

Building Native Apps on BlackBerry 10

Shadab Rashid

Application Development Consultant
Developer Relations

Jan 14th, 2013

Agenda

- BlackBerry 10 Overview
- Native/Cascades Development
- Resources / Getting started
- Lots of Sample apps
- Q&A



BlackBerry 10™



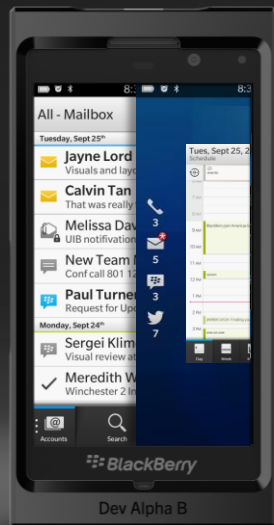
Integrated



Social



Beautiful

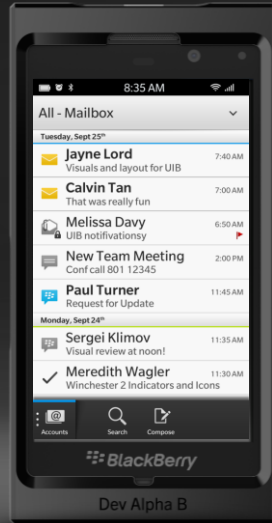


Beautiful
Flow



Social Connected Apps Share Framework





Integrated Unified Inbox

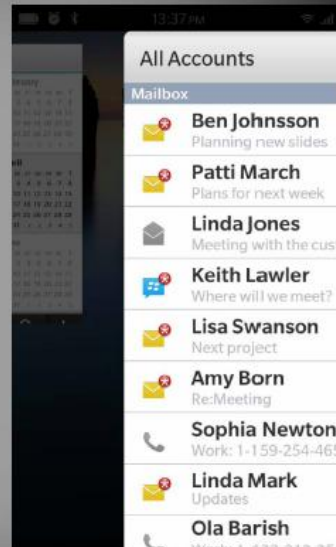
IT GLANCES

Lets you keep
an eye on what's happening.

Peek from wherever you are

Content always on the foreground

Active thumbnails showing app
context



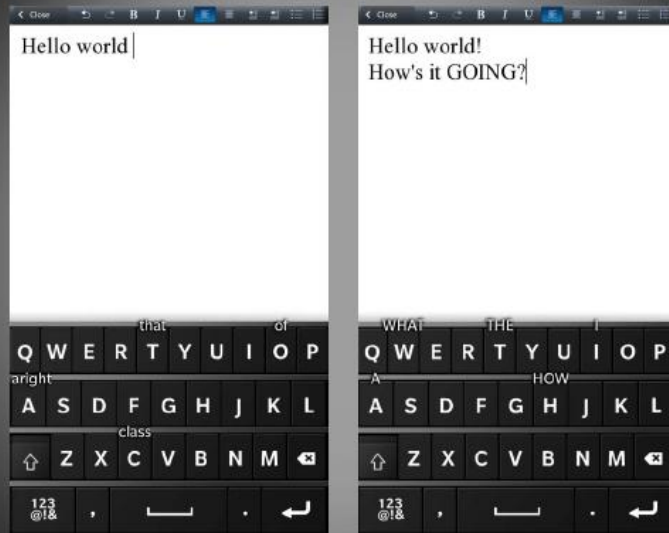
IT THINKS

An intelligent, predictive keyboard
that learns from and writes for you.

Lets you type fast with just one finger

Predicts the next letter, with the entire
word

Just swipe up on the letter to finish the
word



IT REMEMBERS

Time Warp photo lets you capture a moment even if you just missed it.

No more odd expressions or awkward retakes

No more eyes closed!



Roads to BlackBerry 10 Development



C++/Qt
Cascades



C/C++
Native SDK



HTML5 BlackBerry®
WebWorks™

Open standards

- Very easy to port C/C++
- Platform libraries built on open standards
- POSIX and STL friendly (*stdc++, socket, pthread, etc.*)



Open Standards (2)

- POSIX and STL
- C++, Sockets ([libstdc++](#), [libsockets](#))
- OpenGL ES 1.1 / 2.0 ([libEGL](#), [libGLESv1_CM](#), [libGLESv2](#))
- OpenAL 1.1 ([libOpenAL](#), [libalut](#))
- Imaging ([libpng](#), [libjpeg](#))
- Compression ([libz](#), [libbz2](#))
- Fonts ([libfreetype](#))
- Math ([libm](#))
- XML ([libxml2](#), [libxslt](#))
- Database ([libsqlite](#))

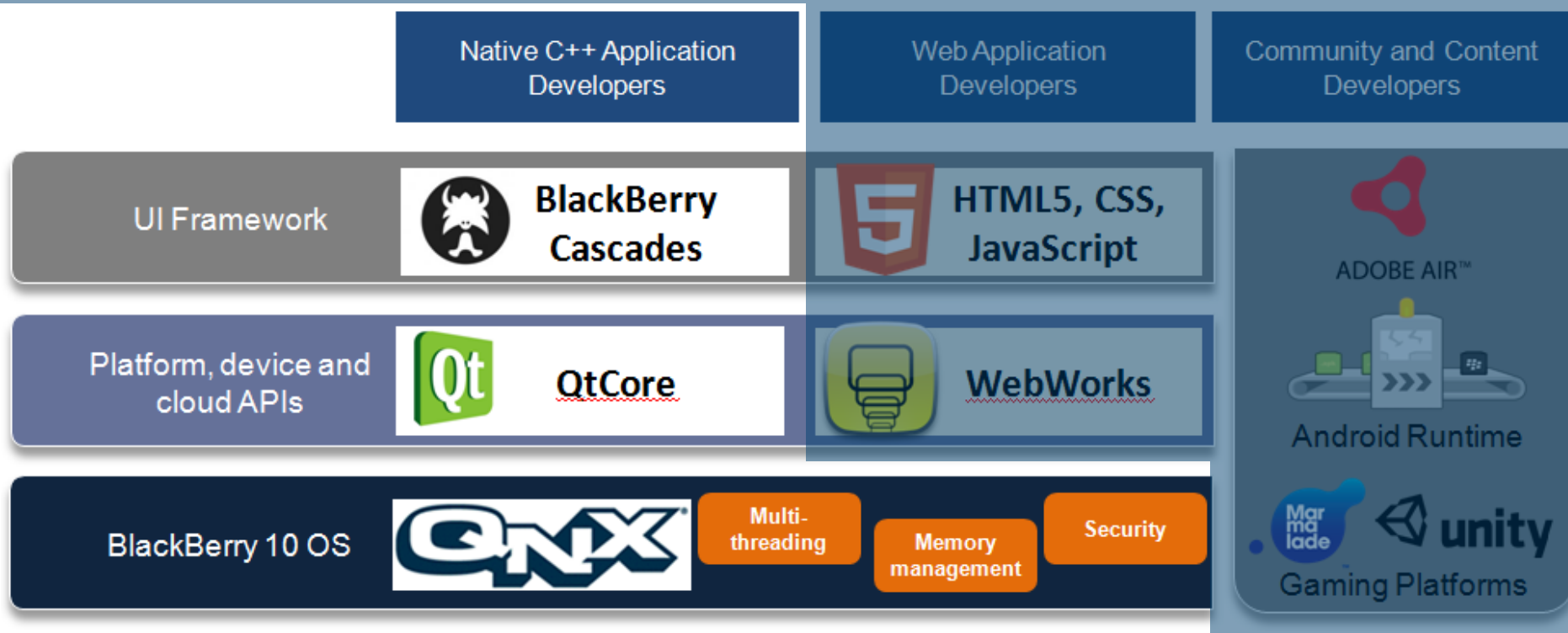


- Supports Windows, Mac OS X, Linux
- GCC 4.6.3 based compiler tool chain
- GDB 7.3 debugging
- Device Deployment Tools
- VMware Simulator Images
- Eclipse CDT 8 based IDE ([QNX Momentics](#))



BlackBerry 10 Overview

 **BlackBerry 10**



Zooming in on the NDK...

 **BlackBerry** 10

QNX

- Posix compatible
- C-APIs
- BPS event model
- Low Level Platform APIs
- Core open source libraries and standards

Open Source APIs



BlackBerry 10
Core APIs



Platform API (C) (libbps)

Zooming in on the NDK...

Open Source libraries

- Many already ported to QNX
- <http://blackberry.github.com/ndk>
- ...and more getting contributed

C++ platform, device
& cloud APIs

Platform API (Qt / C++) (libbbb)

QtCore, QtNetwork, QSql ...

Open Source APIs



Game Platforms



BlackBerry 10
Core APIs



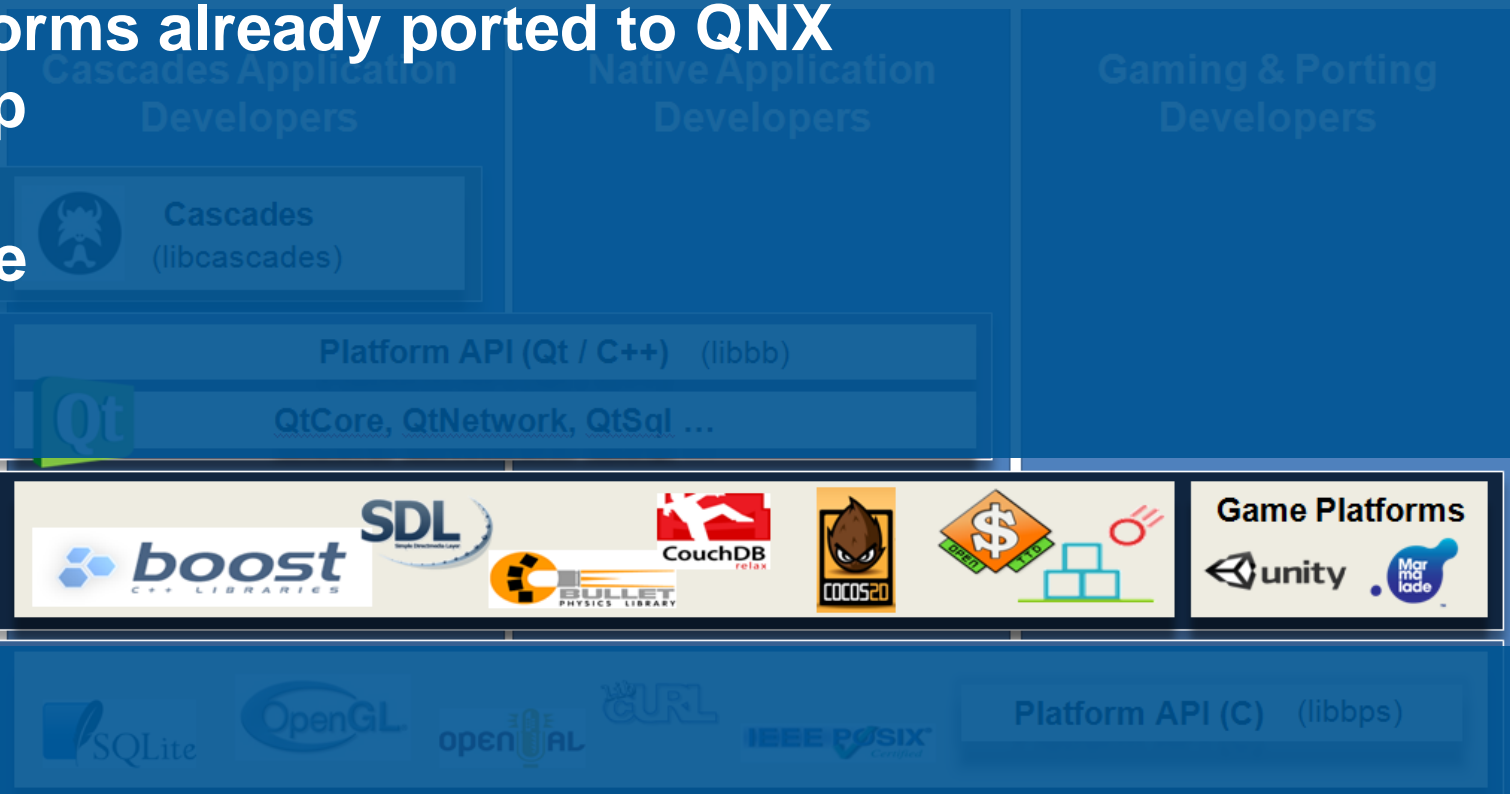
Platform API (C) (libbps)

Zooming in on the NDK...

 **BlackBerry 10**

Game platforms already ported to QNX

- ScoreLoop
- Unity
- Marmalade
- GameLoft



Zooming in on the NDK...

This part of the NDK is already available on PlayBook!

- <http://developer.blackberry.com/native>

C++ UI Framework



Cascades
(libcascades)

C++ platform, device
& cloud APIs



Platform API (Qt / C++) (libbbb)

QtCore, QtNetwork, QSql ...

Open Source APIs



Game Platforms



BlackBerry 10
Core APIs



Platform API (C) (libbps)

Native/Cascades Development



C++/Qt
Cascades



C/C++
Native SDK

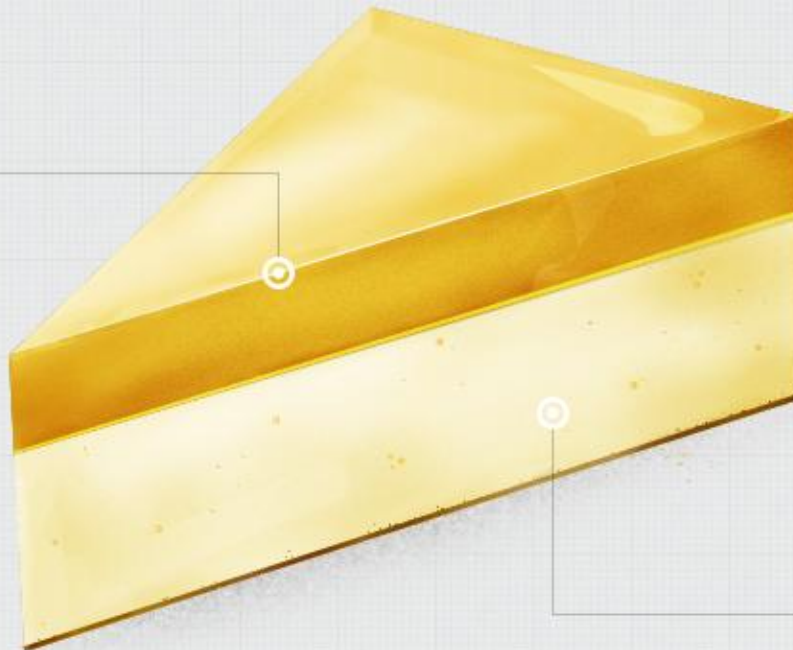
Cascades in the native SDK

BlackBerry 10

Figure 1: BlackBerry 10 Native SDK


Cascades *The Frosting* >

- Beautiful UI out of the box
- C++ App Framework
- Based on Qt and QML
- BlackBerry 10 UX built-in
- BlackBerry Integration APIs



Core Native > *The Sponge Cake*

- Porting heaven
- Game developer's delight
- POSIX compliant
- Raw OS access
- Open source friendly

 Core Native for PlayBook >

The NDK – Two layers

High Level – Cascades

- High level APIs / C++
- Qt, QML, JavaScript
- Built-in Elegance, beautiful UI
- Provides the BlackBerry 10 UX
- Visual tooling

Low Level – C API

- Posix/Low level C; great for porting
- Raw OS access, windowing, etc.
- OpenGL ES, OpenAL, ...Excellent for games
- Great for Open Source Integration



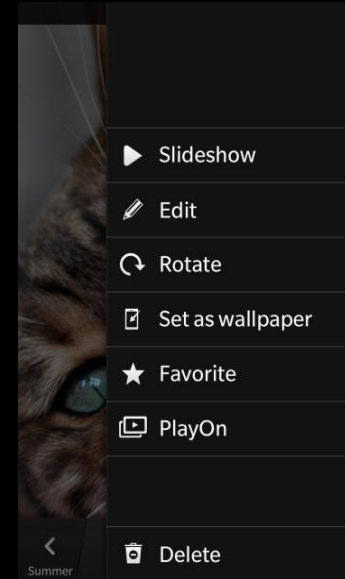
Why Use Cascades?

Elegant UI Framework

- Great looking core UI components
- Easy to build custom UI components
- Dedicated UI tooling including design preview (w/ Photoshop Plugin)

Increase Productivity

- Higher level APIs
- QT flavoured C++ and declarative UI approach



Cascades & Qt



- Mature C++ application framework
- Great APIs
- Signals and Slots
- Many helper classes
- QML

What's the deal?

- Cascades uses QT to provide plumbing and high level services
 - ▶ Object and event models
 - ▶ Markup parser (QtDeclarative)
 - ▶ Signals/Slots (i.e. callbacks)
 - ▶ Core services (e.g: XML-parsing, SQL libs.. Many more)
- Cascades does not use QtGui or QtQuick
 - ▶ BlackBerry 10 has it's own UI framework and roadmap
 - ▶ QtQuick QML != Cascades QML

Define the UI in QML

```
import bb.cascades 1.0
```

```
Page {  
    content:  
    Label {  
        text: "Hello World!"  
    }  
}
```

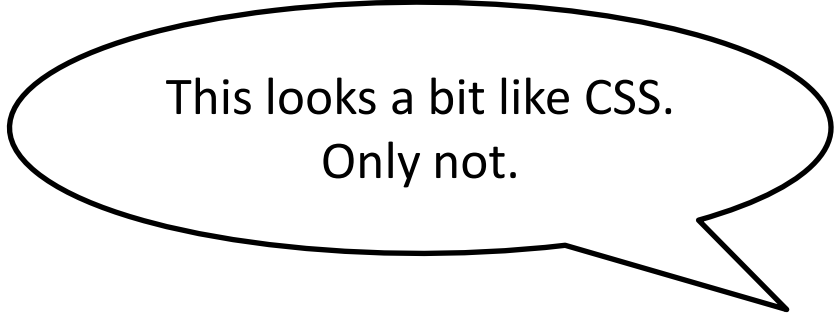


It's like HTML and JSON
had a baby.

Add some formatting

```
import bb.cascades 1.0
```

```
Page {  
    content:  
    Label {  
        text: "Hello World!"  
        horizontalAlignment: HorizontalAlignment.center  
    }  
}
```



This looks a bit like CSS.
Only not.

Add some JavaScript!

```
import bb.cascades 1.0
```

```
Page {  
    Container {  
        Label {  
            id: hello  
            text: "Hello World!"  
            horizontalAlignment: HorizontalAlignment.center  
        }  
        Button {  
            text: "German-ize"  
            onClicked: {  
                hello.text = "Hallo Welt!";  
            }  
        }  
    }  
}
```



Finally!

QML = Qt Modeling Language

QML can:

1. *Used by UI designers*
2. *Rapid prototype UI*
3. *Do white label/ branding/promotions of applications (with different QML files)*

```
import bb.cascades 1.0
```

```
Page {  
    content:  
        Label {  
            text: "Hello word!"  
        }  
}
```

(Simple QML designed to create a Hello World page)

Embeddable JavaScript!

- ▶ No need to reinvent the wheel
- ▶ Do more than just markup in QML
- ▶ Use separate JS files, create functions, handle signals

```
Button {  
    text: "Expand"  
    maxWidth: 200  
    onClicked: {  
        if (text == "Expand") {  
            text = "Contract"  
            maxWidth = 400  
        } else {  
            text = "Expand"  
            maxWidth = 200  
        } // else  
    }  
} // Button
```

Declarative QML (1)

```
import bb.cascades 1.0
```

```
TabbedPane { ← Objects
```

```
  showTabsOnActionBar: true ← Properties
```

```
  Tab {
```

```
    title: qsTr("Tab 1")
```

```
    Page {
```

```
      id: tab1
```

```
      actions: [ ← Arrays (also properties)
```

```
        // define the actions for first tab here
```

```
        ActionItem {
```

```
          title: qsTr("Rotate")
```

```
          onTriggered: { ← JavaScript functions (also properties)
```

```
            imgTab1.rotationZ = imgTab1.rotationZ + 90;
```

```
          }
```

```
        },
```

```
        ActionItem {
```

```
          title: qsTr("Break")
```

```
          onTriggered: {
```

```
            imgTab1.imageSource = "asset:///images/picture1br.png";
```

```
          }
```

QML Visual Tooling

BlackBerry 10

The screenshot displays the BlackBerry 10 QML Visual Tooling IDE. The main window is divided into several panes:

- QML editor with syntax highlighting/code completion:** The central pane shows QML code for a page with a dock layout. The code includes an import statement and a Page component with a DockLayout and a Container.
- QML design view:** The right pane shows a visual representation of the QML code, displaying a cityscape image with a lightning bolt and a slider control.
- Component library (Drag and drop to QML):** The bottom-left pane lists various QML components available for use, including ActivityIndicator, Button, CheckBox, Container, and DateTimePicker.
- QML tree view, QML properties view:** The right pane also shows a tree view of the QML structure and a properties view for the selected component.

```
import bb.cascades 1.0

Page {
    content: Container {
        layout: DockLayout {

            // Setting the background color to a color
            background: Color.create("#262626");

            // The content (images, slider ...) is
            Container {
                layout: StackLayout {

                    // The content should be centered
                    layoutProperties: DockLayoutProperties {
                        horizontalAlignment: HorizontalAlignment.Center;
                        verticalAlignment: VerticalAlignment.Center;
                    }

                    // The two images are put on top of each other
                    // a nice looking image frame is placed
                    Container {
```

C++ and QML – A two way street.

C++ code can load QML files and access QML objects.

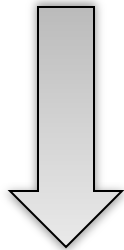
QML files can reference C++ values and objects

Everyone is happy



Invoking C++ from QML

QML



C++

```
// Background ImageView.  
ImageView {  
    imageSource: "asset:///images/backg  
  
    // If we touch the background we  
    onTouch: {  
        if (event.isDown ()) {  
            cowbellApp.playSound ("mc  
        }  
    }  
}
```

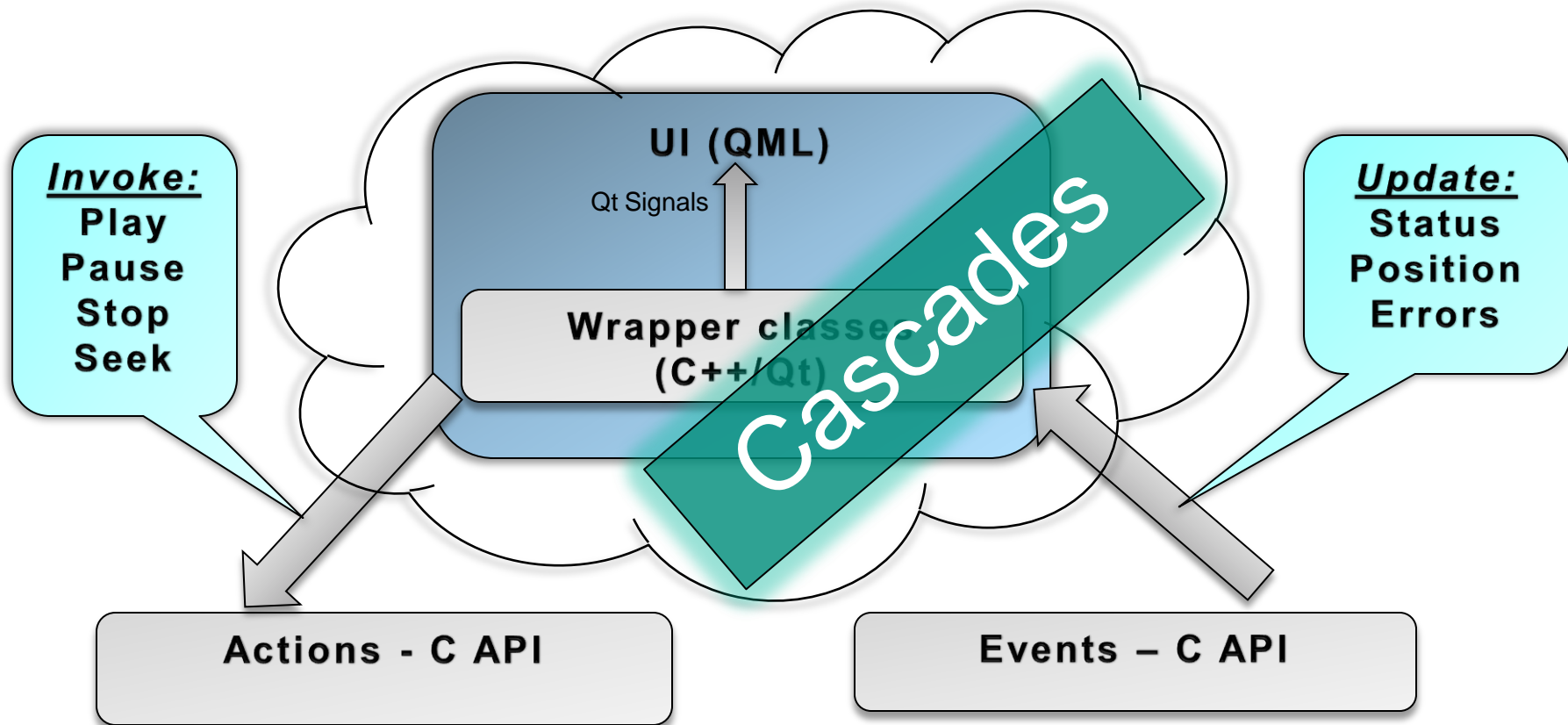
```
/**  
 * Invokable function used for triggering sounds from QML.  
 *  
 * @param msg a string describing which sound should be played.  
 */  
Q_INVOKABLE  
void playSound(const QString &msg);
```

Which layer for what?

- For UI – QML
- C++ for application logic (QtCore based)
- C and BPS to access system features
- Our github repo for popular frameworks and libs

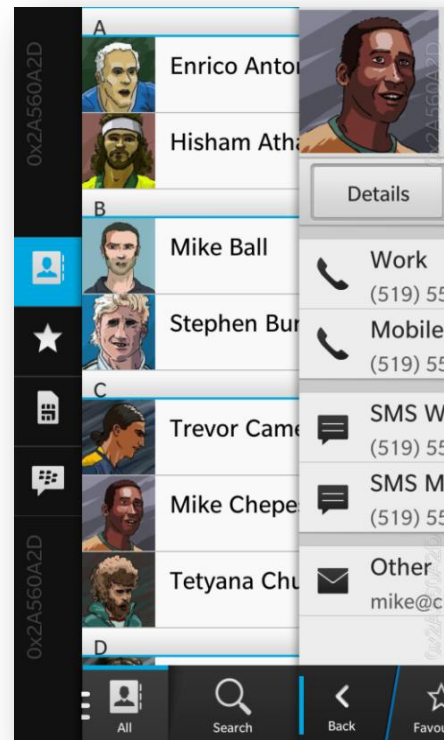
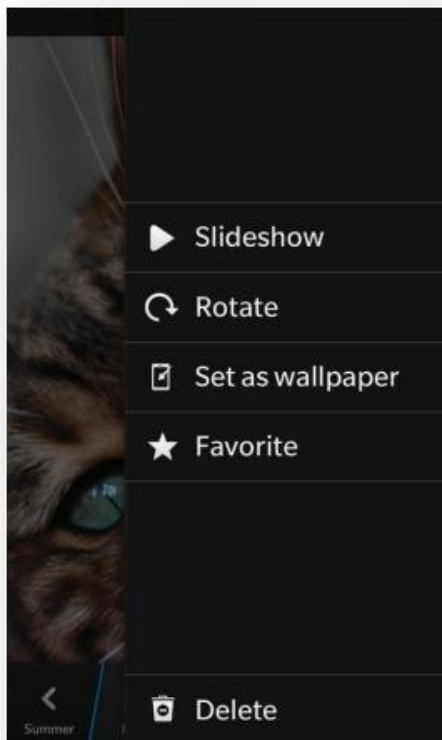
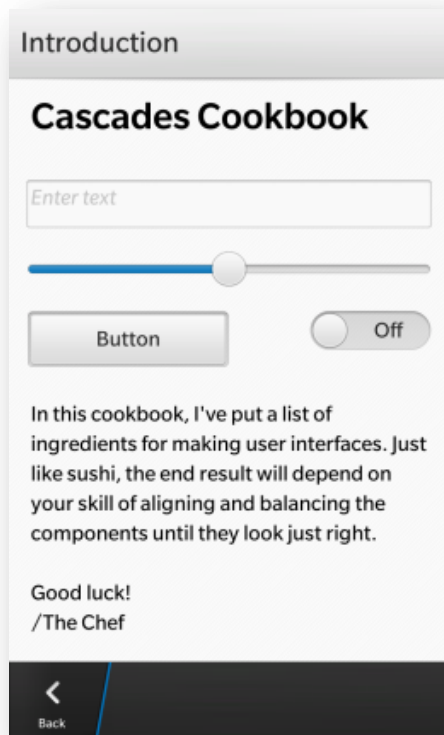
github.com/blackberry





Standard UI Components

BlackBerry 10





Label

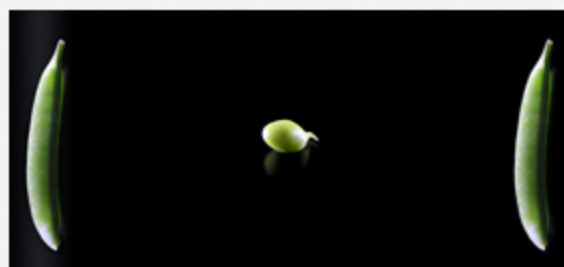
Custom QML components

Create your own custom QML components to supplement the core controls, and learn how to reuse your components.



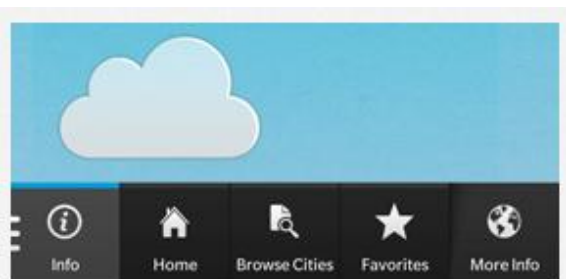
Images

Learn the strategies and best practices for creating and displaying images in your application.



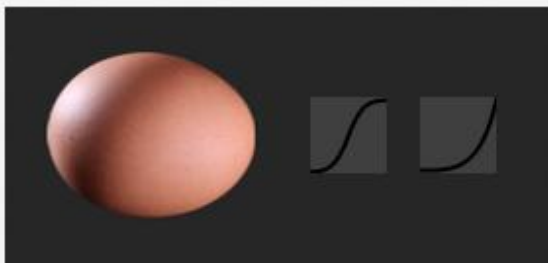
Layouts

Explore the different layout patterns that are available in Cascades and learn when to use them to arrange your UI controls.



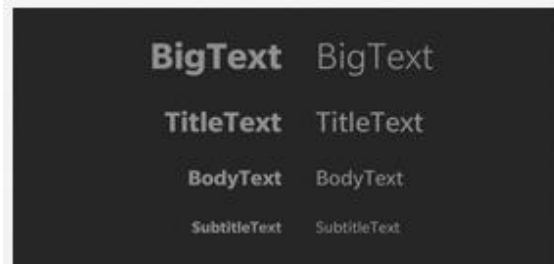
Updated: Navigation

Provide navigation in your apps by creating new screens, arranging screens in a stack, or using tabs to display your content.



Animations

Discover the powerful implicit and explicit animation system in Cascades, and learn how to precisely control your animations.



Updated: Text

Add some visual appeal to your text controls and learn how to display different versions of the virtual keyboard.

UI Framework (3)

 **BlackBerry 10**

Asia

Atlantis

Australia

Updated: Lists

Take advantage of the power and flexibility of lists, the basis of most mobile apps, and customize them to create the look you want.



Updated: Web content

Incorporate a WebView into your application, to browse webpages or use HTML inside your app.

[Learn about WebView](#)

Demo time:
Cascades Cookbook,
Cross fade, Poem
Maker



New: Dialogs, prompts, and toasts

Learn how to alert users of events that occur on the device, and provide other useful information in your apps.



App integration

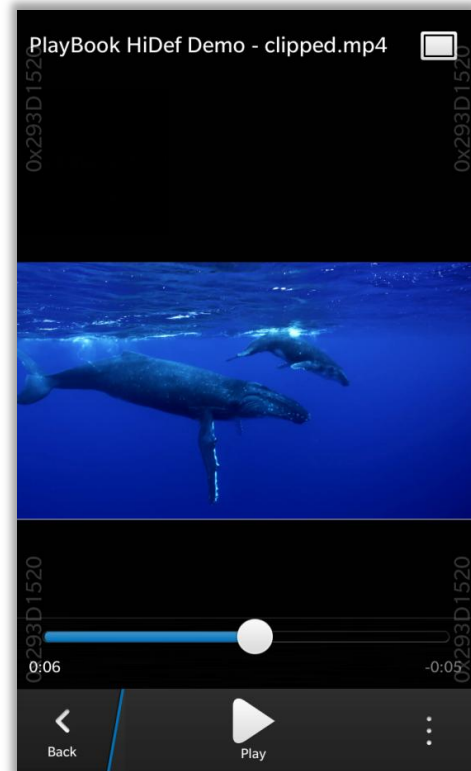
Launch another application or an external service from within your app.



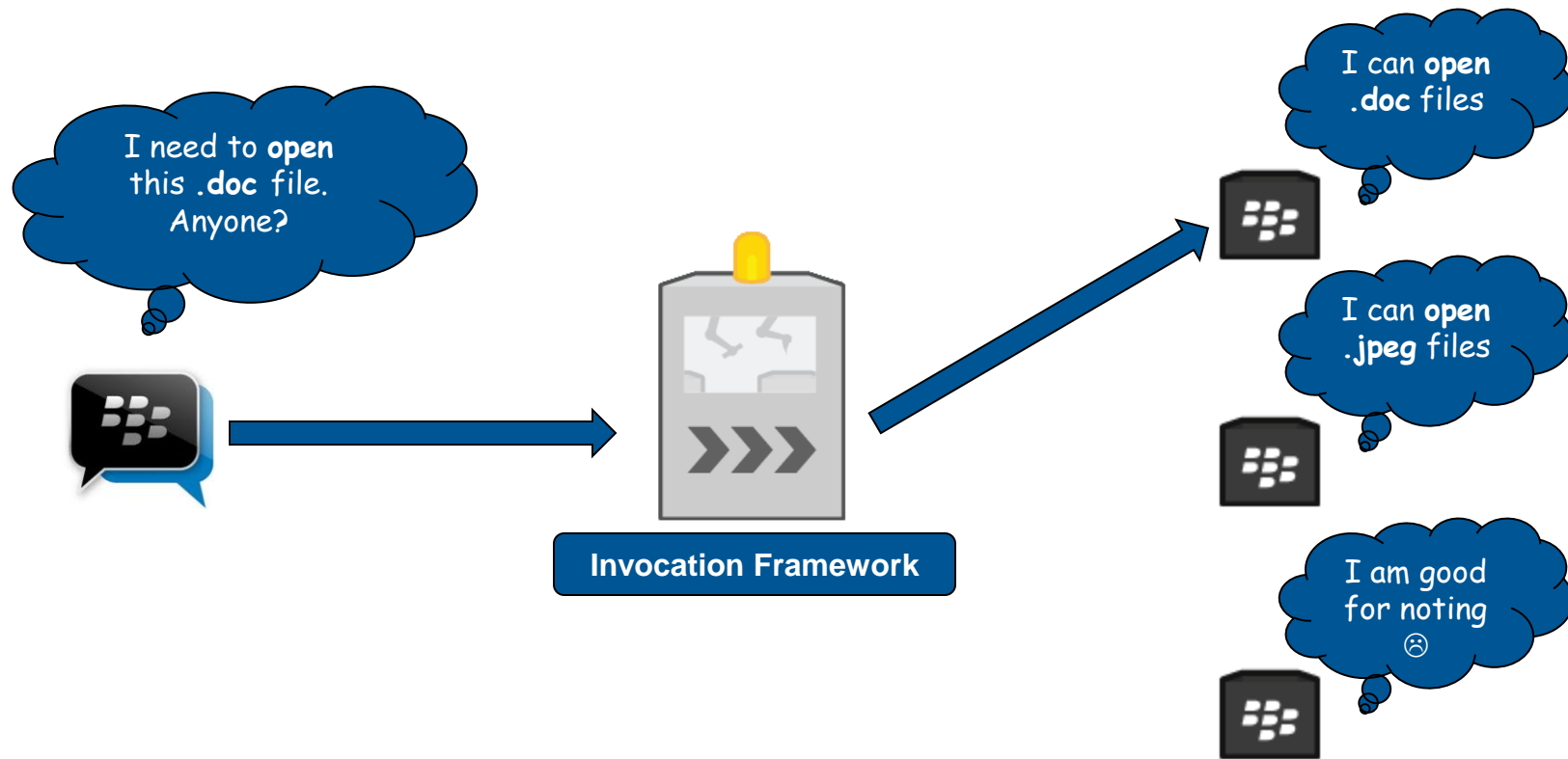
New: BBM Social Platform

Add social interaction and increase your app's popularity and discoverability by integrating with the BBM Social Platform.

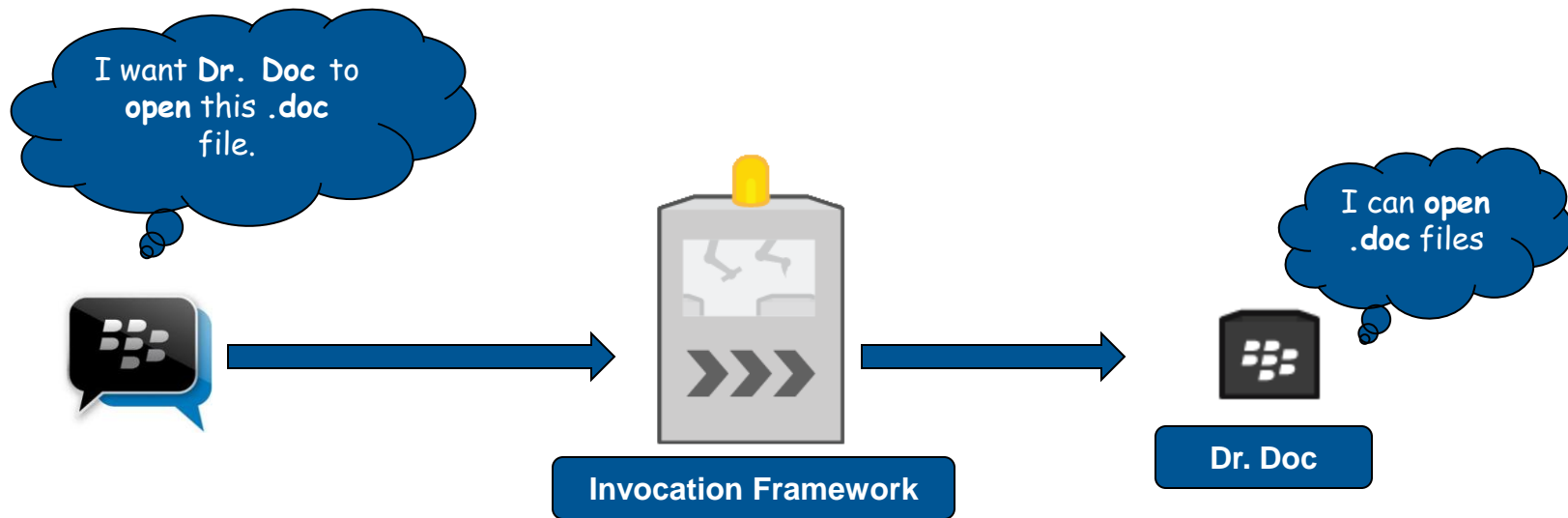
- Invoke other apps from your own!
- Flow seamlessly between applications
 - ▶ Provide that awesome experience
- Embed other apps (“viewers”) in your own!
 - ▶ Example: Just want to play a media file?
 - ▶ Just Invoke the media previewer!



Unbound Invocation

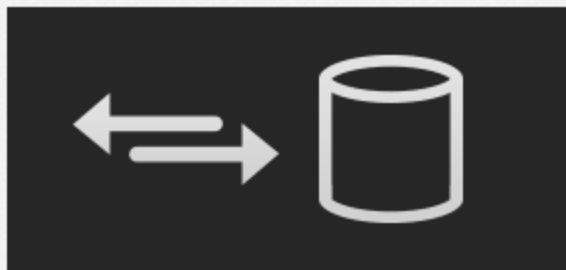


Bound Invocation



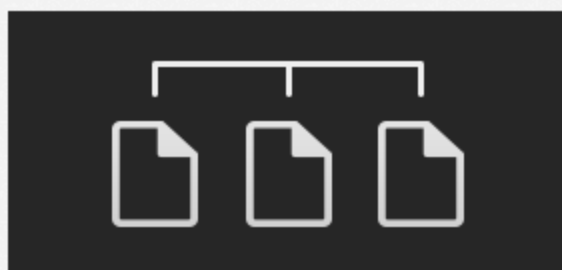
- **Increased discoverability:**
 - ▶ Reach over **45 million** users worldwide!
- **Increased engagement and app stickiness:**
 - ▶ Get the addicting social element!
 - ▶ Share / download between users, engage friends
- **Increased monetization:**
 - ▶ viral BBM discoverability + increased engagement = ***Richer developers*** 😊





Updated: Data storage

Learn how to access data from external sources, such as an SQL database or a JSON file, and display the data in your apps.



File system access

Learn about the application sandbox and how to access shared content on the file system of the device.



New: Internationalization

Prepare your application for markets around the world by translating your content and customizing it for a particular locale.

Cascades supports both:

- ▶ `QtSql`
- ▶ `libsql`

Easiest to use `QtSql` in a Cascades app, provided by `QtCore`



```
QString dbPath = "data/db.db";  
QSqlDatabase database  
QSqlDatabase::addDatabase("SQLITE");  
database.setDatabaseName(dbPath);  
database.open();  
  
QSqlQuery query(database);  
query.prepare("SELECT * FROM table");  
query.exec();
```



Screen and Windowing

The Screen and Windowing library provides a framework that makes it easier to create a user-interface. Learn how to use the API to create screens and windows so that you can display graphics, images and more.

*some
multimedia
samples!*



New: Audio / Video

Learn how to create visually astonishing UIs for your mobile apps with fully functioning multimedia support for both audio and video, as well as streams.

Image, Camera, Notifications

 **BlackBerry 10**



Image

Learn how to use the API to render images for your apps.



New: Camera

Find out how to use the camera to create apps that allow your users to take photos and record video.



New: Notifications

Create notifications that highlight events that occur in your app, and let users customize how they want to receive these notifications.



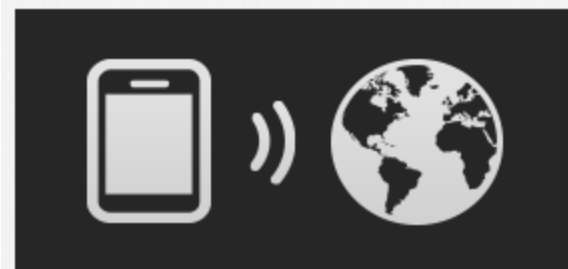
Location

Learn about how Cascades has reimplemented the Qt Mobility Location API to support positioning.



New: Sensors

Gather data from the various sensors on the device, including the accelerometer, magnetometer, and rotation sensor.



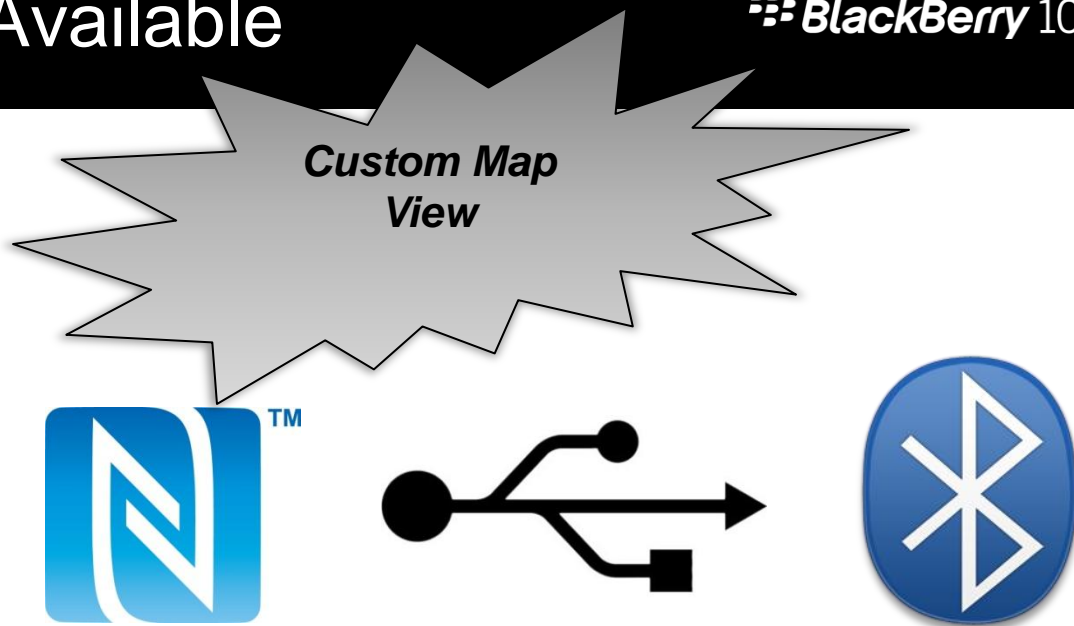
Networking

Learn about how Cascades uses the QtNetworking module and how to send and receive data using HTTP communication.

Sensor Subsystems Available

BlackBerry 10

- GPS
- Accelerometer
- Gyroscope
- Magnetometer
- NFC
- Bluetooth
- USB



Where do you Start?



<https://developer.blackberry.com/>

BlackBerry Developer

Design Develop Distribute Community App World

BlackBerry App World™ is **now open** for BlackBerry 10 Apps

Submit your App now to qualify for the \$10K developer commitment.

[Learn more about the \\$10k developer commitment](#)

[Submit](#)

Learn how to build **BlackBerry 10 Apps**

Easily port existing mobile Apps or create new ones. We make it easy. Download tools to develop your App. [Get started](#)

- C/C++ Native SDK
- HTML5 WebWorks
- Action Script Adobe AIR
- Java Android Runtime
- Java BlackBerry Java
- Themes Theme Studio

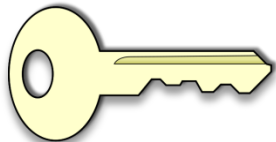
Getting Started

4 Easy Steps!



Download the Native SDK

developer.blackberry.com/native



Register for Signing Keys



Run the getting started wizard

- ▶ Window -> Preferences -> BlackBerry
Sets up your environment, keys, debug token

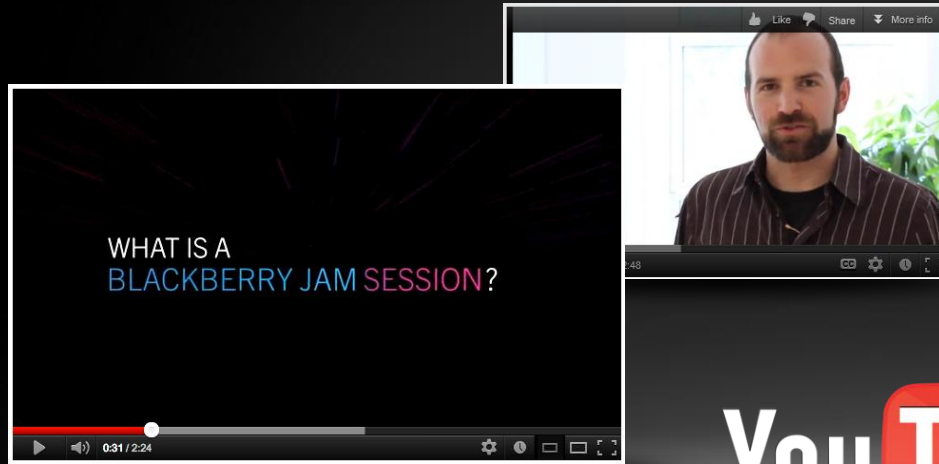


Create a new Hello World app and
deploy it to your device

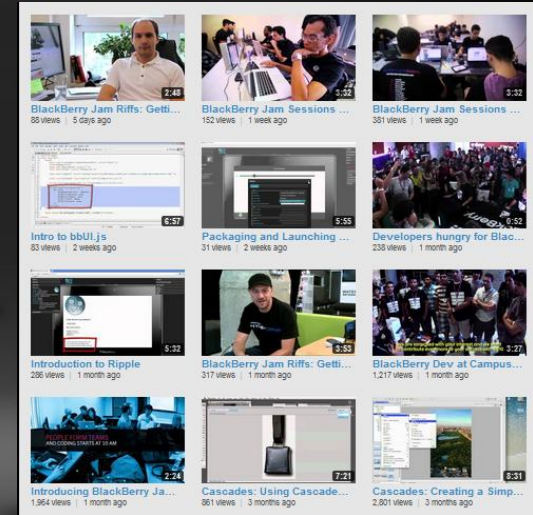
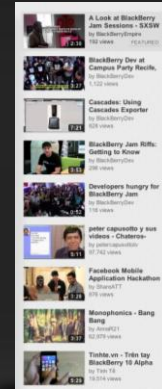
Getting Started

Resources

- BlackBerry Native Development
 - <http://developer.blackberry.com/native>
- BlackBerry Developer Blog
 - <http://devblog.blackberry.com>
- BlackBerry Jam Sessions (LOTS of slides & videos)
 - <http://www.blackberryjamconference.com/americas/content/sessions>
- Forums:
 - <http://supportforums.blackberry.com/t5/Developer-Support-Forums/ct-p/blackberrydev>
- Twitter
 - **@BlackBerryDev**



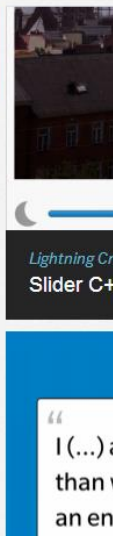
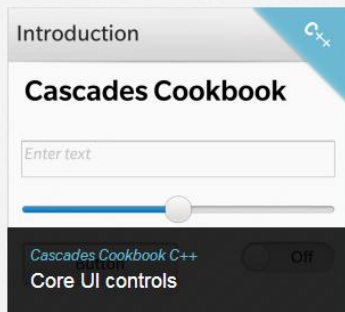
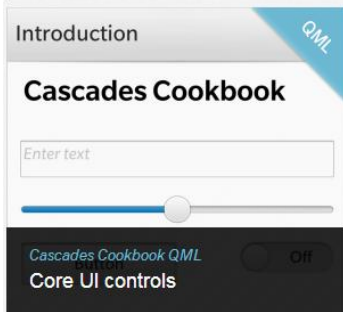
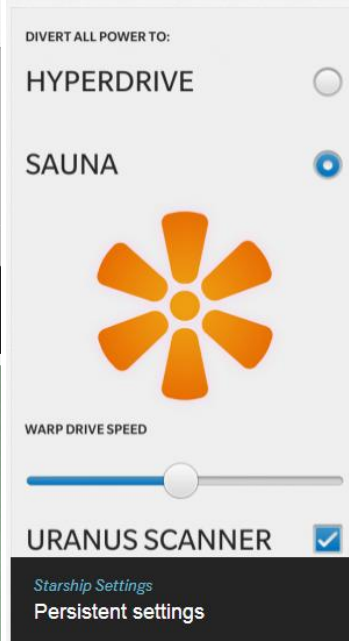
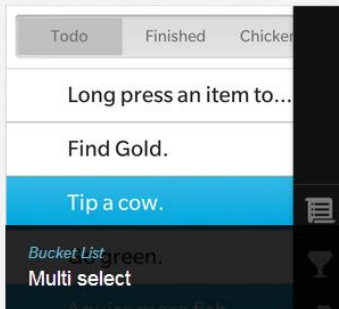
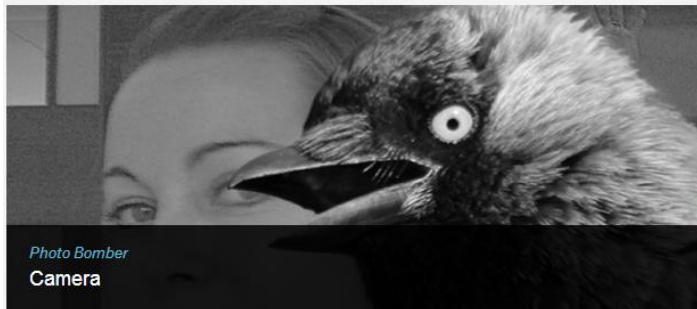
youtube.com/blackberrydev



Lots of sample apps!

 **BlackBerry 10**

Sample Apps

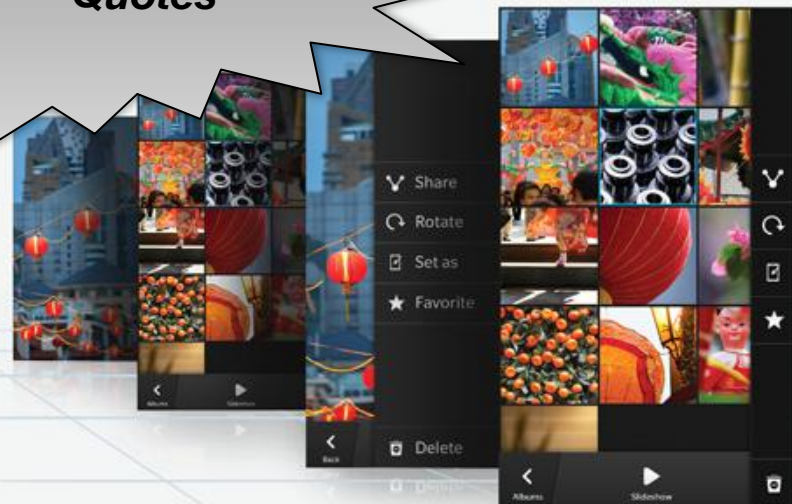


UX Trumps all!

 **BlackBerry 10**

- UX Guidelines For BlackBerry 10
- Key Principles
 - ▶ A Cinematic Experience
 - ▶ Multitasking as 2nd nature
 - ▶ Content is king
 - ▶ Fluid Workflow
 - ▶ Moments of Charm

*One last app:
Quotes*



Thanks

Shadab Rashid

Application Development Consultant
Developer Relations

@surashid

shrashid@rim.com