



Tizen Platform SDK: The Easy Way to Develop Tizen Platform

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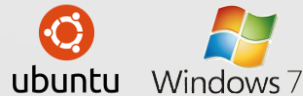
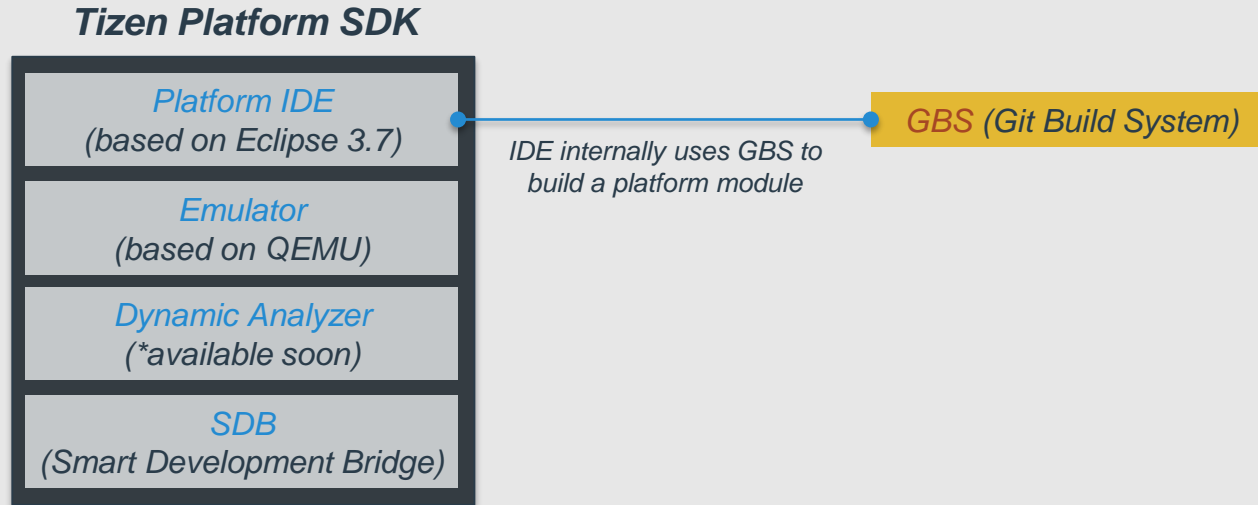
- **Introduction**
- **Key features (with demo)**
- **Upcoming features**
- **Conclusion**
- **Q&A**

Introduction



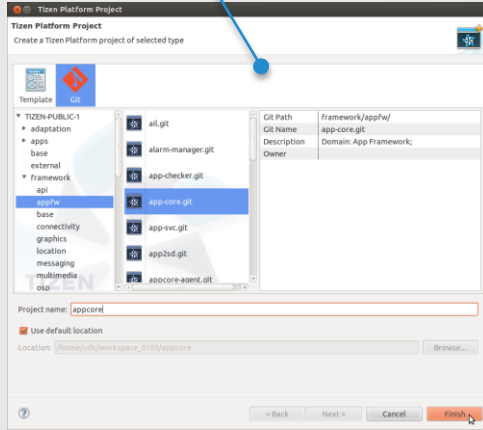
What is Tizen Platform SDK?

- Development kit to develop Tizen platform module



Platform IDE

Clone source and create project with project wizard



Manage resources

Manage emulator and target

Build



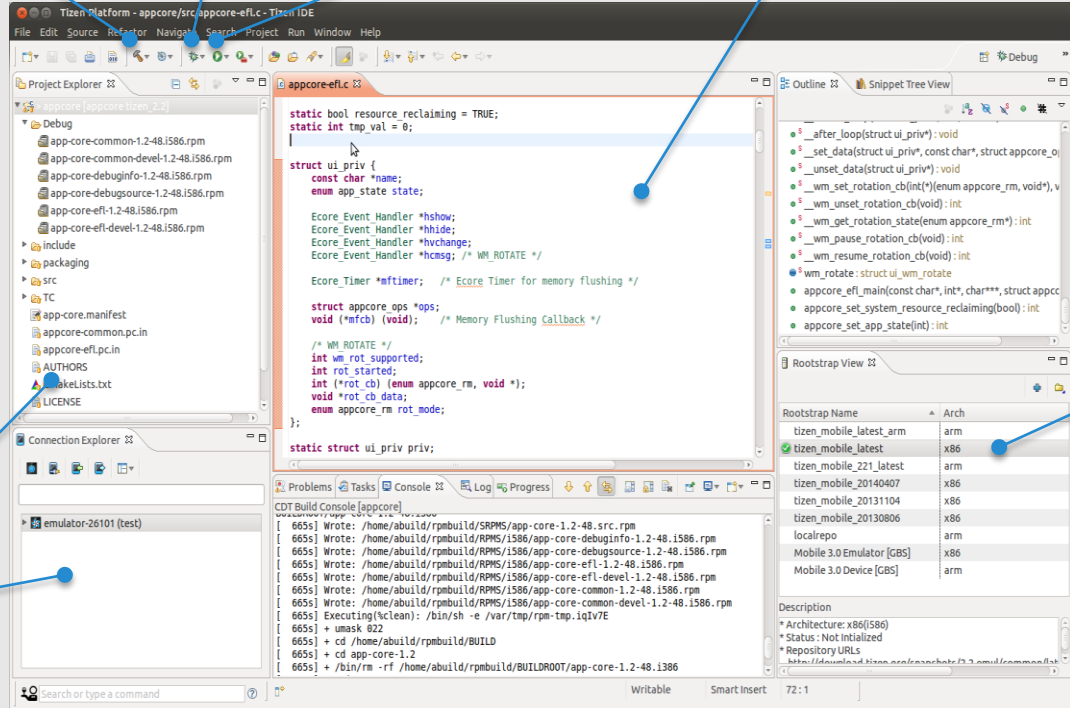
Debug



Run



Edit sources

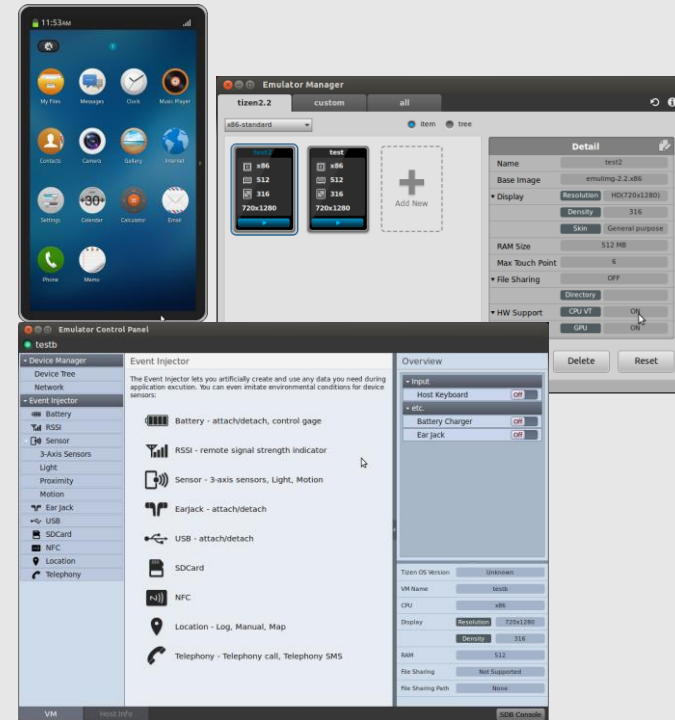


Manage Rootstraps

Emulator

- **Features**

- Providing full system emulation, include CPU, memory and peripheral devices
- Simulating events with the Emulator Control Panel
- Accelerating guest operations using host CPU and GPU



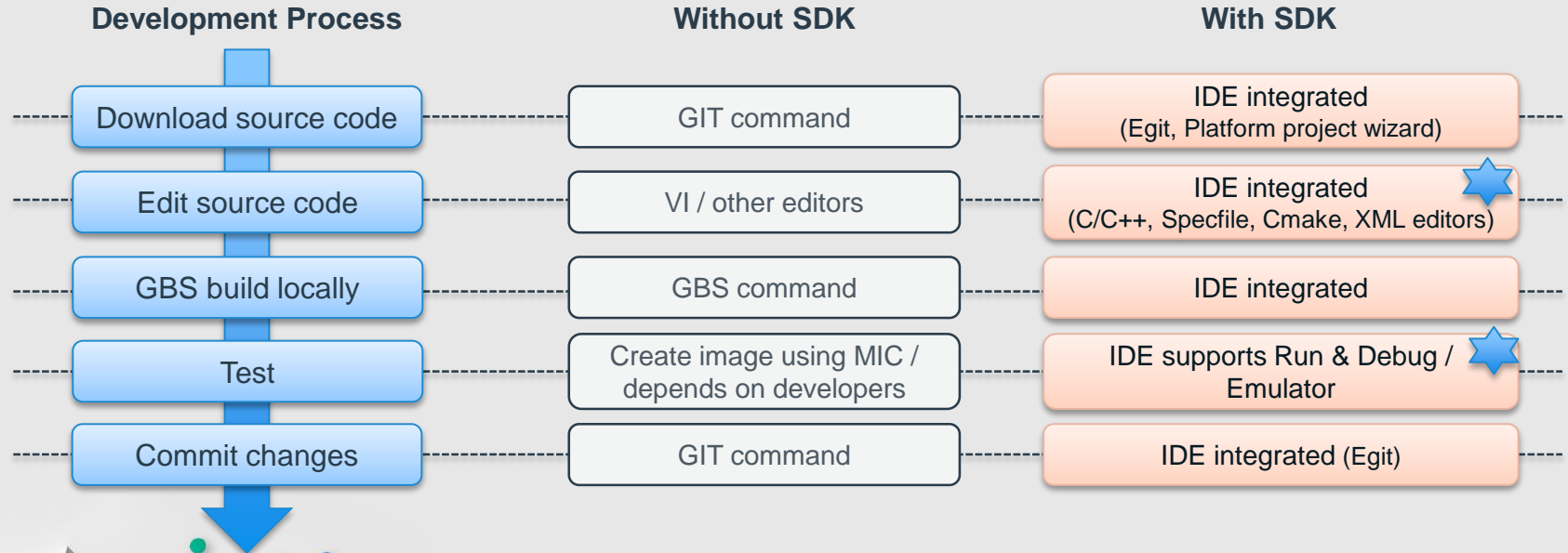
SDB (Smart Development Bridge)

- SDB is device management tool
 - It manages multiple device connections
 - It supplies basic commands for development
 - File transfer
 - Remote shell
 - Port forwarding for a debugger
 - Device log output
 - Connect remote device

```
commands:
sdb root <on | off> - switch to root or developer account mode
                    'on' means to root mode, and vice versa
sdb status-window - continuously print device status for a specified device
sdb get-serialno - print: <serial-number>
sdb get-state - print: offline | locked | device
sdb kill-server - kill the server if it is running
sdb start-server - ensure that there is a server running
sdb version - show version num
sdb help - show this help message
sdb forward <local> <remote> - forward socket connections
                             For example: sdb forward tcp:9999 tcp:9999
sdb uninstall <pkg_id> - uninstall an app from the device
                       the <pkg_id> is an unique 10-digit unique identifier for the application. The
following command shows an example:
                       Ex.) sdb uninstall ko983dw33q
sdb install <pkg path> - push package file and install it
sdb dlog [<filter spec>] - view device log
sdb shell [command] - if argument is null, run remote shell interactively
                    if argument is not null, run command in the remote shell
sdb pull <remote> [<local>] - copy file/dir from device
sdb push <local> <remote> [--with-utf8] - copy file/dir to device
                                       (--with-utf8 means to create the remote file with utf-8 character encoding)
sdb disconnect [<host>[:<port>]] - disconnect from a TCP/IP device
                                  port 26101 is used by default if no port number is specified
                                  using this command with no additional arguments
                                  will disconnect from all connected TCP/IP devices
sdb connect <host>[:<port>] - connect to a device via TCP/IP
                             port 26101 is used by default if no port number is specified
sdb devices - list all connected devices
```


Why use Tizen Platform SDK?

- It makes platform module development easier



Key features of Platform IDE

- **Visual & Easy Editing**
- **Build based on Rootstrap**
- **Easy Testing (Run & Debug)**
- **Quick Launch (RDS)**
- **Platform Crash Analysis (Core dump debug)**
- **Easy Package Management (Package Manager)**

Key features



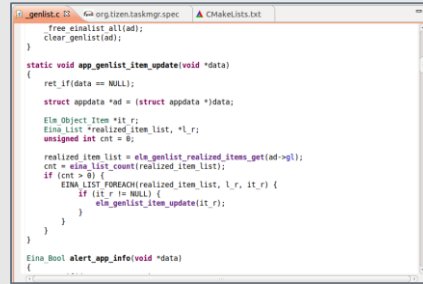
Visual & Easy Editing

- **Editors**

- C/C++ Editor
- Spec File Editor
- CMake Editor
- XML Editor

- **Features**

- Highlighting, Content assist
- Open declaration, Hover
- Outline view



```
free eadlist all(ad);
Clear_genlist(ad);

static void app_genlist_item_update(void *data)
{
    ret_if(data == NULL);

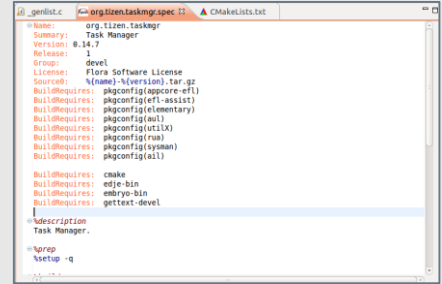
    struct appdata *ad = (struct appdata *)data;

    Eina_Object_Item *it_r;
    Eina_List *realized_item_list = *_l_r;
    unsigned int cnt = 0;

    realized_item_list = eina_genlist_realized_items_get(ad->gl);
    cnt = eina_list_count(realized_item_list);
    if (cnt > 0) {
        EINA_LIST_FOREACH(realized_item_list, _l_r, it_r) {
            if (it_r != NULL) {
                eina_genlist_item_update(it_r);
            }
        }
    }

    Eina_Bool alert_app_info(void *data)
    {
```

C/C++ Editor



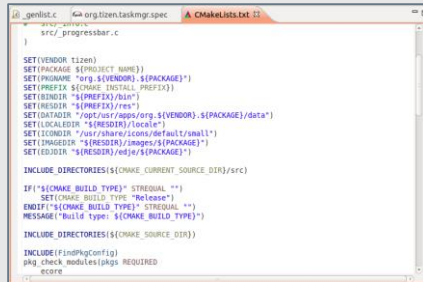
```
@Name: org.tizen.taskmgr
Summary: Task Manager
Version: 0.14.7
Release: 1
Group: devel
License: Flora Software License
Source0: %{name}-%{version}.tar.gz
BuildRequires: pkgconfig(opencore-efl)
BuildRequires: pkgconfig(efl-webkit)
BuildRequires: pkgconfig(elementary)
BuildRequires: pkgconfig(aal)
BuildRequires: pkgconfig(otix)
BuildRequires: pkgconfig(real)
BuildRequires: pkgconfig(syman)
BuildRequires: pkgconfig(aal)

BuildRequires: cmake
BuildRequires: edje-bin
BuildRequires: embryo-bin
BuildRequires: gettext-devel

%description
Task Manager.

%prep
%setup -q
```

Specfile Editor



```
SET(VENDOR tizen)
SET(PACKAGE ${PROJECT_NAME})
SET(PROJNAME "org.${VENDOR}.${PACKAGE}")
SET(PREFIX ${CMAKE_INSTALL_PREFIX})
SET(BINDIR "${PREFIX}/bin")
SET(INCLUDEDIR "${PREFIX}/res")
SET(DATADIR "${optusr/apps/org.${VENDOR}.${PACKAGE}/data")
SET(LOCALIZEDIR "${PREFIX}/locale")
SET(ICONDIR "${usr/share/icons/default/small}")
SET(IMAGEDIR "${PREFIX}/images/${PACKAGE}")
SET(ICONDIR "${PREFIX}/icons/${PACKAGE}")

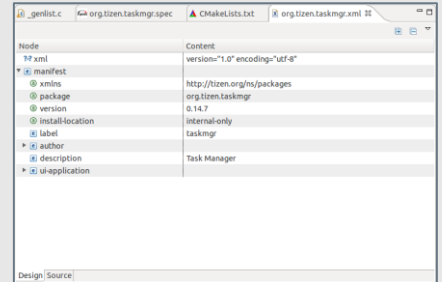
INCLUDE_DIRECTORIES(${CMAKE_CURRENT_SOURCE_DIR}/src)

IF("${CMAKE_BUILD_TYPE}" STREQUAL "")
SET(CMAKE_BUILD_TYPE "Release")
ENDIF("${CMAKE_BUILD_TYPE}" STREQUAL "")
MESSAGE("Build type: ${CMAKE_BUILD_TYPE}")

INCLUDE_DIRECTORIES(${CMAKE_SOURCE_DIR})

INCLUDE(${findpkgConfig})
pkg_check_modules(PKG_REQUIRED
score
```

CMake Editor



Node	Content
xml	version="1.0" encoding="utf-8"
manifest	
xmlns	http://tizen.org/ns/packages
package	org.tizen.taskmgr
version	0.14.7
install-location	internal-only
label	taskmgr
author	
description	Task Manager
application	

XML Editor

Build based on Rootstrap

- **What is Rootstrap?**


- All required tools, libraries and include files for building a platform project
- User creates multiple Rootstraps based on platform version and snapshot and can try to build platform module based on it.

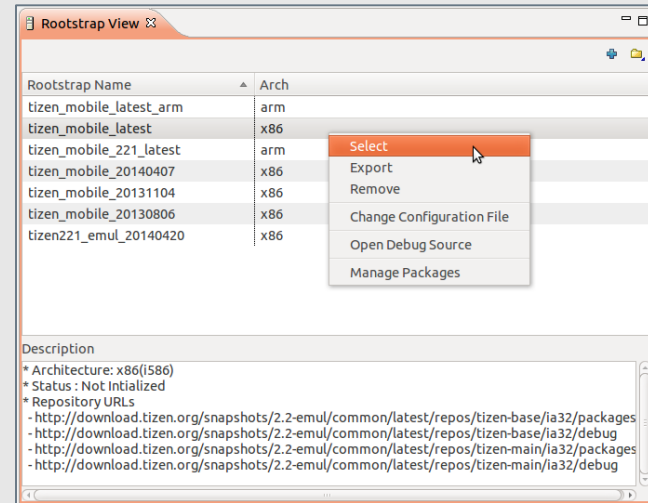
```
/home/sdk/tizen-sdk-data/user-rootstraps/  
├── tizen_mobile_20131104  
├── tizen_mobile_20131104_arm  
├── tizen_mobile_20140407  
├── tizen_mobile_20140407_arm  
├── tizen_mobile_221_20140420  
├── tizen_mobile_221_latest  
├── tizen_mobile_latest  
└── tizen_mobile_latest_arm
```

```
tizen_mobile_latest  
├── local  
└── BUILD-ROOTS  
    └── scratch.i586.0  
        ├── bin  
        ├── boot  
        ├── dev  
        ├── etc  
        ├── home  
        ├── installed-pkg  
        ├── lib  
        ├── media  
        ├── mnt  
        ├── opt  
        ├── proc  
        ├── root  
        ├── run  
        ├── sbin  
        ├── smack  
        ├── srv  
        ├── sys  
        ├── tmp  
        ├── usr  
        └── var
```


Build based on Rootstrap

- **How to build a platform project**

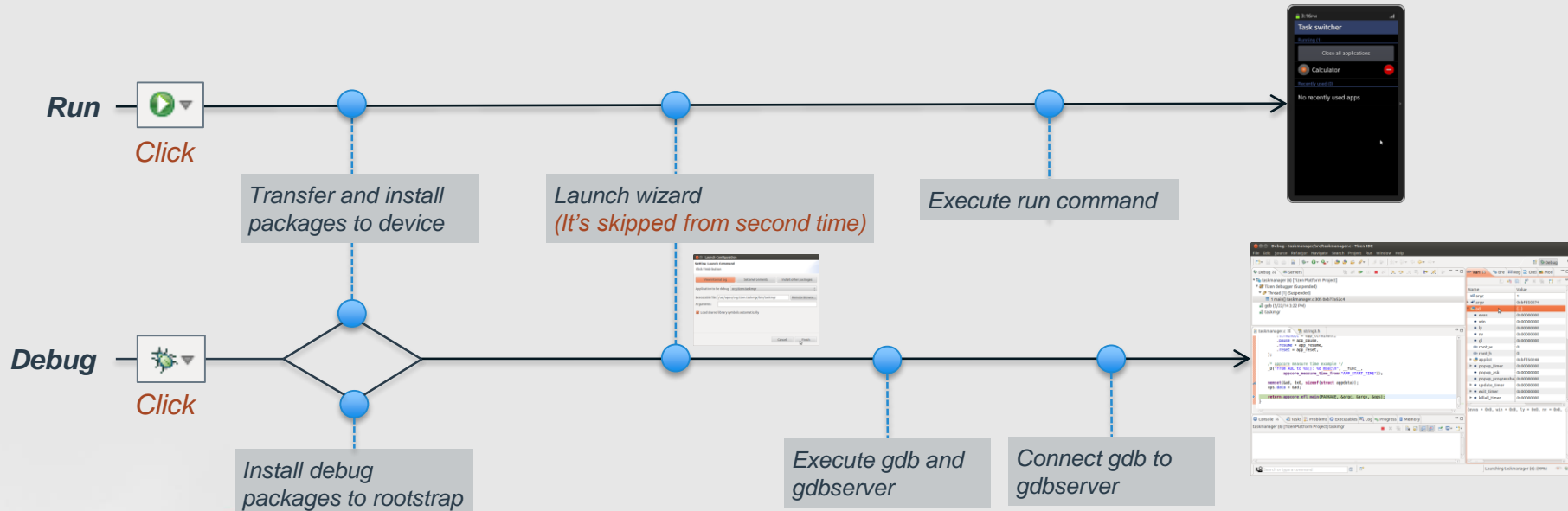
- 1 Select a project
- 2 Select a Rootstrap on Rootstrap View
- 3 Click build icon 



Demo (Create a Rootstrap & Build)

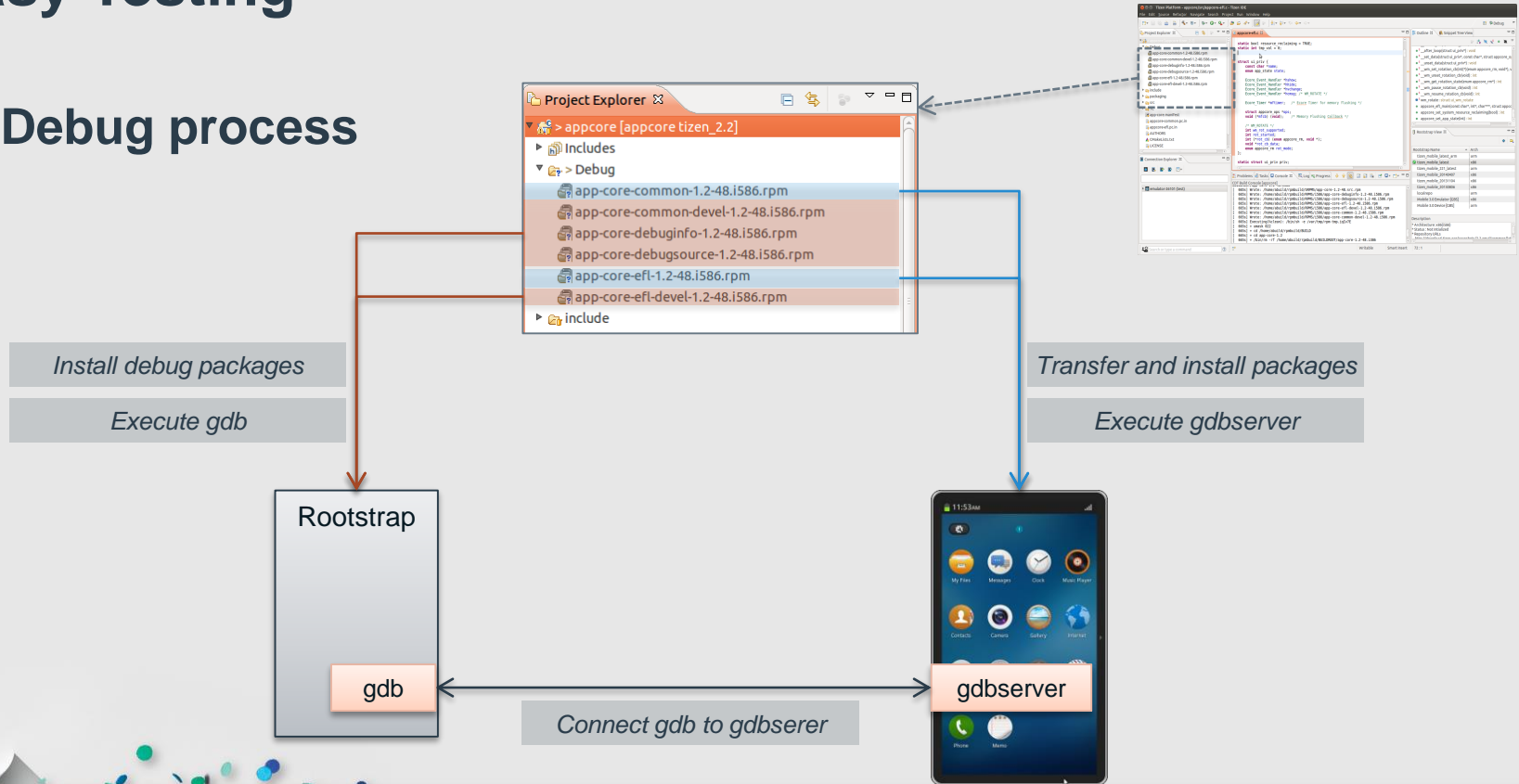
Easy Testing (Run & Debug)

- IDE provides a simple way to test platform module



Easy Testing

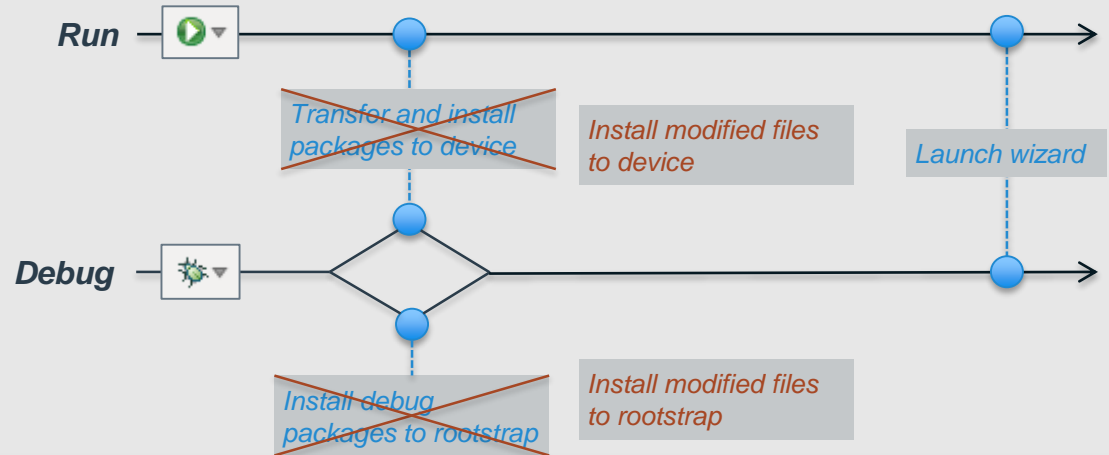
- Debug process



Demo (Run & Debug)

Quick Launch (RDS)

- RDS lets you develop a platform module rapidly by saving deployment time.
- After the first launching, rpm transfer and install process is skipped and only modified files are installed in the target.



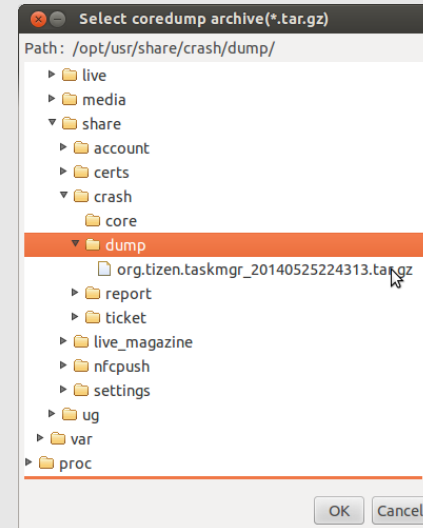
Quick Launch

- **Performance**

- It depends on number of modified files.
- In case of Debugging, **launch time is reduced by more 74.27%**
 - It has a good effect because package installation time for Rootstrap greatly reduce.
- In case of Running, **launch time is reduced by more 12.4%**
 - It has an issue that launch time is increased if modified files are many.
 - RDS is not operated if modified files are more than 20.

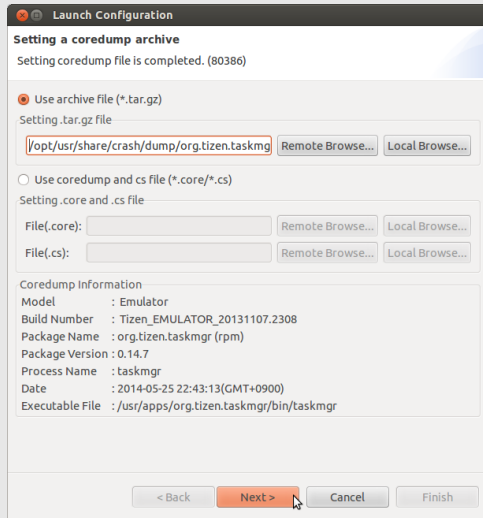
Platform Crash Analysis (Core dump debug)

- **IDE provides feature to debug dump file**
 - To debug core dump
 - Debug As > Tizen Platform Project – Coredump
- **The needs for debugging core dump**
 - Snapshot information of target image
 - Core dump files (/opt/usr/share/crash/)
 - *.tar.gz
 - *.core / *.cs

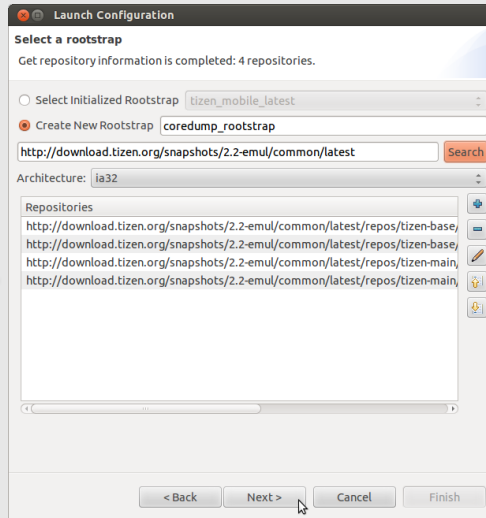


Platform Crash Analysis

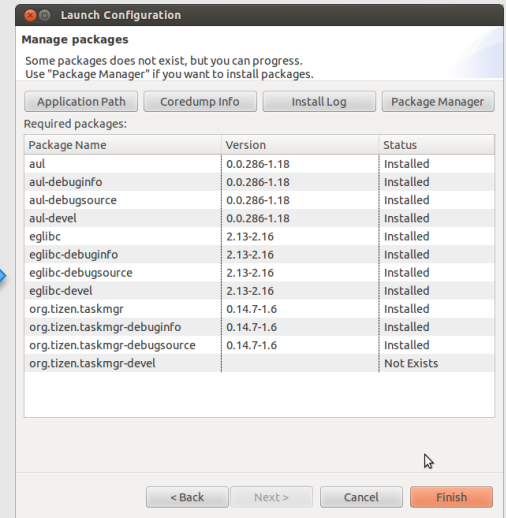
- Launch wizard



Set core dump files



Set Rootstrap. Packages for debugging are installed to Rootstrap automatically



Check installed packages and install additional packages if it is needed

Platform Crash Analysis

taskmgr (8) [Tizen Platform Project - Coredump]
Tizen debugger (Suspended)
Thread [1] (Suspended)
23 response_end_inuse() _genlist.c:675 0xb71d19a9
22 _ok_response_cb() _logic.c:319 0xb71d3ea4
21 evas_object_smart_callback_call() evas_object_smart.c:610 0xb6df09e2
20 _activate() elm_button.c:62 0xb704cdf6
19 edje_match_callback_exec_check_finals() edje_match.c:500 0xb6cb5240
18 edje_match_callback_exec() edje_match.c:658 0xb6cb5240
17 _edje_emit_cb() edje_program.c:1319 0xb6cb3372
16 _edje_emit_handle() edje_program.c:1321 0xb6cb3372

```
int response_end_inuse(struct appdata *ad)
{
    D("func\n");
    Eina_List *l, *l_next;
    struct task_info *info;
    Eina_Bool dead = EINA_FALSE;

    int *p = 0;
    *p = 1;

    retvm_if(ad == NULL, -1, "Invalid argument: appdata is NULL\n");
    ad->ending = EINA_TRUE;

    EINA_LIST_FOREACH_SAFE(ad->applist[75 INUSE], l, l_next, info) {
        D("applist pid : %d", info->pid);
        if (info->it == g_egl) {
            0"matched applist pid : %d", info->pid);
            if (info->pid > 0) {
                if (aull_terminate_pid(info->pid) < 0) {
                    kill(info->pid, SIGKILL);
                }
            }
        }
    }
}
```

```
675:  movl $0x1,0x0
676:  retvm_if(ad == NULL, -1, "Invalid argum
677:  test %esi,%esi
678:  je 0xb71d1b40 <-response_end_inuse+528>
679:  ad->ending = EINA_TRUE;
680:  mov 0x0(%ebp),%edx
681:  EINA_LIST_FOREACH_SAFE(ad->applist[TS_I
682:  mov 0x1c(%edx),%eax
683:  ad->ending = EINA_TRUE;
684:  movl $0x1,0x48(%edx)
685:  add %eax,%eax
686:  add %al,%eax
687:  test %eax,%eax
688:  je 0xb71d1a42 <-response_end_inuse+274>
689:  mov 0x4(%eax),%esi
690:  EINA_LIST_FOREACH_SAFE(ad->applist[TS_I
691:  mov (%eax),%edi
692:  lea -0x290c(%ebx),%eax
693:  mov %eax,-0x2c(%ebp)
694:  jmp 0xb71d19e5 <-response_end_inuse+181>
695:  lea 0x0(%esi,%eiz,1),%esi
696:  mov (%esi),%edi
697:  mov 0x4(%esi),%esi
698:  D("applist pid : %d", info->pid);
699:  mov 0xc(%edi),%eax
700:  mov -0xc(%ebp),%edx
701:  movl $0x2aa,0x20(%esp)
702:  movl $0x2aa,0x18(%esp)
703:  mov %eax,0x24(%esp)
704:  mov -0x28(%ebp),%eax
705:  mov %edx,0xc(%esp)
706:  mov -0x24(%ebp),%edx
```

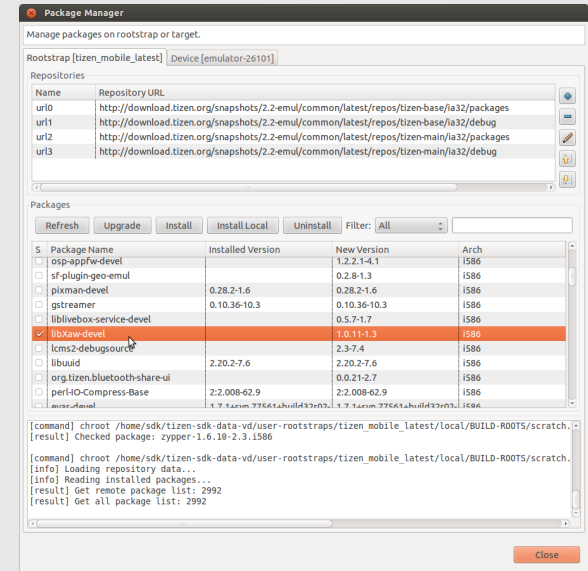
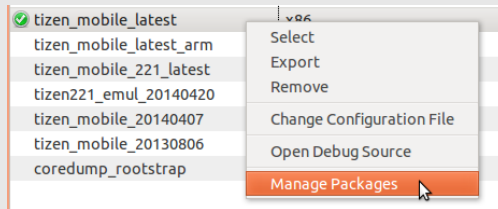
```
taskmgr (8) [Tizen Platform Project - Coredump] gdb (11/25/13 10:55 AM)
173^done,value="cvalue optimized out"
(gdb)
174-var-create * * dead
174^done,name="var13",numchild=0,value=0 '\\000',type="Eina_Bool",thread-id=1,has_more=0"
(gdb)
175-var-evaluate-expression var13
175^done,value=0 '\\000"
(gdb)
```

Demo (Core dump debug)

Easy Package Management (Package Manager)

- **Package Manager**

- It provides features to manage package of Rootstrap and target.
 - Add / Remove / Modify repository
 - Install / Uninstall / Upgrade package
- To run Package Manager
 - 1 Select a Rootstrap on Rootstrap View
 - 2 Click Manage Packages from the context menu



Easy Package Management

Rootstrap & Device tab

Repository list

Package list

Command log view

Package Manager

Manage packages on rootstrap or target.

Rootstrap [tizen_mobile_latest] Device [emulator-26101]

Repositories

Name	Repository URL
url0	http://download.tizen.org/snapshots/2.2-emul/common/latest/repos/tizen-base/ia32/packages
url1	http://download.tizen.org/snapshots/2.2-emul/common/latest/repos/tizen-base/ia32/debug
url2	http://download.tizen.org/snapshots/2.2-emul/common/latest/repos/tizen-main/ia32/packages
url3	http://download.tizen.org/snapshots/2.2-emul/common/latest/repos/tizen-main/ia32/debug

Packages

Refresh Upgrade Install Install Local Uninstall Filter: All

S	Package Name	Installed Version	New Version	Arch
<input type="checkbox"/>	osp-appfw-devel		1.2.2-1-4.1	i586
<input type="checkbox"/>	sf-plugin-geo-emul		0.2.8-1.3	i586
<input type="checkbox"/>	pixman-devel	0.28.2-1.6	0.28.2-1.6	i586
<input type="checkbox"/>	gstreamer	0.10.36-10.3	0.10.36-10.3	i586
<input type="checkbox"/>	liblivebox-service-devel		0.5.7-1.7	i586
<input checked="" type="checkbox"/>	libXaw-devel		1.0.11-1.3	i586
<input type="checkbox"/>	lcms2-debugsource		2.3-7.4	i586
<input type="checkbox"/>	libuuid	2.20.2-7.6	2.20.2-7.6	i586
<input type="checkbox"/>	org.tizen.bluetooth-share-ui		0.0.21-2.7	i586
<input type="checkbox"/>	perl-IO-Compress-Base	2:2.008-62.9	2:2.008-62.9	i586
<input type="checkbox"/>	perl-devel	1:7.14.0-775614-build23r02	1:7.14.0-775614-build23r02	i586

```
[command] chroot /home/sdk/tizen-sdk-data-vd/user-rootstraps/tizen_mobile_latest/local/BUILD-ROOTS/scratch.  
[result] Checked package: zypper-1.6.10-2.3.i586  
  
[command] chroot /home/sdk/tizen-sdk-data-vd/user-rootstraps/tizen_mobile_latest/local/BUILD-ROOTS/scratch.  
[info] Loading repository data...  
[info] Reading installed packages...  
[result] Get remote package list: 2992  
[result] Get all package list: 2992
```

Close

Add repository
Remove repository
Modify repository
Set priority of repository

Refresh package list
Upgrade packages
Install remote package
Install local package
Uninstall package

Other features of Platform IDE

- **Multi device management** (Connection Explorer)
- **Build configuration** (Debug/Release)
- **Tool command management** (GBS/rpm/zypper/pkgcmd)
- **Profiling** (Oprofile/Valgrind)
- **Remote development environment on Windows**

Upcoming features

- **Supporting Mac OS and other Linux distribution**
- **Build speed improvement**
 - Divide into build and packaging step
 - Supporting Predictive build
- **Supporting Attach debugging**

Conclusion

- **Tizen Platform SDK allows you to develop platform module easily and quickly**
- **Effective cases:**
 - If you develop platform application or library
 - If you need to debug core dump
 - If you are new platform developer