio resource management was linked to Murphy
- Home Screen improvements
  - Look & feel has changed
  - Improved configurability and better integration for TIZEN infrastructure



# Building Block Locations



# Pros and Cons

- Pros
  - GUI and control logic separated
- Cons
  - Both HomeScreen and SystemController have layout management logic
  - Proxying Weston messages represent an extra hop
  - Simple integration to TIZEN resource management
    - Oversimplified audio management
  - No scripting





# Evolution of HomeScreen phase 3

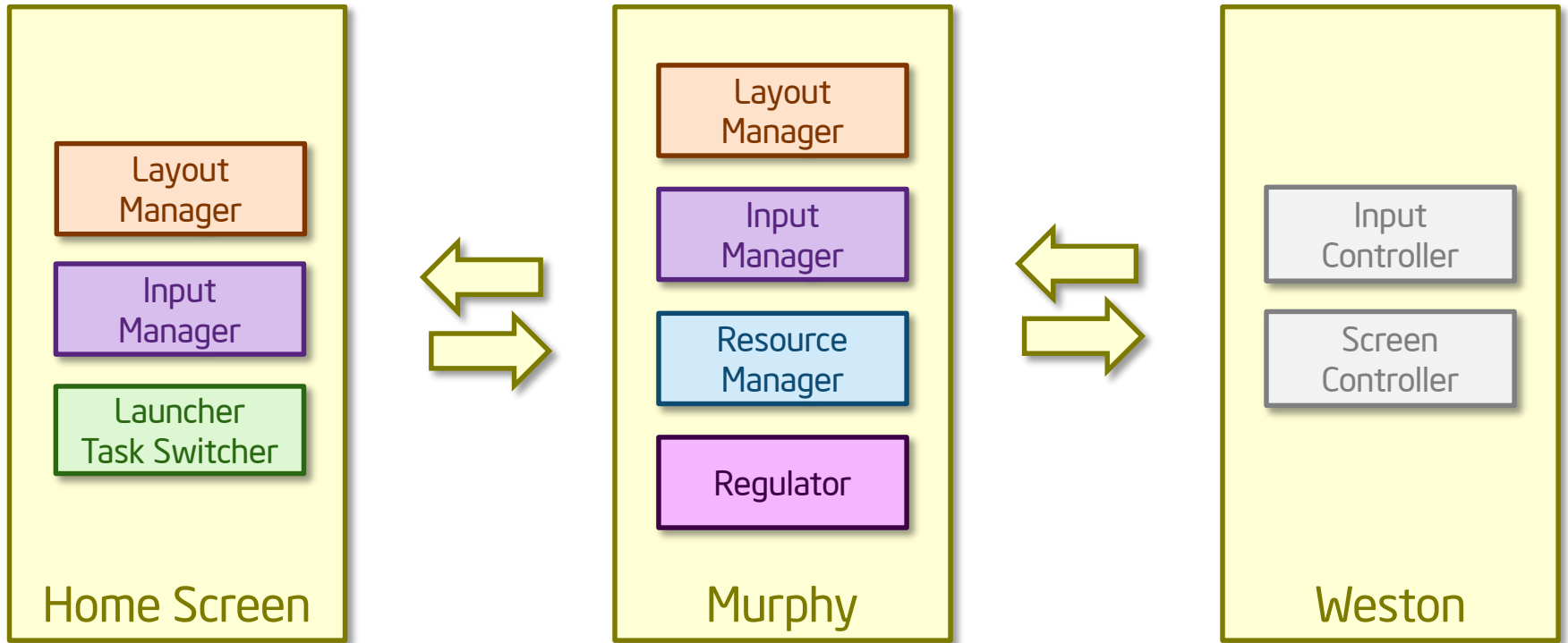
# Phase 3 Executive Summary

- Tizen IVI 3.0 image 20140318.3
- Functionally equivalent to Phase2
- System controller is implemented in Murphy
  - The Murphy implementation is a drop-in replacement to SystemController written in C++
  - Could be tested by installing the relevant Murphy plugins
- Uses the ICO weston plugins
- Snapshot only
  - Migrating from ICO weston plugins to GENIVI compliant IVI shell was prioritized over the reimplementaion of System Controller in Murphy
- Paralell efforts
  - Toyota team worked on migration to GENIVI shell (see phase 4)
  - Intel team worked on reimplementaion of SystemController in Murphy





# Building Block Locations





# Pros and Cons

- Pros
  - GUI and control logic separated
  - Full integration to TIZEN resource management
  - Scriptable => highly configurable
- Cons
  - Both HomeScreen and SystemController have layout management logic
  - Proxying Weston messages represent an extra hop
  - Works only with the deprecated ICO weston plugins





# Evolution of HomeScreen phase 4

# Phase 4 Executive Summary

- Tizen IVI 3.0 M14.2
- Uses the IVI-shell instead of ICO Weston plugins
  - IVI-shell is GENIVI compliant
  - IVI-shell upstreaming is ongoing
- Functionally equivalent to Phase2






# Evolution of HomeScreen phase 5

# Phase 5 Executive Summary

- Tizen IVI M14.3
- Merge of Phase 3 and Phase 4
  - System Controller is implemented in Murphy
  - Uses the IVI-shell
- No new functionality
  - Functionally equivalent to Phase 4





## **Future directions (life after phase 5)**

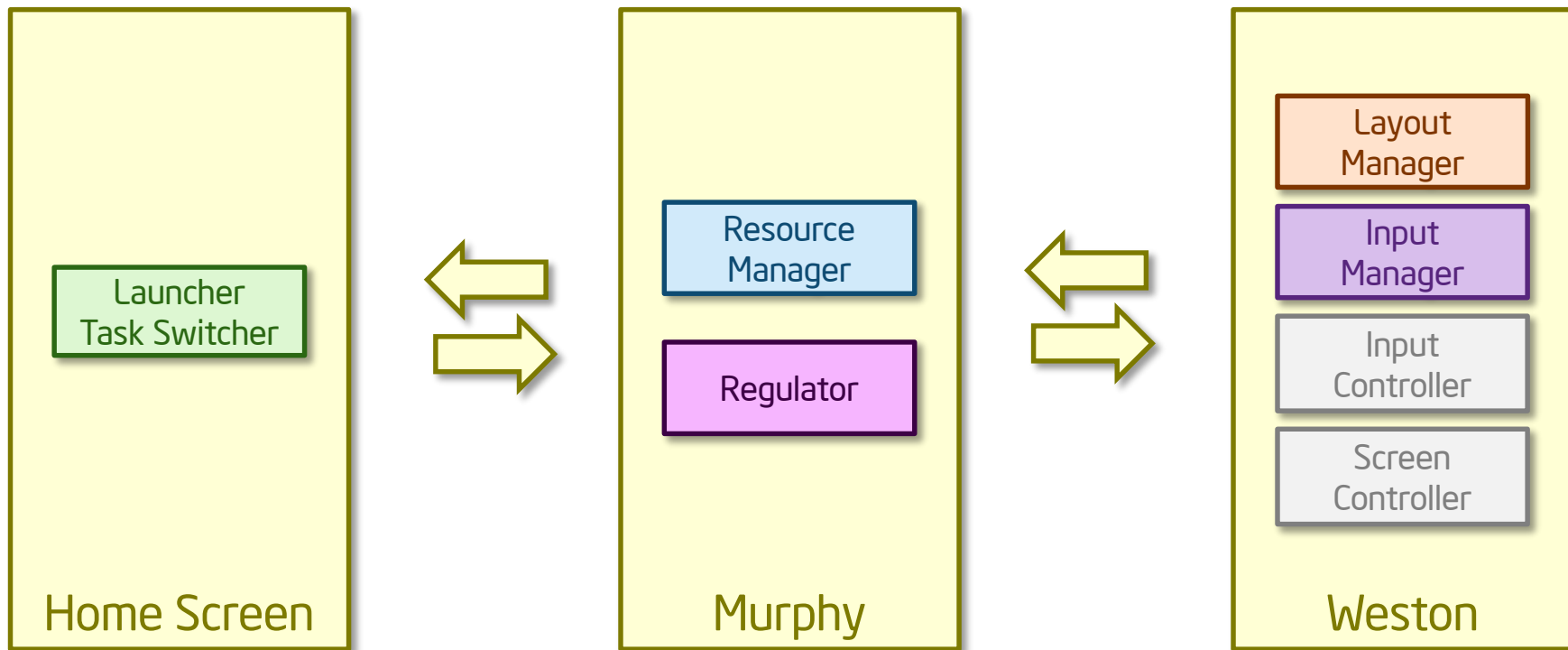


# Main goals

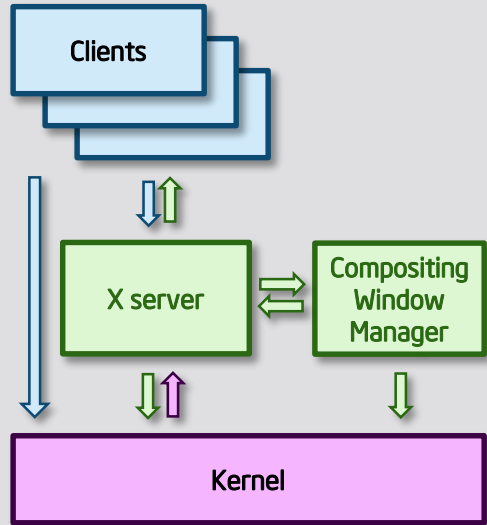
- Further data flow optimisation
  - move layout and input management to Weston
  - build a PoC to verify the idea
- Work with OEMs and Tier1s on regulator
  - Regulations are currently rule based
  - Verify whether the current mechanisms are covering all the needs
  - Do we need new mechanism beside rules?
    - eg. Table driven approach



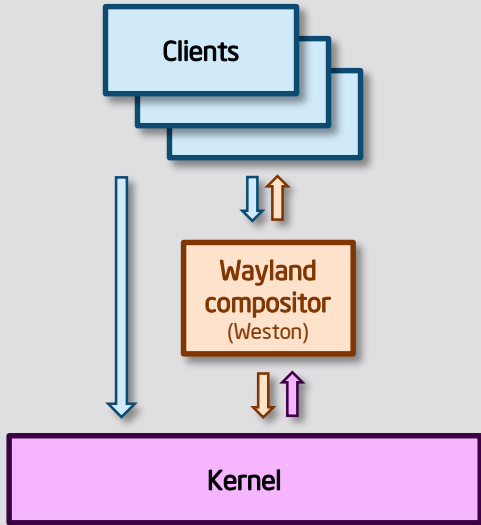
# Building Block Locations



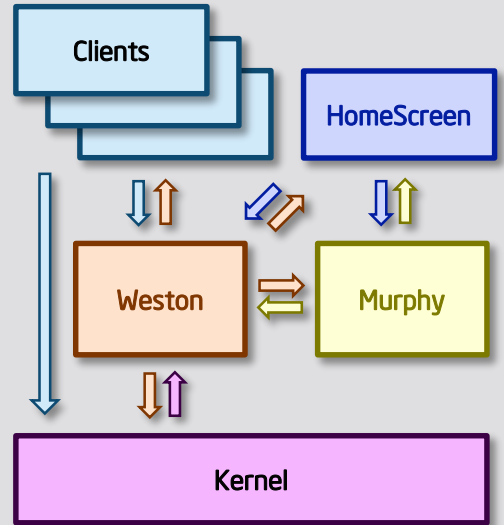
## X Architecture



## Wayland Architecture



## Tizen Architecture



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