



Tizen, a Wayland-powered operating system



Manuel Bachmann

[<manuel.bachmann@open.eurogiciel.org>](mailto:manuel.bachmann@open.eurogiciel.org)



Eurogiciel



Open-source development and integration :

- Maintainers for tizen.org (Base, Test, Web Framework, ... domains)
- Embedded systems for real-time multimedia :
 - Widi/Miracast stack,
 - Wayland/Weston,
 - Webkit2 browser with HW acceleration.
- Applications : HTML5/CSS3, jquery, jqmobi, Cordova
- Location : Brittany - France



Manuel Bachmann

<manuel.bachmann@open.eurogiciel.org>



- Previous maintainer of the GTK+3 for Win32 packages ;
- Author of a GLX wrapper for EGL : EGLX ⁽¹⁾ ;
- Upstream contributor to Weston, EFL, Ozone-Wayland... ;
- Maintains Weston and UI domain packages under Tizen.



Summary

- Tizen has a display system-independent build system
- Wayland and its compositors' shells :
 - XDG-Shell enhancements ;
 - IVI-Shell and friends (ICO Homescreen...);
 - Tizen API and web framework adaptations ;
 - toolkits and frameworks integration.
- The multiuser challenge
- An enforced security model for graphical applications





Tizen has a display-system independent build system



Tizen has a display system-independant build system

- Build system uses GIT along with OBS/GBS or Yocto ;
- Currently provides X86, AMD64 and ARM binary packages ;
- X11 and Wayland packages are built in two separate repositories for each architecture :
 - X11 is : Xorg-server, Enlightenment ;
 - Wayland is : Weston, tizen-launcher.
- Shared packages are : Crosswalk, AppFW (ail/aul, app-core, slp-pkgmgr, pkgmgr-info...)...
- Macros (%with_x, %with_wayland, ...) ensure consistency of the various builds.

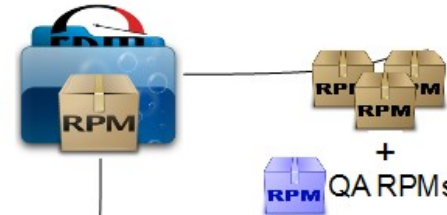
Tizen, a display system-independant build system



GIT Repositories

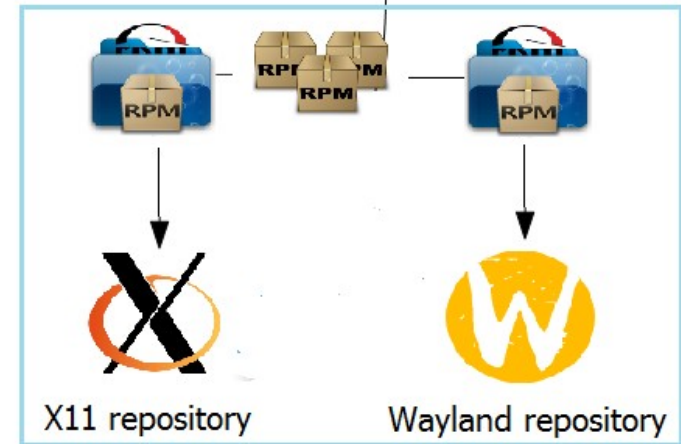


RPM Repositories



Accept build request

Build request



from Git repositories to X11/Wayland packages



What is in which Wayland profile

- Tizen Common has :
 - Patched Weston (*);
 - Crosswalk, EFL and Qt apps ;
- Tizen IVI has :
 - Patched Weston (*);
 - Embedded-oriented optimizations ;
 - Crosswalk with Modello Homescreen (web) ;
 - IVI-Shell with ICO Homescreen (native);

<DEMO TIME>

- 1) Tizen Common : Weston with tz-launcher and apps
- 2) Tizen IVI with Modello Homescreen
- 3) Tizen IVI with ICO Homescreen



Wayland shells, Tizen API and framework integration

CROSSWALK



CROSSWALK

XDG-Shell

- Upstream, still work-in-progress (stable version in Weston 1.7.0 ?)
 - used by the Crosswalk web framework and Tizen extensions to provide Tizen API functionalities :
 - *tizen.application.hide()* is mapped to *xdg_surface_set_minimized()* ;
 - *tizen.application.launch()*, on an already started application, will resume it and bring it to foreground with *xdg_surface_present()* (Tizen patch);
- Hope to see *xdg_surface_present()* in the next upstream release ⁽²⁾.

<DEMO TIME>

- 1) `xdg_surface_set_minimized()` in a test app
- 2) `xdg_surface_present()` implementation demo
- 3) Tizen Common with test app and `hide()/launch()`
- 4) Tizen IVI with Modello Homescreen and `hide()/launch()`



IVI-Shell

- In review process upstream, hope to see it in Weston 1.7.0 ;
- Provides a Weston shell interface compliant with the GENIVI specification (<http://www.genivi.com>) ;
- Present only on Tizen IVI, used by the ICO Homescreen ;
- We maintain an external Weston Git repository with patches applied for reviewers ⁽³⁾, and build it as a separate plugin under Tizen ;
- Compatibility layer with XDG-Shell, so that standard applications can use it, has been proven possible and is currently being done ⁽⁴⁾.

<DEMO TIME>

- 1) Tizen IVI with IVI-Shell and XDG-Shell compat demo



Frameworks and toolkits integration

- Tizen API is implemented under the form of extensions for the Crosswalk web framework, and makes sure correct shell functions are called each time ;
- EFL : XDG-Shell and IVI-Shell pushed and integrated upstream ⁽⁵⁾ ;
- Qt : XDG-Shell pushed and integrated upstream by Philippe Coval, IVI-Shell under review ⁽⁶⁾ ;
- Crosswalk/Ozone-Wayland : XDG-Shell and IVI-Shell pushed and integrated upstream ⁽⁷⁾.

<DEMO TIME>

- 1) Minimization with EFL, Qt, and Chromium/Ozone-Wayland



The multiuser challenge



The multiuser challenge

- Tizen 3 is switching from a single-user approach to a multiuser one ⁽⁸⁾;



The multiuser challenge

- Tizen 3 is switching from a single-user approach to a multiuser one ⁽⁸⁾;
- The display part of the implementation will allow the application framework to position a surface on a specific screen ⁽⁹⁾ :
 - Application framework API calls and policy ;
 - possible IVI-shell use ? XDG-shell support ?



The multiuser challenge

- Tizen 3 is switching from a single-user approach to a multiuser one ⁽⁸⁾ ;
- The display part of the implementation will allow the application framework to position a surface on a specific screen (9) :
 - Application framework API calls and policy ;
 - possible IVI-shell use ? XDG-shell support ?
- Weston supports static seats configuration(with udev) – consider switching to a more dynamic approach linked to systemd and Tizen Login Manager ?

<VIDEO>

- Weston configured for multi-seat with udev



The need for an enforced security model

- An enforced security model for graphical applications



An enforced security model for graphical applications

- Tizen 3 is switching from a single-user oriented privacy-manager to Cynara ;

- An enforced security model for graphical applications



An enforced security model for graphical applications

- Tizen 3 is switching from a single-user oriented privacy-manager to Cynara ;
- When a user installs an application which requests some privileges, and Cynara is informed, how will it display actual notifications and confirmation requests to the end-user ?



An enforced security model for graphical applications

- Tizen 3 is switching from a single-user oriented privacy-manager to Cynara ;
- When a user installs an application which requests some privileges, and Cynara is informed, how will it display actual notifications and confirmation requests to the end-user ?
- A security manager sometimes needs to prevent a surface to do a specific thing without an authorization (going fullscreen, or taking a screenshot e.g.). How will this be implemented compositor-side ?



An enforced security model for graphical applications

- Tizen 3 is switching from a single-user oriented privacy-manager to Cynara ;
- When a user installs an application which requests some privileges, and Cynara is informed, how will it display actual notifications and confirmation requests to the end-user ?
- A security manager sometimes needs to prevent a surface to do a specific thing without an authorization (going fullscreen, or taking a screenshot e.g.). How will this be implemented compositor-side ?
- How that relates to Wayland Security Module.

<DEMO>

- UI pop-notification in Tizen
- Requests for privileges (taking a screenshot)

Links



- ⁽¹⁾ : EGLX GitHub repository : <https://github.com/Tarnyko/EGLX>
- ⁽²⁾ : xdg_surface_present() implementation demo :
<http://lists.freedesktop.org/archives/wayland-devel/2014-July/016224.html>
- ⁽³⁾ : weston-ivi-shell upstream adaptation GitHub repository :
<https://github.com/Tarnyko/weston-ivi-shell>
- ⁽⁴⁾ : ivi-shell xdg-shell compatibility layer feasibility :
<https://www.mail-archive.com/ivi@lists.tizen.org/msg02702.html>
- ⁽⁵⁾ : EFL upstream wayland shells :
<http://git.enlightenment.org/core/efl.git/commit/?id=87f02170e659678d7a2f000e6850>
- <https://git.enlightenment.org/core/efl.git/commit/?id=50287ab731d4d87170238b365203e830edc038d5>

Links (2)

- ⁽⁶⁾ : Qt upstream wayland shells :
<https://bugreports.qt-project.org/browse/QTBUG-38633> - <https://bugreports.qt-project.org/browse/QTBUG-41172>
- ⁽⁷⁾ : Ozone-Wayland upstream wayland shells :
<https://github.com/01org/ozone-wayland/commit/5f8a34c613ba826c7994c81d03f87df>
-
<https://github.com/01org/ozone-wayland/commit/a034a018b6ec317ec5559dcce6efec9>
- ⁽⁸⁾ : Tizen multi-user architecture :
https://wiki.tizen.org/wiki/Multi-user_Architecture
- ⁽⁹⁾ : Tizen multi-user display management :
https://wiki.tizen.org/wiki/Multi-user_DisplayManagement

Q&A

That's all folks !

That's all folks !

