Browser Solutions for GDP

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Acknowledgements

Browser Architecture
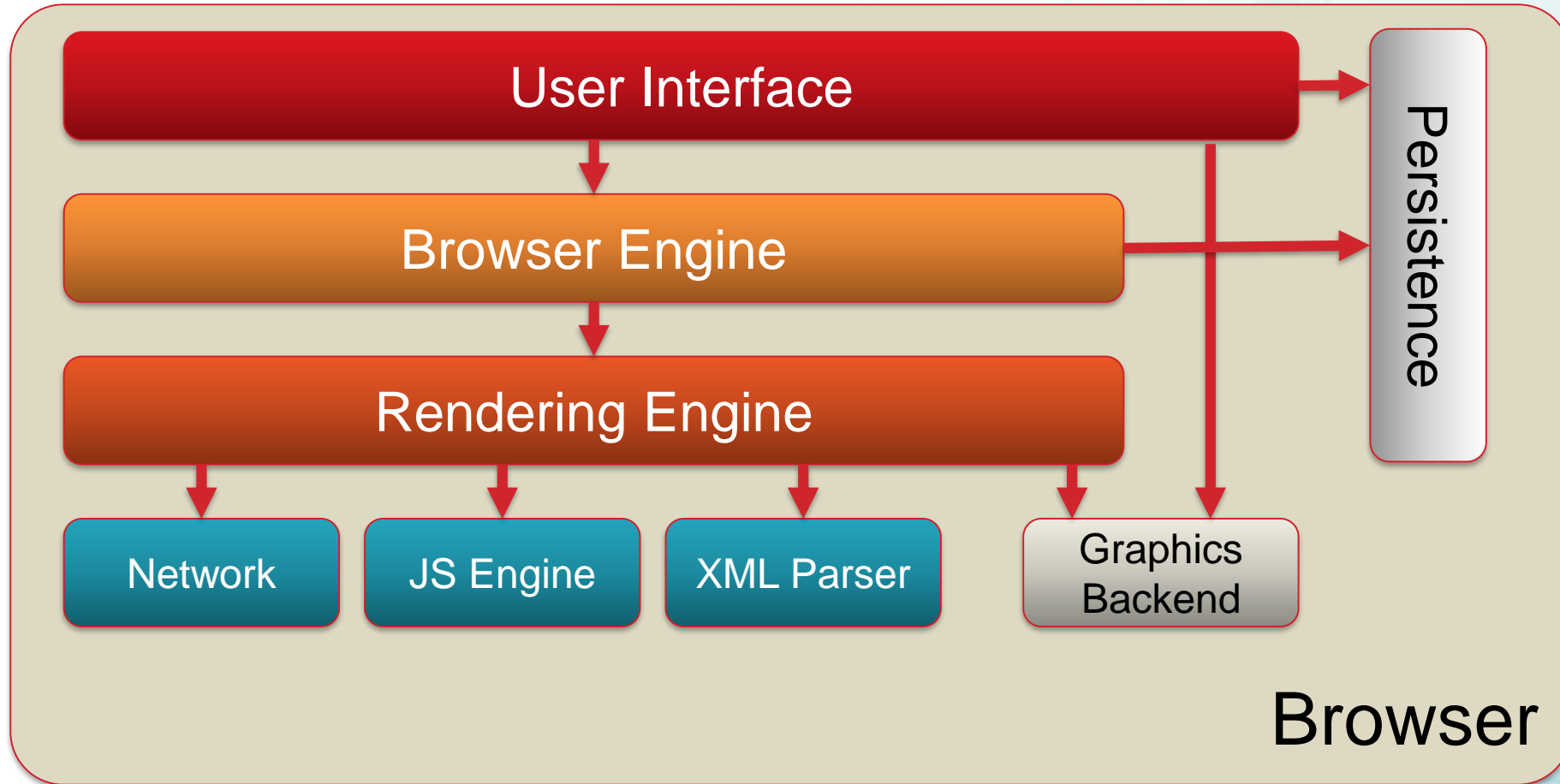
Web Runtime Architecture

Application

API

Browser Engine

Rendering Engine

Network

JS Engine

XML Parser

Graphics Backend

Persistence
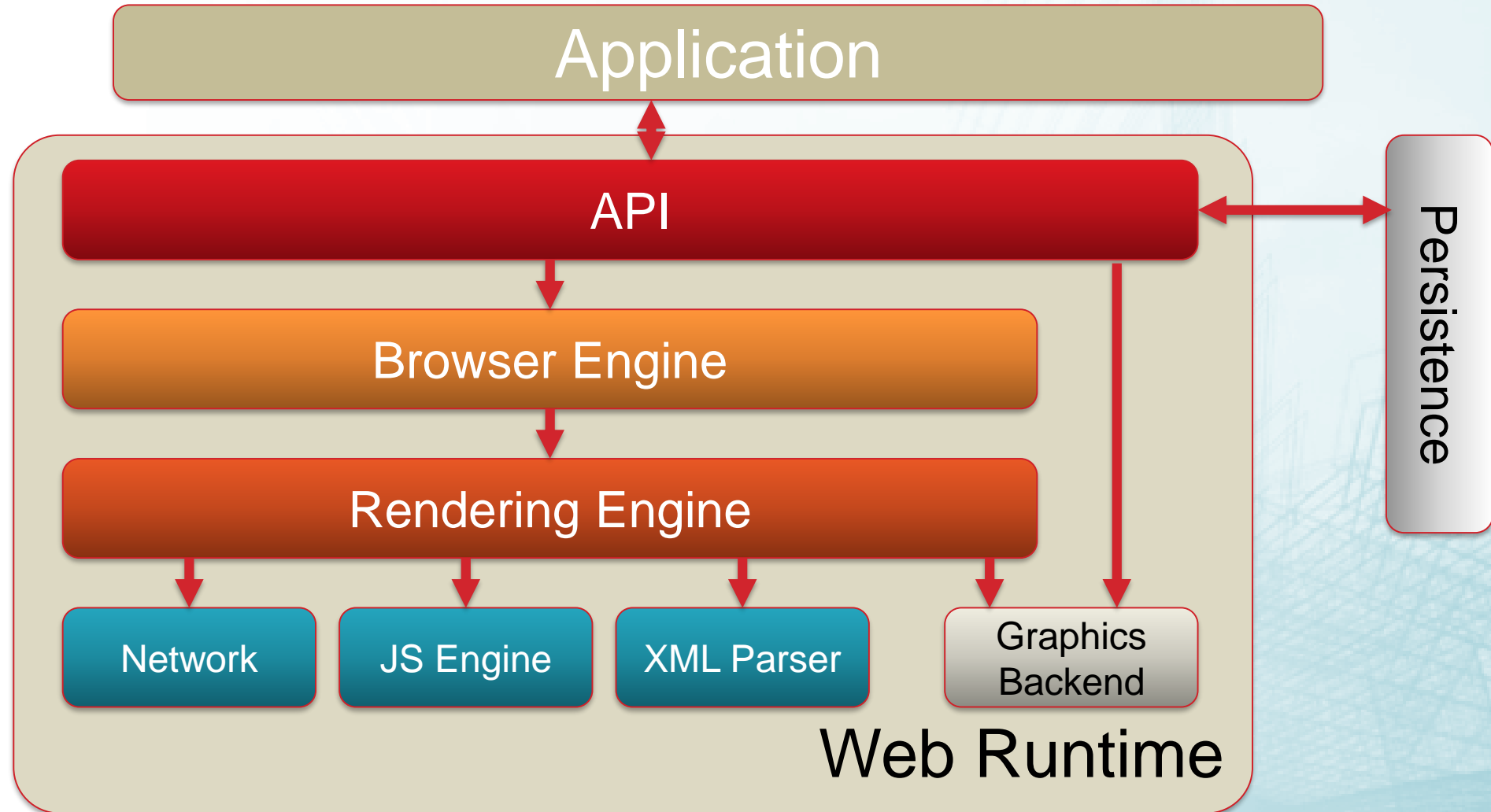
Web Runtime

Choices

- Chrome
  - Complete browser with API extensions for web applications
  - UI layer that includes history, bookmarks, incognito, etc.
- Chromium Embedded Framework (CEF)
  - Core web runtime based on Chromium without UI layer and API extensions for web applications
  - Preserves and interfaces the multi-process architecture of Chromium
  - API for development of applications
- Crosswalk
  - Web application runtime based on Chromium developed by Intel
  - Adapts Chromium's multi-process architecture to its needs
  - Designed to run applications not web pages. Buildout to browser requires large development effort.
- QtWebEngine
  - Evolution of QtWebKit but based on Chromium
  - Integrated with the Qt framework
  - Open-source version is GPLv3 licensed

Requirements for GDP

- Web browser that is compatible with any web applications so that users can surf the web as they would on a PC or mobile device.
- Simple web viewer that can integrate with native platform applications to render HTML and execute JavaScript.
- Dbus API

Chrome and/or CEF with a common APIc

Graphics Backend

- Ozone is Chromium's graphics abstraction layer for different OS platforms. Google maintains Ozone implementations for X11, Windows, MacOS, ChromeOS.

- GDP uses Weston compositor which implements the Wayland protocol. Much simpler than X11 but Chrome does not support it out of the box.

- XWayland is an X Server running as a Wayland client to provide backwards compatibility for X Clients. However, that is a very heavyweight solution just to support a web browser.

Ozone-Wayland
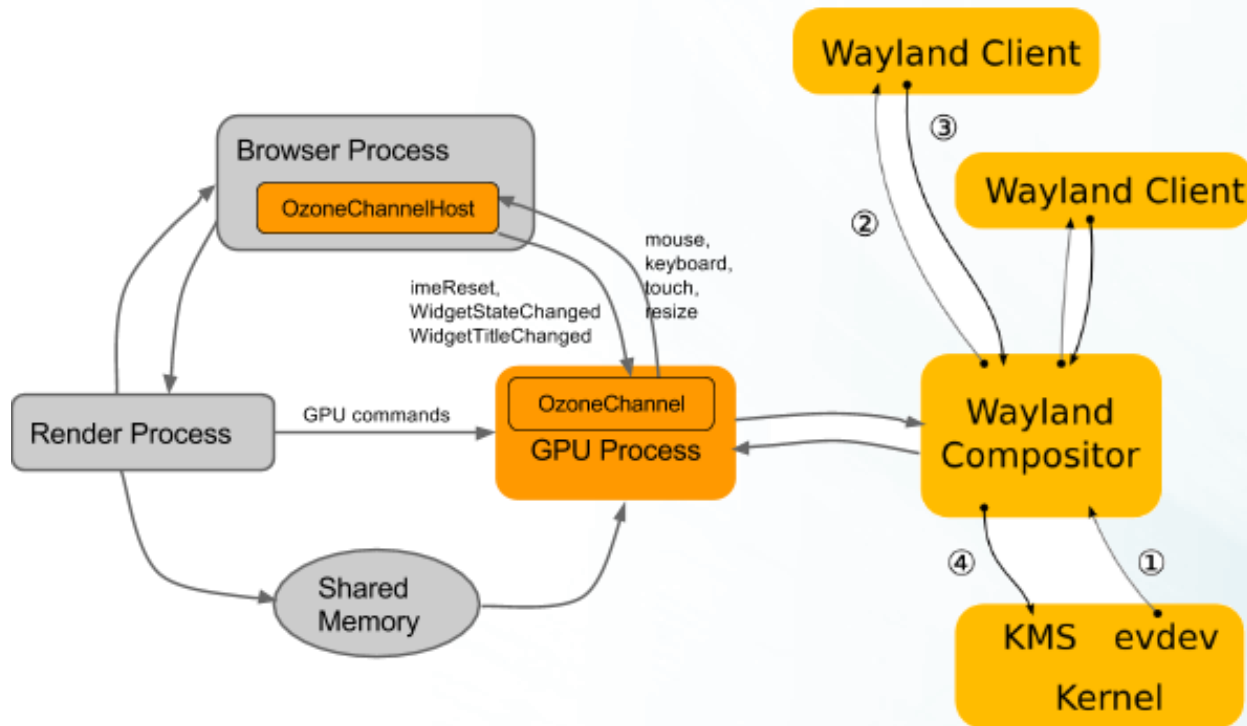
- Ozone-Wayland is an Ozone implementation for Wayland-compatible compositors.
- Originally developed by Intel.
- Currently provides the most of the Ozone functionality.
- Google engineers do not agree with the Ozone-Wayland architecture and developed their own implementation but it is far from being production-ready.

Integrating Chromium with GDP

- Ozone Wayland Completion
  - Multi-seat / Multi-screen
  - Window Resize/Move/Minimize/Maximize
  - Drag-and-Drop
  - Copy-and-Paste
  - Text Selection
- GDP Integration
  - Build Chromium with Yocto for GDP
  - Configure Chromium for GDP platform
  - Create and maintain Yocto recipes

DBus Interface
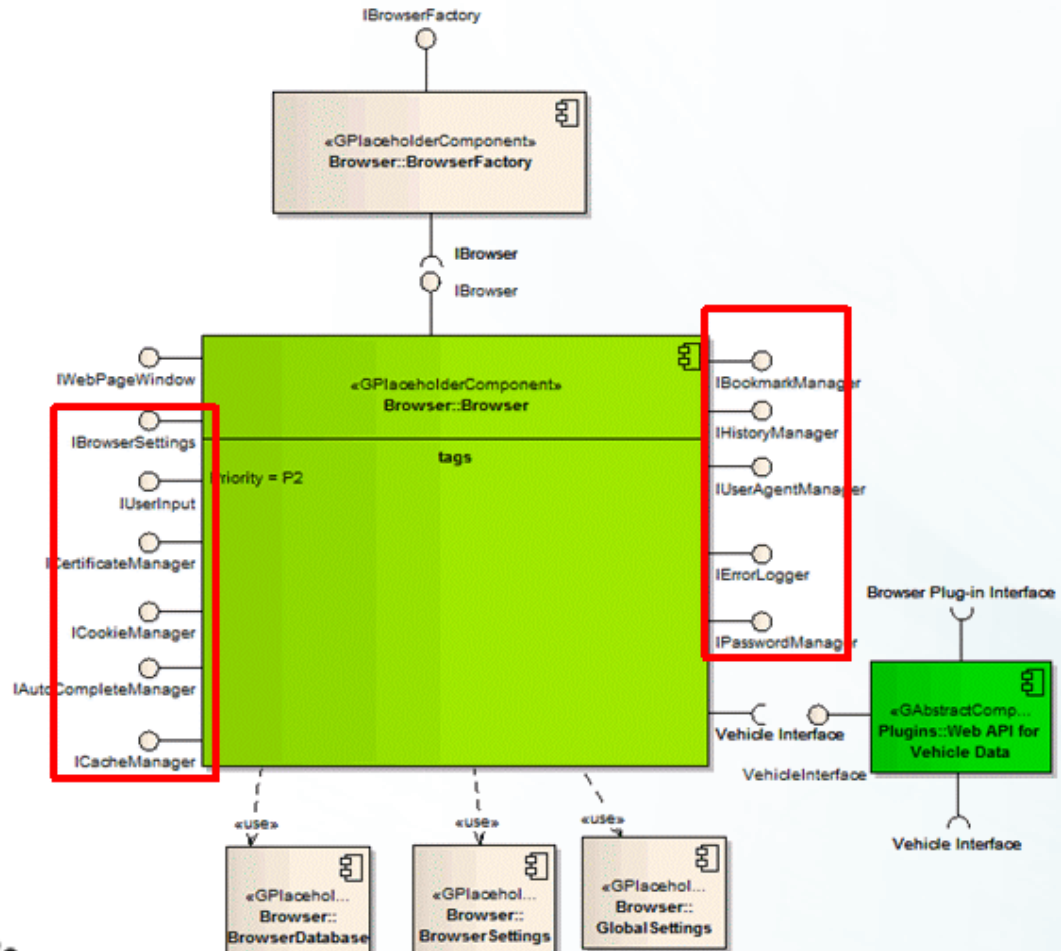
- Current GENIVI specification details interfaces for page window, browser settings, bookmark management, certificate management, etc.

- Integration of Chrome allows the use of the Chrome Extensions API for application development.

- Reduces the set of GENIVI APIs and replaces them with standard Chrome APIs.

- Chrome and CEF can both be controlled using the simplified dbus API for window control.

Summary

- The Networking Expert Group considers Chrome and CEF as the best suitable solutions for GDP.

- Chrome offers complete browser support with JavaScript APIs where web applications require them.

- CEF provides a bare-bones HTML and JavaScript engine but without API support.

- Basic functionality can be controlled through a common dbus API.

- OEMs and Tier 1 can choose either one or both for their target platforms without GENIVI prescribing a specific solution.

Thank you!

Weekly Networking Expert Group Call

Mondays 0800 PT / 1700 CET

https://genivi.webex.com/genivi/j.php?MTID=mdb9482b92015e5cb7386c1a65e32a887

Meeting number: 579 975 193

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