



Android Application Development – A Kickstart

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Agenda

- ▶ Introduction
- ▶ Why Android
- ▶ Android Development – How to

Phones and Smartphones





Operating System?

- ▶ Windwos
- ▶ Linux
- ▶ Mac
- ▶ Symbian
- ▶ Windows–Mobile
- ▶ BlackBerry OS
- ▶ **Android!**

Why Android?



Mobile OS

Google



Android Facts!

- ▶ Linux based open source OS
- ▶ Supported by Google and Open Handset Alliance
- ▶ Java programming for developers
- ▶ Already 15 phones available



Local Android Development Efforts

Who we are?



Mobile apps @



Pepper.pk

Android Development

Android Architecture



Applications
Built-in (phone, contacts, browser), Third-party/Custom

Application frameworks
Telephone Mgr, Location Mgr, Notification Mgr, Content providers, Windowing, Resource Mgr, etc.

Libraries
Graphics, media, database, WebKit, etc.

Android runtime
Dalvik Virtual Machine

Linux Kernel
Power, File system, drivers, process, management, etc.



Application Framework

- ▶ Developers
 - can build extremely rich and innovative applications
 - have full access to framework APIs



Application Framework

- ▶ Underlying all applications is a set of services and systems, including:
 - Views
 - Content Providers
 - Resource Manager
 - Notification Manager
 - Activity Manager



Application Components

- ▶ no main() function
- ▶ There are four types of components:
 - Activities
 - Services.
 - Broadcast Receivers
 - Content providers



Development Kickstart

▶ Step 1 – Downloads:

- Eclipse

<http://www.eclipse.org/downloads/>

- Android SDK

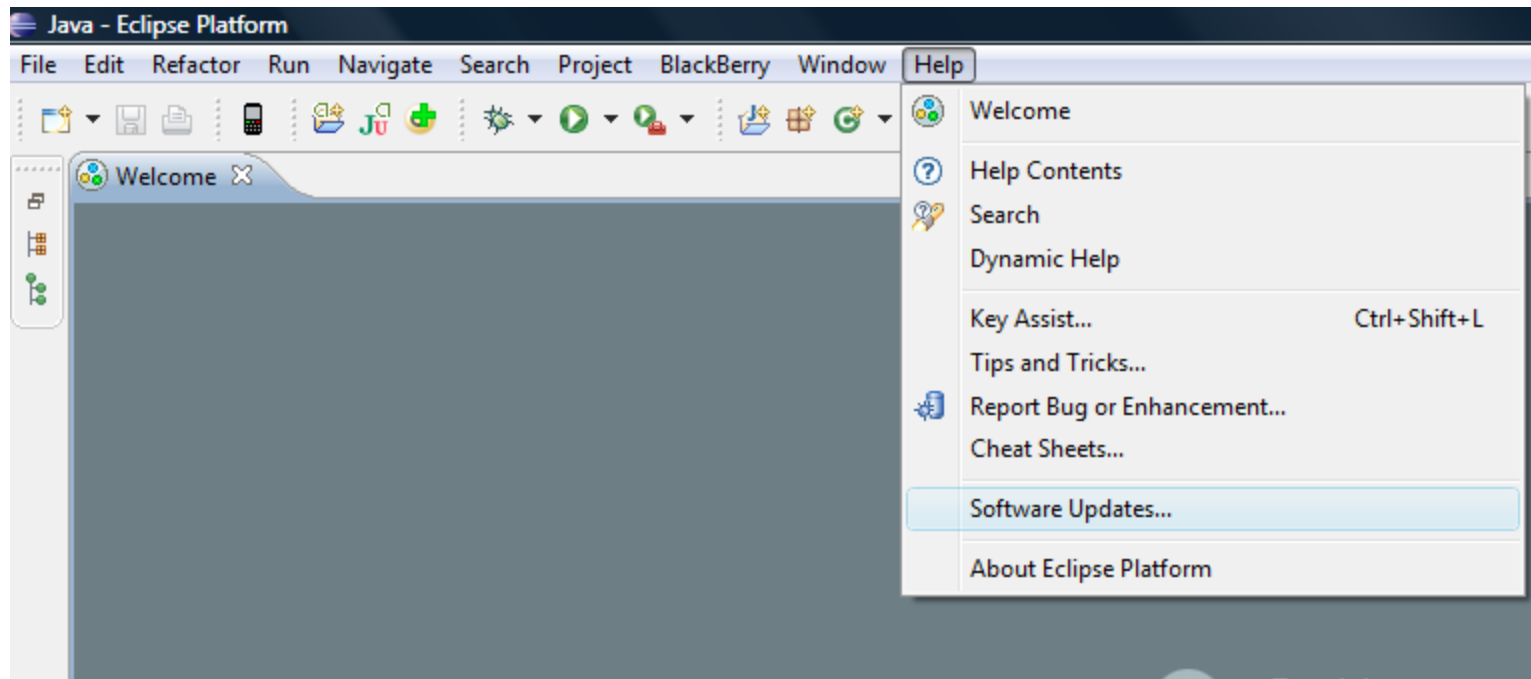
<http://developer.android.com/sdk/>



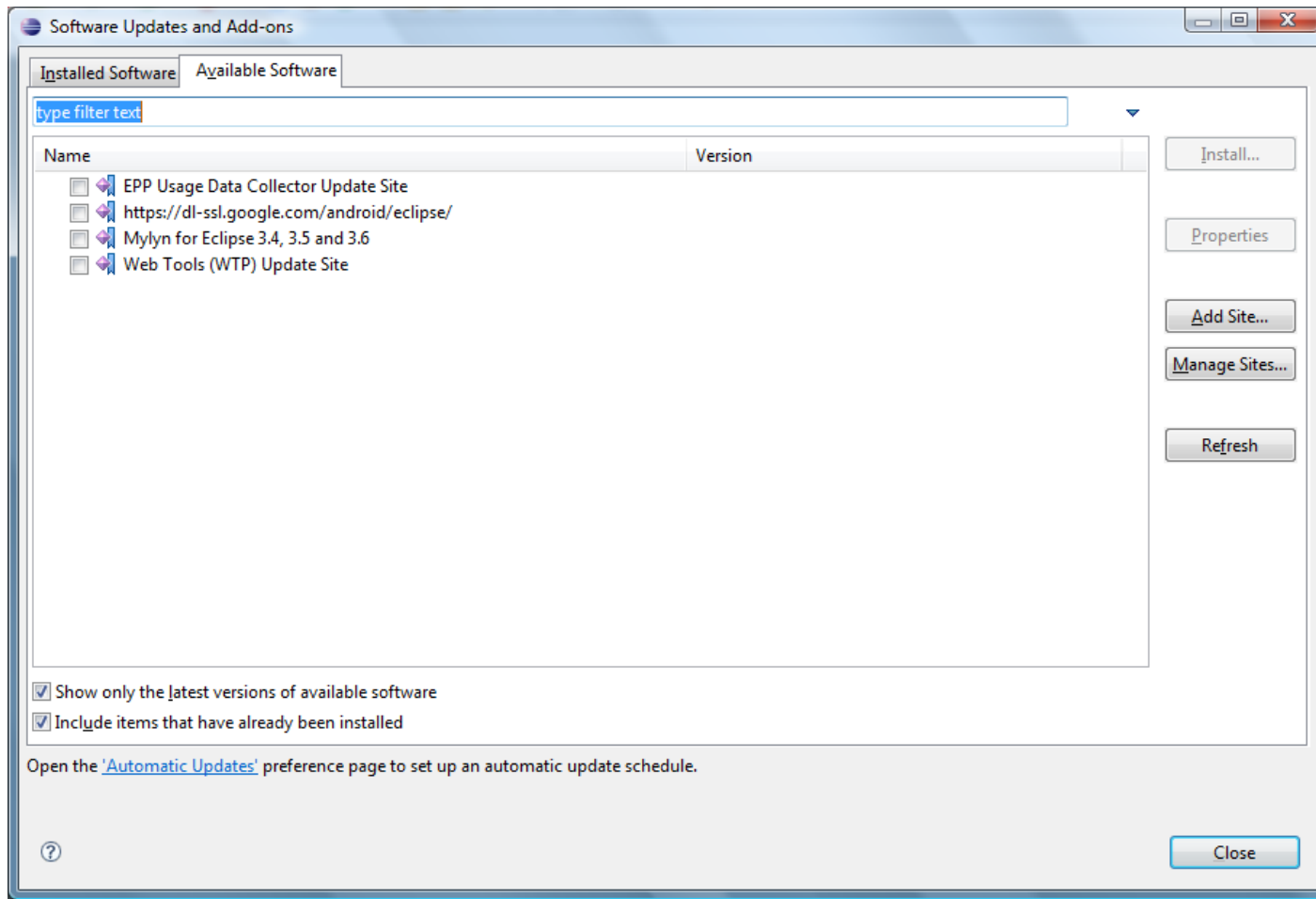
Development Kickstart

- ▶ **Step 2 – Configure Eclipse and SDK**
- ▶ This includes
 - Configure Eclipse Plugin for Android
 - Configure SDK with Eclipse

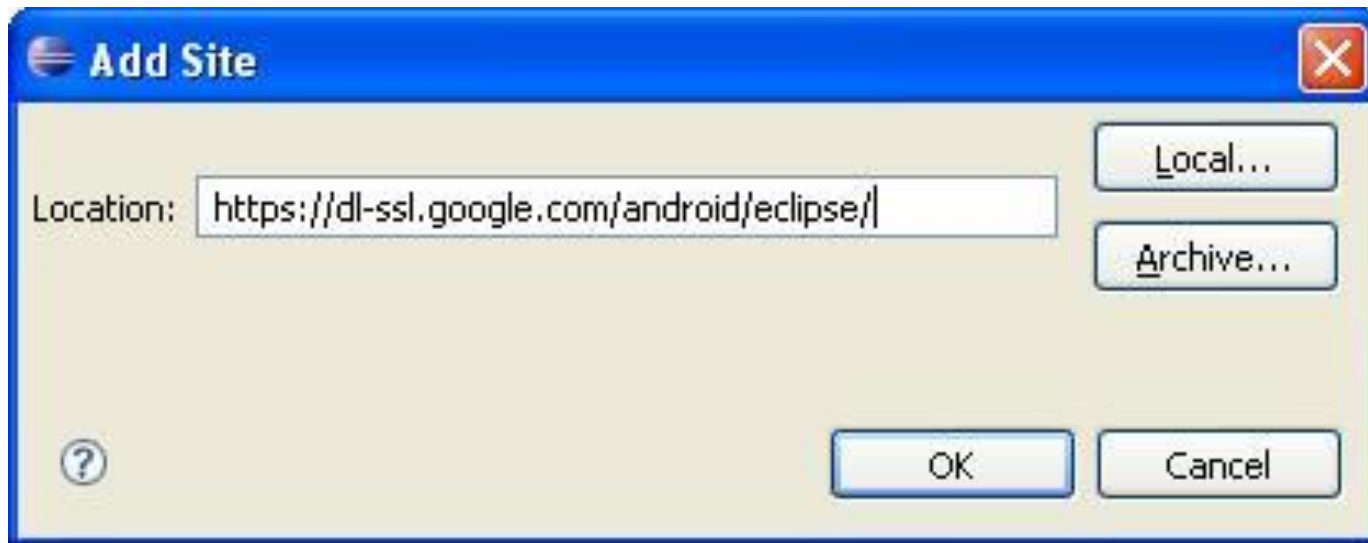
Configure Eclipse Plugin – Step 1



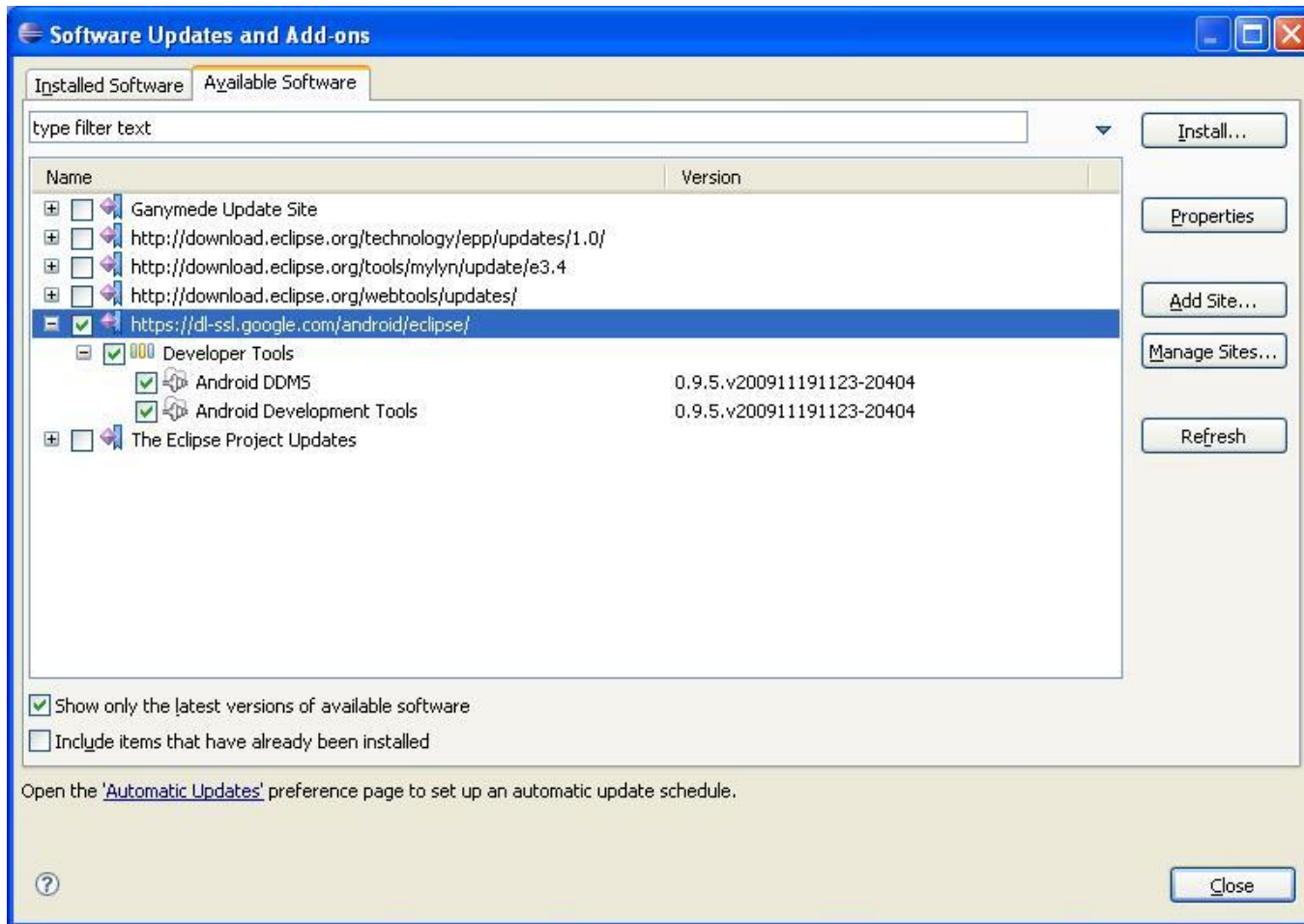
Configure Eclipse Plugin Step-2



Configure Eclipse Plugin – Step 3



Configure Eclipse Plugin – Step 4



Configure Android SDK



Preferences

type filter text

General
Android
Build
DDMS
Launch
LogCat
Usage Stats
Ant
BlackBerry JDE
Help
Install/Update
Java
Run/Debug
Tasks
Team
Usage Data Collector
Validation
XML

Android

Android Preferences

SDK Location: F:\Android\android-sdk-windows-1.6_r1 Browse...

Note: The list of SDK Targets below is only reloaded once you hit 'Apply' or 'OK'.

Platform	API...
1.1	2
1.5	3
1.6	4
2.0	5
1.5	3
1.6	4
2.0	5

Browse For Folder

Folder: android-sdk-windows-1.6_r1

Make New Folder OK Cancel

Restore Defaults Apply

OK Cancel

Hello world example



User Interface

- ▶ The **View** class serves as the base for subclasses called "widgets".
- ▶ The **ViewGroup** class serves as the base for subclasses called "layouts".



Common Layout Objects

Class	Description
FrameLayout	Layout that acts as a view frame to display a single object.
Gallery	A horizontal scrolling display of images, from a bound list.
GridView	Displays a scrolling grid of m columns and n rows.
LinearLayout	A layout that organizes its children into a single horizontal or vertical row. It creates a scrollbar if the length of the window exceeds the length of the screen.
ListView	Displays a scrolling single column list.
RelativeLayout	Enables you to specify the location of child objects relative to each other
TableLayout	A tabular layout with an arbitrary number of rows and columns, each cell holding the widget of your choice.



Declaring a Layout

```
▶ <?xml version="1.0" encoding="utf-8"?>
  <LinearLayout xmlns:android=
    "http://schemas.android.com/apk/res/android"
      android:layout_width="fill_parent"
      android:layout_height="fill_parent"
      android:orientation="vertical" >
    <TextView android:id="@+id/text"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Hello, I am a TextView" />
    <Button android:id="@+id/button"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Hello, I am a Button" />
  </LinearLayout>
```



Menus

- ▶ **Options Menu**
 - Icon Menu
 - Expanded Menu
- ▶ **Context Menu**
- ▶ **Submenu**



Dialogs

- ▶ A small window that appears in front of the current Activity
 - Alert Dialog
 - Progress Dialog
 - DatePicker Dialog
- ▶ Custom dialog
 - create your own layout for the dialog window with layout and widget elements.
- ▶ **Toast Notification** is a message that pops up on the surface of the window



Security and Permissions

- ▶ Android is a multi-process system
- ▶ Most security is enforced at the process level
- ▶ All Android applications (.apk files) must be signed
- ▶ By default, no permissions are associated with it.
- ▶ **AndroidManifest.xml** file can be used to define permissions.



Maps and Locations

- ▶ Location services supported by the device can be gained through the classes in the **android.location** package.
- ▶ **LocationManager** is the central component of the location framework
- ▶ **getSystemService(Context.LOCATION_SERVICE)**



Publish Applications

- ▶ All applications *must* be signed.
- ▶ Use self-signed certificates to sign applications.
- ▶ Standard tools — Keytool and Jarsigner



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