



# RAD Studio XE5 in Action

## *LIVE!*

Paweł Głowacki

Bogdan Polak



## Welcome and Introduction

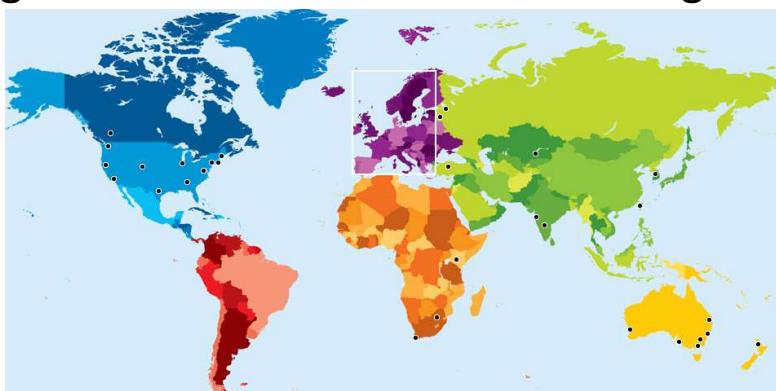
## Agenda

|               |   |
|---------------|---|
| 09:20 - 10:00 | Rejestracja uczestników, kawa powitalna   |
| 10:00 - 10:10 | Otwarcie konferencji i wprowadzenie   |
| 10:10 - 10:30 | Świat "multi-device" - analiza bieżącej sytuacji rynkowej   |
| 10:30 - 11:00 | Zatrzymałeś się na aplikacjach typu desktop?  |
| 11:00 - 11:45 | 5 głównych błędów przy tworzeniu aplikacji mobilnych oraz sposoby na ich uniknięcie                 |
| 11:45 - 12:15 | Przerwa kawowa  |
| 12:15 - 13:45 | Poznajmy prawdziwie natywne programowanie - jedna baza kodu, wiele urządzeń i systemów operacyjnych |
| 13:45 - 14:00 | Podsumowanie i zakończenie konferencji  |



## RAD Studio XE5 Tech Preview World Tour

- More than 50 stops just in August and September
  - <http://www.embarcadero.com/world-tour>
- Hundreds of stops to come in October to December
- Existing and New Customer events throughout



EMBARCADERO TECHNOLOGIES

# Embarcadero Technologies

Founded 1993  
3.2 Million Customers  
500+ Employees in 29 Countries  
5 R&D Centers of Excellence  
World Wide Sales & Support

**embarcadero**

8

EMBARCADERO TECHNOLOGIES

## Embarcadero Products

**Application Development**

- RAD Studio
- C++Builder
- Delphi
- HTML5 Builder

**Data Architecture and Modeling**

- ER/Studio Data Architect
- ER/Studio Portal
- ER/Studio Business Architect
- ER/Studio Software Architect

**Database Development, Administration and Performance Optimization**

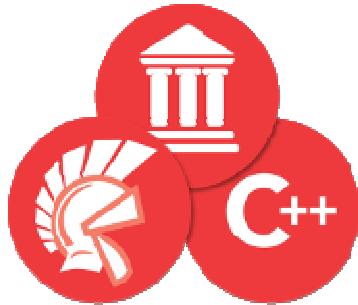
- DB Power Studio
- DBArtisan
- Rapid SQL
- DB Optimizer
- DB Change Manager

**Embedded and Workgroup Databases**

- InterBase

**embarcadero**

## 3 Million Delphi/C++ Developers Coding ...



- 9.7 Billion lines of code per year
- 100,000 Windows Apps
- 80% less code required – effective \$1.60 per line of code
- \$62 Billion in annual developer savings

**Embarcadero**

**embarcadero**

**The multi-device world we  
live in...**

a situational analysis

# 2013: The Client Revolution

1 Billion



Windows

65 Million



Mac

1 Billion+



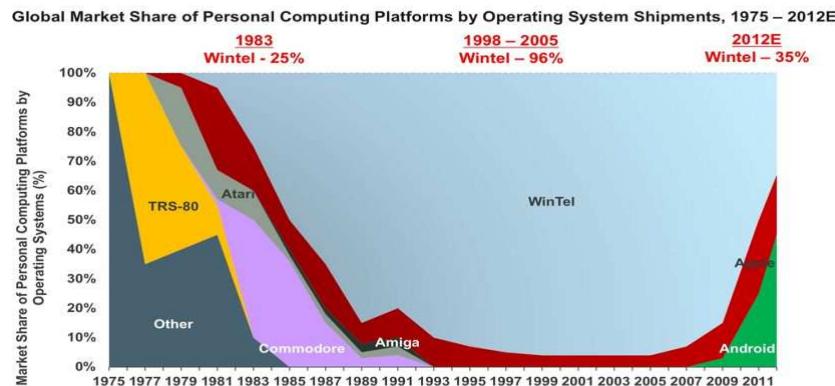
Mobile

Today's Unprecedented Multi-Device Landscape

**Embarcadero**

## The Client Revolution

Re-Imagination of Computing Operating Systems -  
iOS + Android = 45% Share vs. 35% for Windows



KPCB

Source: Asymco.com (as of 2011), Public Filings, Morgan Stanley Research, Gartner for 2012E data. 2012E data as of Q3:12.

24

An Unprecedented Multi-Device Landscape

**Embarcadero**

EMBARCADERO TECHNOLOGIES

# 2013+



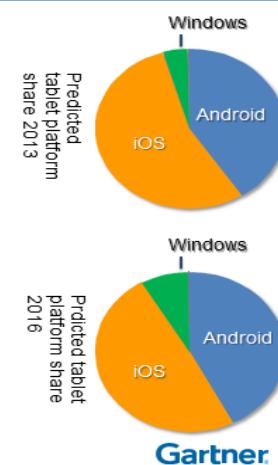
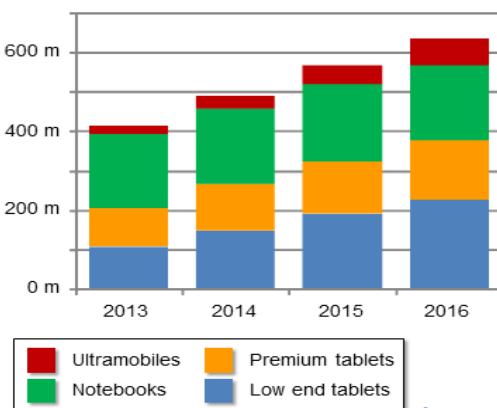
Client Device Diversity Will Continue to Expand

EMBARCADERO TECHNOLOGIES

## Global mobile and PC tablet shipments

### Mobile PC and tablet shipments

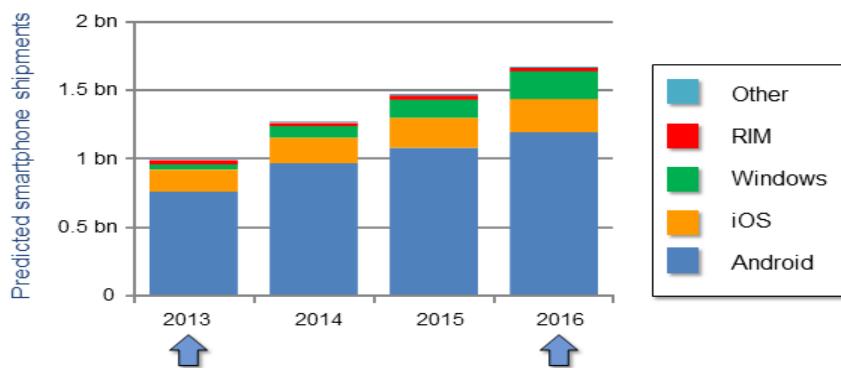
Predicted mobile PC and tablet shipments 2013 to 2016  
Gartner predictions published Q4 2012.



EMBARCADERO TECHNOLOGIES

## Global smartphone shipments

### Smartphones Will Dominate Handsets



The rise of smartphones

Smartphones will be 52% total global handset shipments

Smartphones will be 78% total global handset shipments

Gartner

Embarcadero

EMBARCADERO TECHNOLOGIES

## Tablet OS, shipments and market share Q2 2013

**Top Tablet Operating Systems, Shipments, and Market Share, Second Quarter 2013  
(Shipments in Millions)**

| Vendor           | 2Q13 Unit Shipments | 2Q13 Market Share | 2Q12 Unit Shipments | 2Q12 Market Share | Year-over-Year Growth |
|------------------|---------------------|-------------------|---------------------|-------------------|-----------------------|
| 1. Android       | 28.2                | 62.6%             | 10.7                | 38.0%             | 162.9%                |
| 2. iOS           | 14.6                | 32.5%             | 17.0                | 60.3%             | -14.1%                |
| 3. Windows       | 1.8                 | 4.0%              | 0.3                 | 1.0%              | 527.0%                |
| 4. Windows RT    | 0.2                 | 0.5%              | N/A                 | N/A               | N/A                   |
| 5. BlackBerry OS | 0.1                 | 0.3%              | 0.2                 | 0.7%              | -32.8%                |
| Others           | 0.1                 | 0.2%              | N/A                 | N/A               | N/A                   |
| <b>Total</b>     | <b>45.1</b>         | <b>100.0%</b>     | <b>28.3</b>         | <b>100.0%</b>     | <b>59.6%</b>          |

Source: IDC Worldwide Tablet Tracker, August 5, 2013

Embarcadero

EMBARCADERO TECHNOLOGIES

# Change.. It's constantly all over the media



Acer to downplay Windows in favor of Android, Chrome OS

**Preparing for 'the day after tomorrow'**

By Neil McAllister, 8th August 2013 [Follow](#) 299 followers

HOME PAGE TODAY'S PAPER VIDEO MOST POPULAR U.S. Edition ▾

The New York Times

Business Day  
Technology

WORLD U.S. N.Y. / REGION BUSINESS TECHNOLOGY SCIENCE HEALTH SPORTS

Dell's Profit Declines 72% on Sluggish Sales of PCs

VB

what's hot? CLOUDBEAT 2013 ▾ APPLE ▾ GOOGLE ▾ FACE

/BUSINESS HP posts revenue decline as PC sales weaken further



Android rockets and iOS gains, while Windows dips

**Summary:** Android device shipments leap, but there's yet more bad news for PC makers as the market continues to slide, despite their experiments with new formfactors.

BBC Sign in

NEWS BUSINESS

Facebook shares soar 18% on strong mobile ad earnings



Embarcadero

EMBARCADERO TECHNOLOGIES

# DEMO

Embarcadero



**Stranded on the desktop?!**

## **What does all this CHANGE mean to YOU?**

- You
- Your team
- Your business

## These changes and... You

- Your career choices either...
  - Expand hugely
  - Continually get smaller, so cling to the job you have
- Your project participation
  - Drive the best new projects
  - Have the opportunity to be the developer “hero” to the business
  - Innovate in ways you had not imagined
- OR
  - Work more and more on legacy only projects



## These changes and... Your Team

- All of the same criteria as “You”
- Be split in as many ways as there are platforms
  - Currently that would be three to four groups (Win, Android, iOS, OS X)
  - How would you manage that without
    - 3x/4x budget and 3x/4x developers
  - Demotivated team members would leave for better projects and prospects

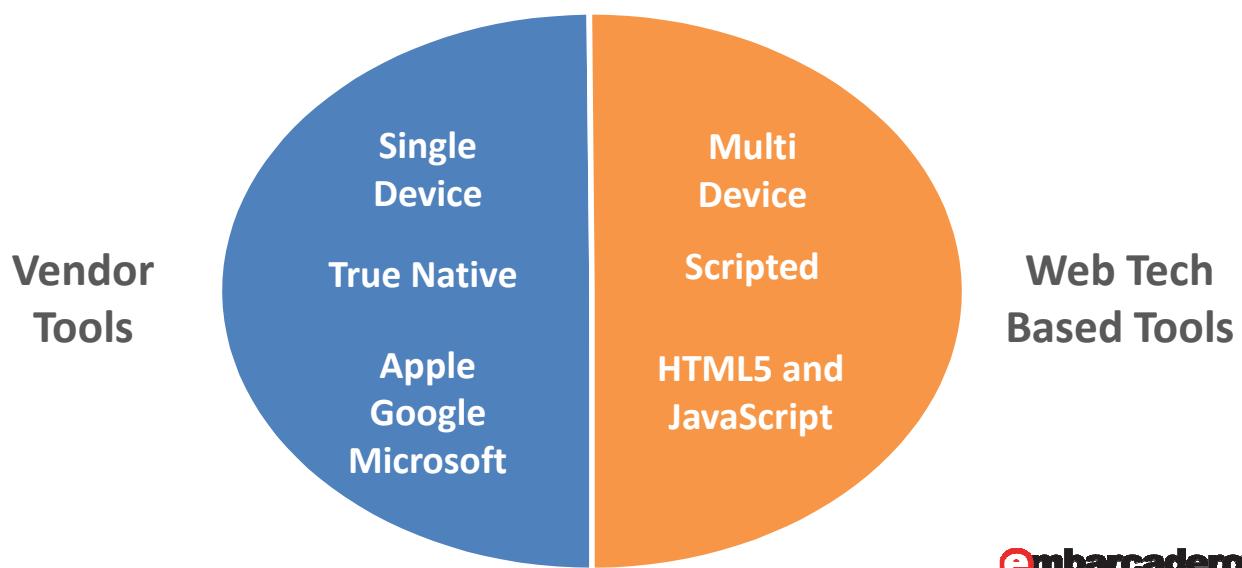


## These changes and...Your Business

- Customers that expect you to always be there
  - 24/7, in-their-hand interaction to your business is now demanded of businesses of all sizes
  - Those that are WIN, those that aren't LOSE
- Costing...
  - Transactional cost and impulse buy
  - Customer retention and loyalty
  - Complete loss of opportunity within market time windows
  - Be totally excluded from large customer demographics



## Current Tools Choices



## Pros & Cons for Multi-Device – Vendor Tools vs Web Tech Tools

### Pros

Native UX  
Native performance  
Secure

**Single Device**  
**True Native**  
Apple  
Google  
Microsoft

**Multi Device**  
**Scripted**  
HTML5 and  
JavaScript

### Cons

Multiple code bases  
Multiple teams  
Higher dev cost



## Vendor Tool Approach for Targeting Multiple Devices

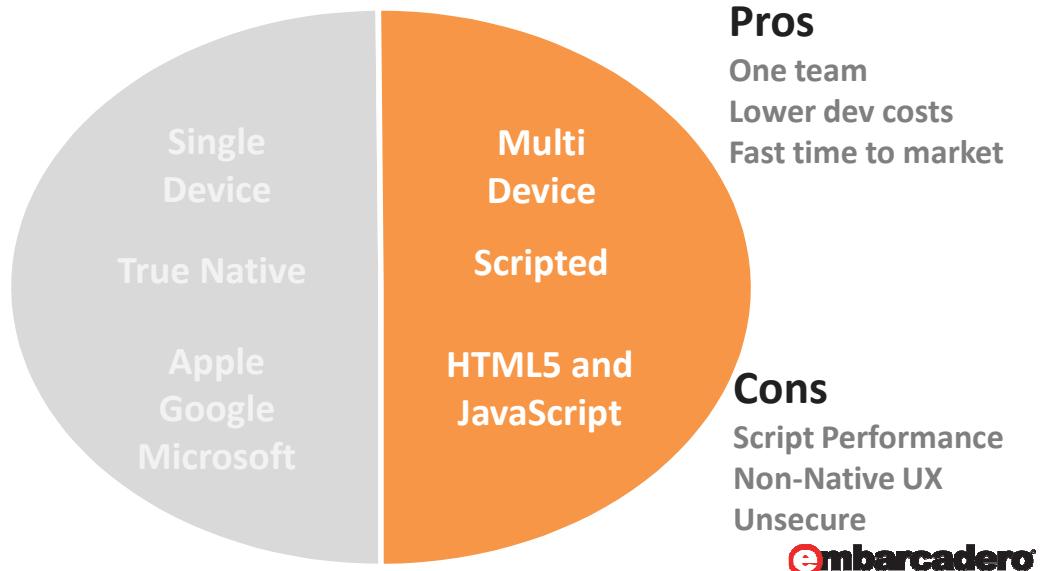


**multiple languages, multiple codebases**



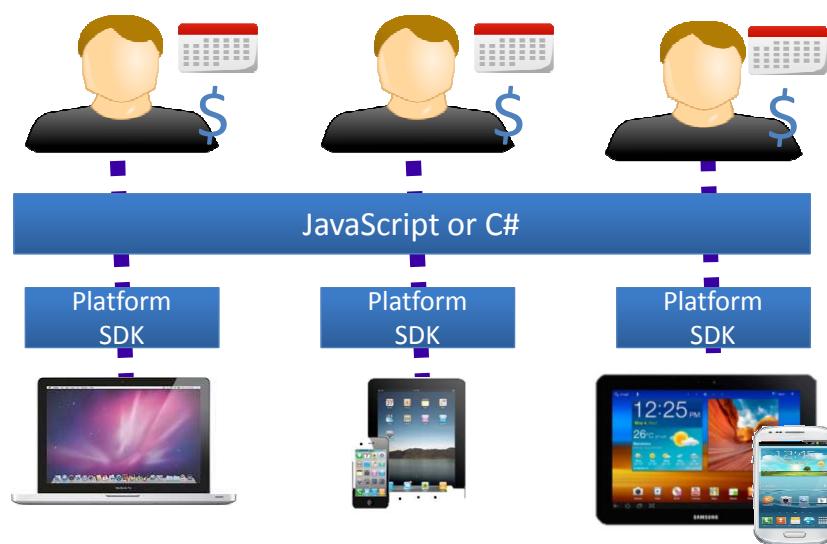
EMBARCADERO TECHNOLOGIES

## Pros & Cons for Multi-Device – Web Tech Based Tools



EMBARCADERO TECHNOLOGIES

## Virtual Code Mobile Solutions

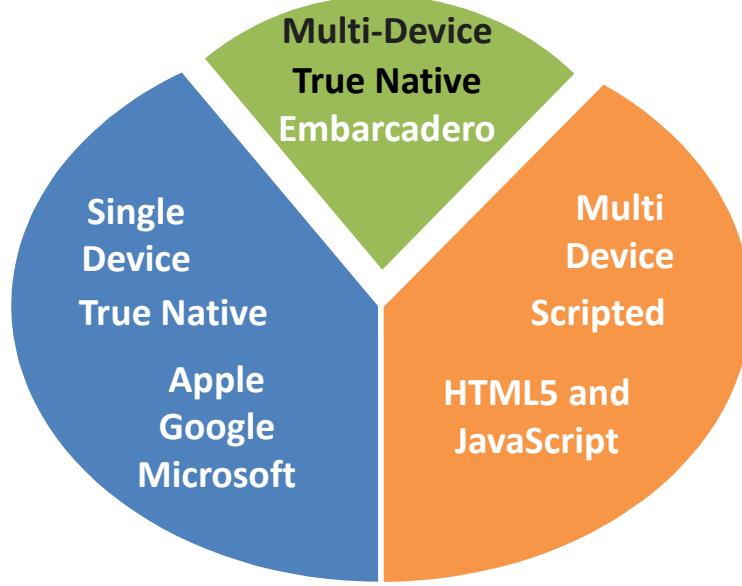


one language, multiple codebases

**Embarcadero** 22

EMBARCADERO TECHNOLOGIES

## Multi-Device True Native

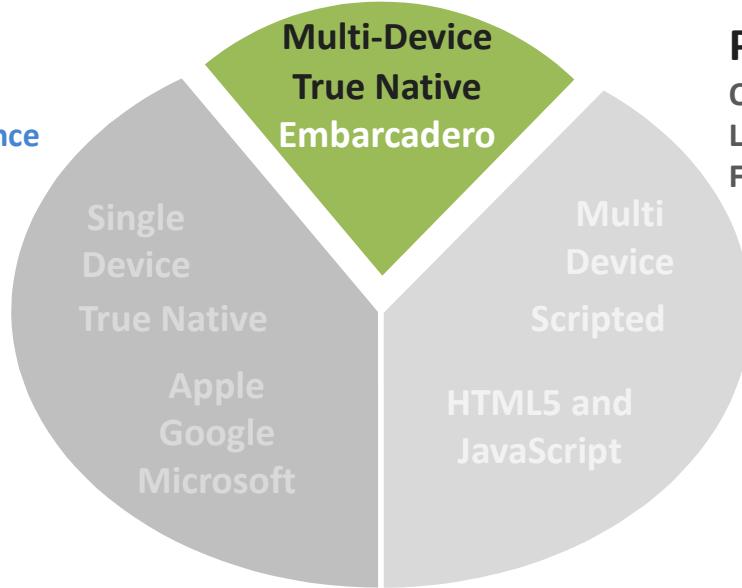


EMBARCADERO TECHNOLOGIES

## Multi-Device True Native

### Pros

- Native UX
- Native performance
- Secure



### Pros

- One team
- Lower dev costs
- Fast time to market

# DEMO

 **Embarcadero**

 **Embarcadero**

**The 5 mistakes  
developers make  
when moving to mobile...**

## Mistake #1

### Trying to fit a desktop experience onto a mobile device



Mobile devices lack the facilities of a PC including

- large display for easy viewing
- a robust in memory cache for fast data process
- external keyboard for easy typing

Developers try to build overly complex capabilities into mobile devices:

- cluttering the screen
- draining device resources
- impacting the end user experience

### How to avoid it

- Identify the high value actions within the app that are most likely to be used
  - design only for these requirements
  - ensure users can complete them with minimum taps
  - set a maximum tolerance for the no. of steps a user has to take to complete an action
- Learn the formula for the most common app types and stick to those, until you are really expert



## Mistake #1: How to avoid it with RAD Studio

- App templates to get you started
  - Common layouts for mobile devices (phone and tablets)
  - Master Detail templates
- Easy to use components, for fast, consistent development
- Designer support for different device types, form factors, resolutions, and orientations



## Mistake #2

### Not making the mobile user experience your top priority



- with hundreds of thousands of apps your users have lots of choices
- if your app is not easy to use people will avoid it
- users don't come back after a poor initial user experience
- Remember - not all devices are the same!

### How to avoid it

- focus on a good user experience design
- show key users prototypes of the app on actual mobile devices for regular feedback
- Be aware of touch zones
- Understand how the keyboard affects your design

**Embarcadero**

## Mistake #2: How to avoid it with RAD Studio

- Rapid prototyping so that you (and your customer) can check on the device, every step of the way
- Use the behavior and sensor service to dynamically discover what is available on a device at runtime

**Embarcadero**

## Mistake # 3

### Letting too much get between the app, the OS and the Hardware



- You must shave every possible millisecond off response time and utilize all relevant capabilities offered by the device
- A mobile app development platform that abstracts away device details delivers only the common denominator of functionality across devices

### How to avoid it

- Build a true “Native App” meaning your app is not only built for a particular operating system
- A native app is optimised for the particular hardware
- Skip wrappers like JVMs that abstract away control of fine grained capabilities and code directly to the device whenever possible



## Mistake #3: How to avoid it with RAD Studio

- Build True Native applications
- Performance tips and tricks
- ... paging?
- App behaviour design mistakes?



## Mistake #4

### Building separate apps for different platforms



Building different apps with separate codebases for different platforms can lead to multiple issues

- many of your end users own multiple devices
- your app may perform differently on each device
- with separate apps features get released and bugs get fixed at different times
- results in out of sync scenario – confusing to users
- Managing multiple codebases results in extra development work and higher overhead

### How to avoid it

Leverage a single codebase that is compiled and optimised for different platforms and device form factors

- you will deliver a more consistent user experience across all devices
- realise significant savings with fewer resources required for development, QA and bug fixes using a single codebase



## Mistake #4: How to avoid it with RAD Studio

- One Language
- One Codebase
- One Application Platform



## Mistake # 5

### Not doubling down on security



Relying on device or network security measures to protect your app data can be hazardous

- the app must take active measures to protect data that is resident to the device
- the app must take active measures to protect data passed in comms. and service calls that happen within the app
- Java and JavaScript are notorious hacker targets

### How to avoid it

- for key interactions code directly to the device
- include your own security precautions to reduce the risk of third party attacks
- encrypt sensitive data stored on the device



## Mistake #5: How to avoid it with RAD Studio

- Show CPU debug views to prove real native apps
- End/end encryption events with d/snap mobile clients?

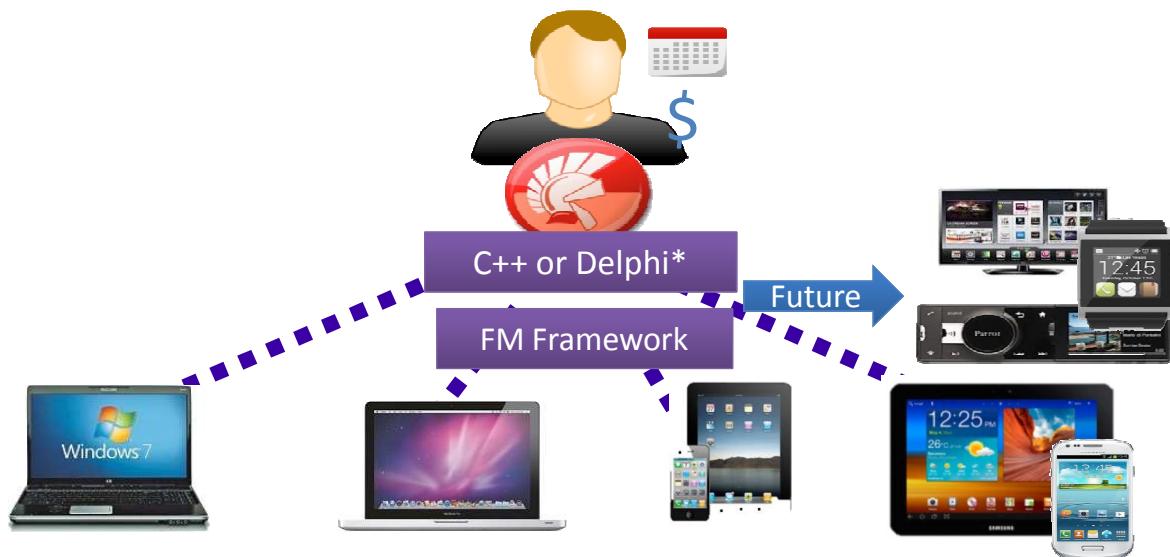




EMBARCADERO TECHNOLOGIES

## Getting to grips with multi-device, true native single codebase development

### RAD Studio XE5



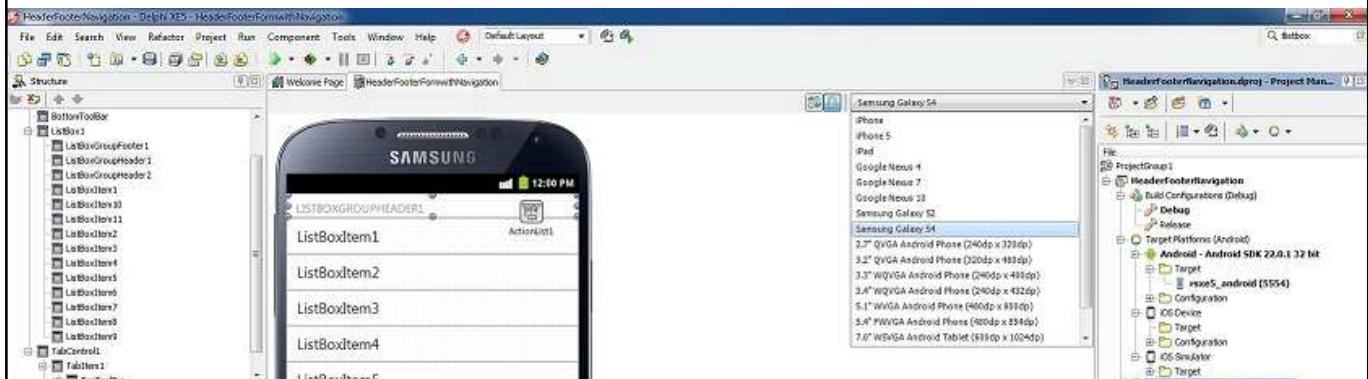
One team, One codebase

Embarcadero  
59

EMBARCADERO TECHNOLOGIES

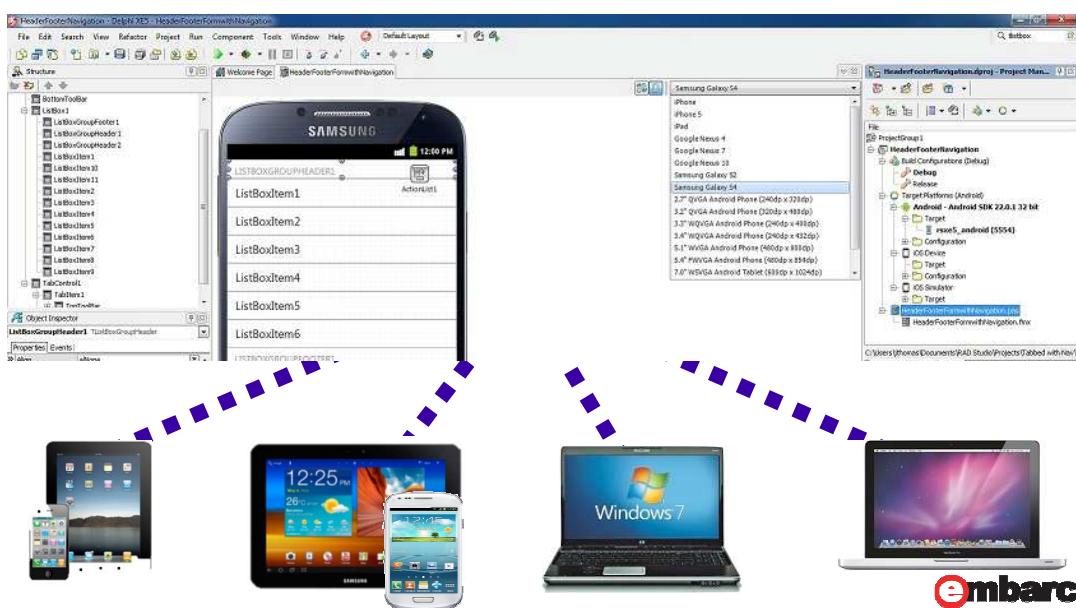
## Delphi FireMonkey on Android and iOS

- “Native” and Custom Styles
- True Native Apps
- Delphi components and development model



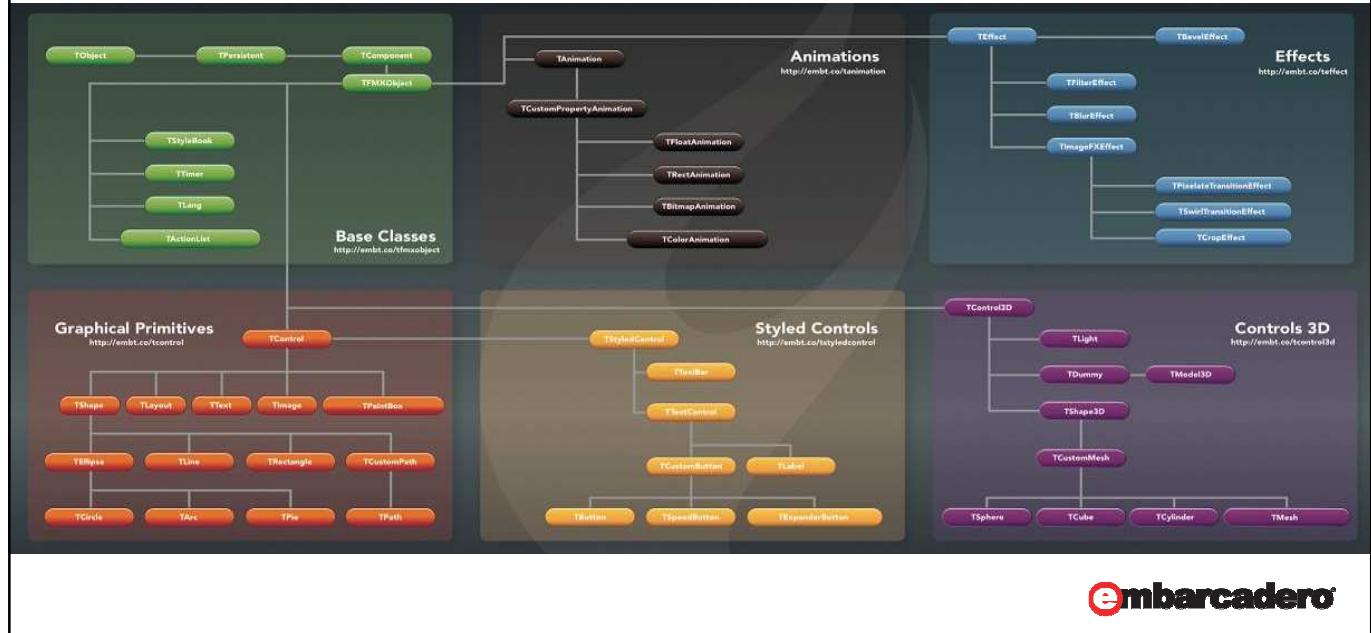
EMBARCADERO TECHNOLOGIES

## Visual Development

**embarcadero**

EMBARCADERO TECHNOLOGIES

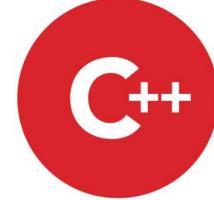
# Component-Based Framework

**Embarcadero®**

EMBARCADERO TECHNOLOGIES

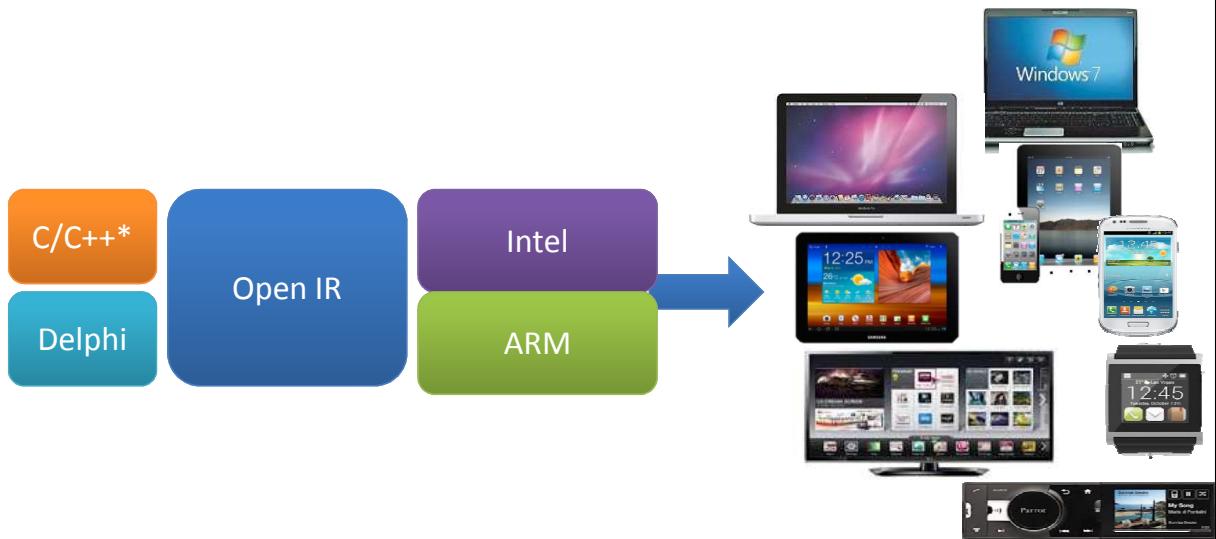
# Modern Language Features

- Property-Method-Event
- Automatic Reference Counting
- Interfaces
- Attributes
- Generics/Collections
- Anonymous Methods (Lambda functions/closures)
- Rich RTTI (introspection/reflection)

**Embarcadero®**

EMBARCADERO TECHNOLOGIES

# Common Compiler Architecture



64

\*) C++ support for ARM scheduled for later 2013

**Embarcadero**

EMBARCADERO TECHNOLOGIES

# FM Component Framework Architecture

|           |  |   |   |
|-----------|--|---|---|
| Language  |   |   |   |
| Framework |    |   |   |
| 3D API    | Microsoft® DirectX®  |  |            |
| Platform  | <br>Desktop   |  | <br>Mobile |

**Embarcadero**

## Cross compilation and Packaging



## Built-in Mobile Application Wizard

- Start with a blank HD or 3D FireMonkey application
- Choose from Tabbed Application, Header/Footer and Master/Detail Templates



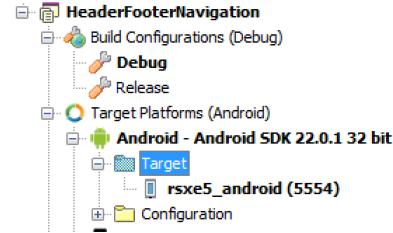
## IDE deployment options for Android

Deploy Android apps to the Emulator

- Any AVD device

Deploy Android apps to the Device

- Debug
  - debug/deploy to device
- Ad-hoc
  - distribute APK anywhere
- App Store
  - deploy to an Android app store like Play or Amazon



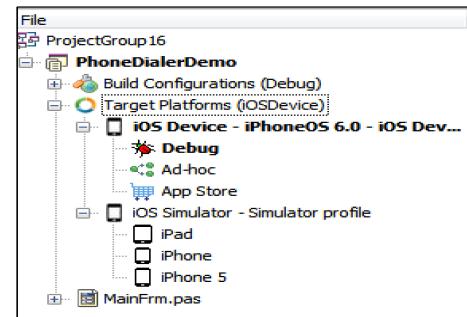
## IDE deployment options for iOS

Deploy iOS apps to the Simulator

- iPhone (Retina/non-Retina)
- iPhone 5 (Retina/non-Retina)
- iPad (Retina/non-Retina)

Deploy iOS apps to the Device

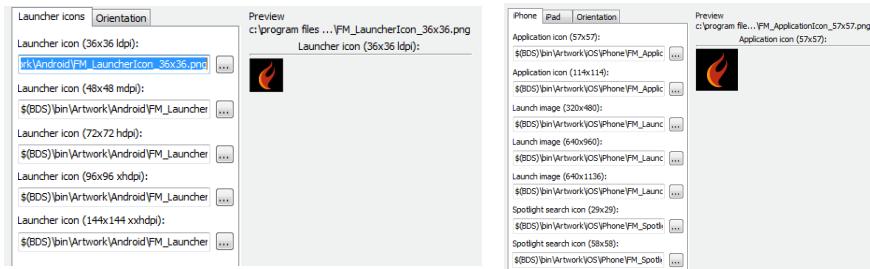
- Debug (debug/deploy to device)
- Ad-hoc (distribute within own enterprise)
- App Store (deploy to the App Store)



EMBARCADERO TECHNOLOGIES

## Defining Application Settings

- Define device support in Project->Options
- Select app icons for app stores (for multiple resolutions) in Project-> Options



EMBARCADERO TECHNOLOGIES

## Native Styling



EMBARCADERO TECHNOLOGIES

## Android Styles



72

- Holo Light (default Android style)
- Holo Dark (custom Android style)
- Both styles include built-in support for all resolutions supported on Android (1x – 3x)

The Embarcadero logo, which consists of the word "Embarcadero" in a bold, black, sans-serif font with a red "e" icon preceding it.

EMBARCADERO TECHNOLOGIES

## Native controls

- Message alerts
- Custom Picker
- Date Picker
- Phone Dialer
- iOS Keyboards
- Text Editing for TMemo and TEdit
  - Cut/Copy/Paste/Zoom

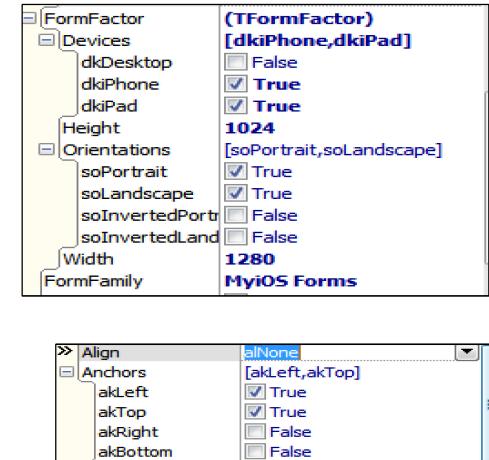


The Embarcadero logo, which consists of the word "Embarcadero" in a bold, black, sans-serif font with a red "e" icon preceding it.

EMBARCADERO TECHNOLOGIES

## Layout Management

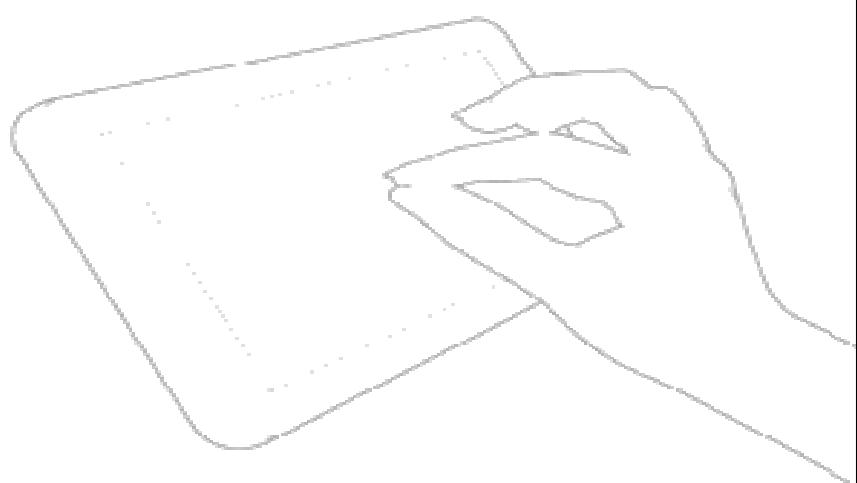
- Alignment
- Anchors
- Form Family for loading the correct form depending on the target device when developing different forms for phones vs tablets and Landscape vs Portrait



Embarcadero

## Gestures

- Swipe
- Tap
- Pinch & Zoom
- Tap & Hold
- Double-Tap



Embarcadero

EMBARCADERO TECHNOLOGIES

## Media Library Actions



- Accessing the Camera App
- Accessing the Camera Roll
- Sharing content i.e. photos via Message (SMS), Mail, Facebook, Twitter etc.
- Slide Transitions for Tabs



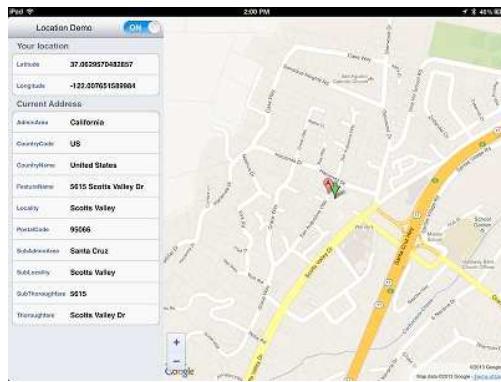
## Sensor Components

- Location Sensor (GPS)
- Motion Sensor (Accelerometer)
- Orientation Sensor (Gyroscope)



EMBARCADERO TECHNOLOGIES

## Location Sensor



Commonly used in applications that require location awareness

- Get location of your iOS device using latitude and longitude
- Use Reverse Geocoding to convert location data to a readable address
- Works across Win/Mac/iOS/Android
- Can be used with the WebBrowser component to display a location on the web

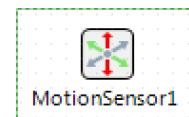
 Embarcadero

EMBARCADERO TECHNOLOGIES

## Motion Sensor (Accelerometer)

Used to detect motion in your application as you move your device

- Get Acceleration Values and Angle Acceleration Values (X, Y, Z)
- Determine Speed
- Determine Motion



 Embarcadero

EMBARCADERO TECHNOLOGIES

## Orientation Sensor (Gyroscope/Compass)

- Get X,Y,Z tilt values
- Get X, Y, Z distance values



The Embarcadero logo, featuring the word "embarcadero" in a lowercase sans-serif font with a small red "e".

EMBARCADERO TECHNOLOGIES

## Mobile Services

- Notification Center
- ... and more

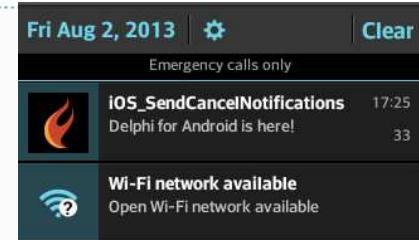


The Embarcadero logo, featuring the word "embarcadero" in a lowercase sans-serif font with a small red "e".

## Notification Center

- New FireMonkey Component in XE5
- Supports various notification types on iOS, Android and Mac OS X

```
procedure TForm1.ScheduleNotification;
var
  MyNotification: TNotification;
begin
  MyNotification := NotificationCenter1.CreateNotification;
  try
    MyNotification.Name := 'MyNotification';
    MyNotification.AlertBody := 'Delphi for your mobile device is here!';
    // Fired in 10 seconds
    MyNotification.FireDate := Now + EncodeTime(0, 0, 10, 0);
    // Send notification to Notification Center
    NotificationCenter1.ScheduleNotification(MyNotification);
  finally
    MyNotification.DisposeOf;
  end;
end;
```

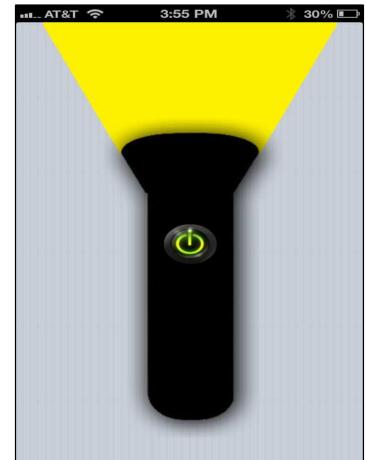


82

## Camera

Provides access to camera sensors:

- activate flash
- get sensor position etc.
- access front/back camera
- take pictures

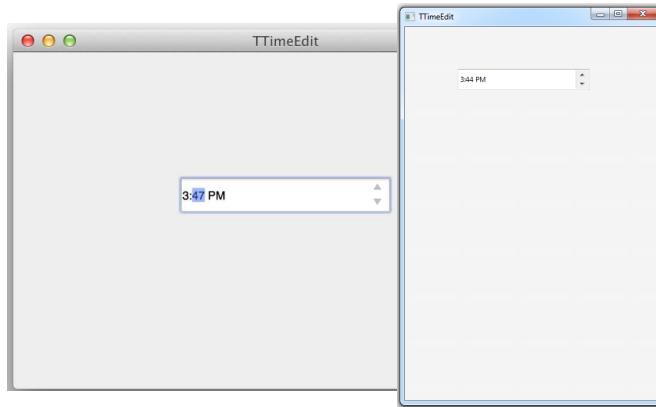


## TTimeEdit

- New FireMonkey Component in XE5
- Supported on Windows, Mac, iOS and Android
  - Native pickers on iOS and Android

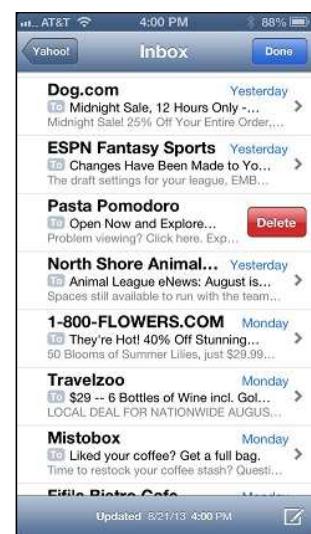


84



## TListView Features in XE5

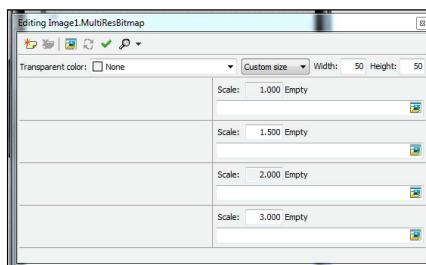
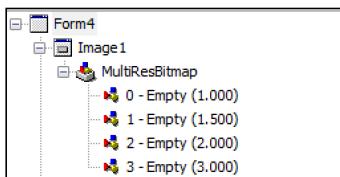
- Swipe to Delete functionality built-in
- Multiple Display and Edit Modes
- Various List Accessory Styles
- Edit Mode Animations
- Search filtering enabled
- LiveBindings enabled



## Multi-Resolution Image Support

- TImage has been updated
- MultiResBitmap property has been added
- 1x and 2x options are shown by default
- Users can easily add their own resolutions, i.e. 1.5x, 3x etc.

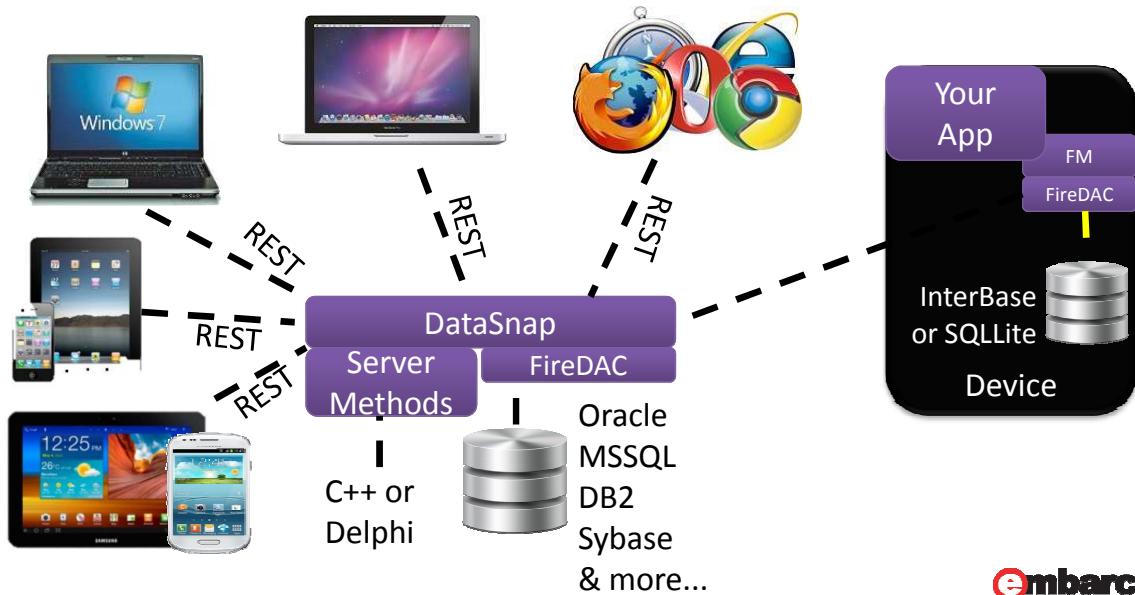
86



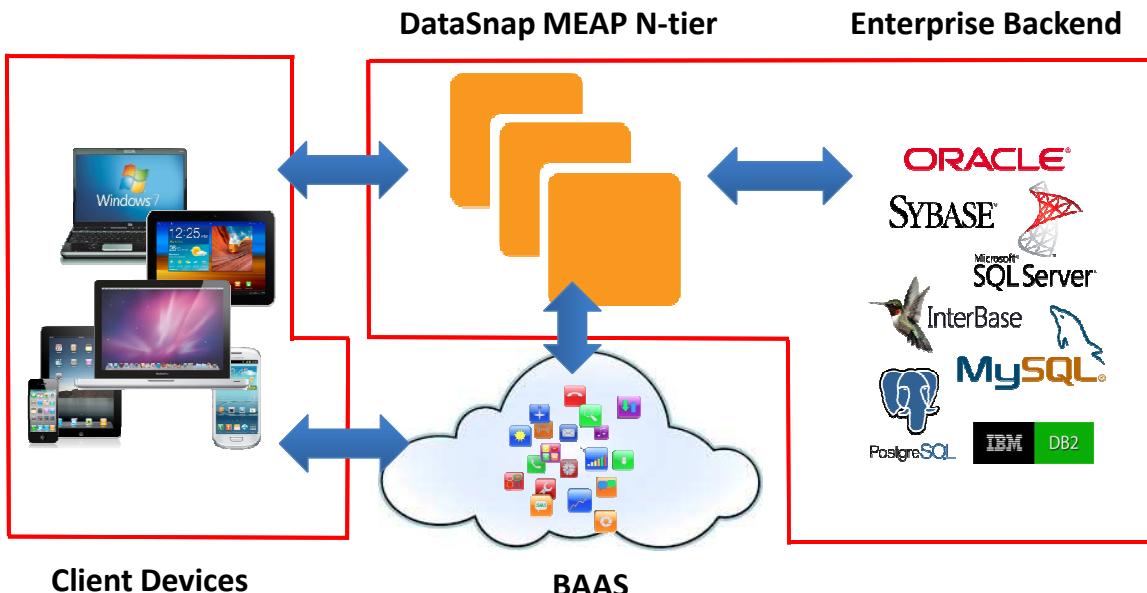
## More mobile Components

- **TWebBrowser** for embedded web browsing
- **TMagnifier** used with text editing, but can be used with other components as well
- **TCamera** - access front/back camera, flash etc.
- **TListBox** for short lists with no or minimal scrolling, header/footer/group/search styling
- **TListView** for long, scrollable, data-bound lists
- **TSwitch** for on/off selections
- **TProgressBar** for flexible progress control visualization
- **TSpeedButton** with variety of iOS-like icon options
- ... and more!

# Enterprise Ready

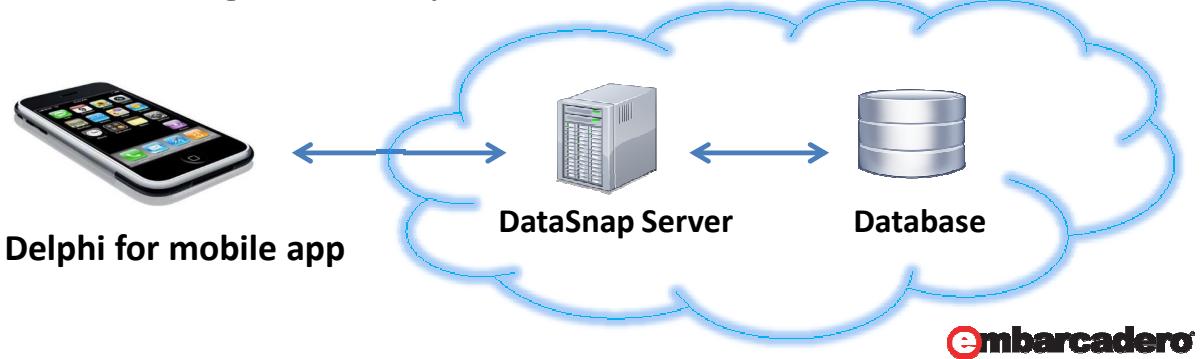


88



## Multitier with DataSnap

- Accessing remote on-premise or cloud-hosted services via REST/JSON or SOAP
- Connecting to Enterprise data from a mobile device



## FireDAC

- A set of Universal Data Access Components
  - for developing any database application
  - for Delphi and C++Builder
- High-performance, easy-to-use, enterprise connectivity
- Universal Data Access
  - But with many database specific features

## Local Databases

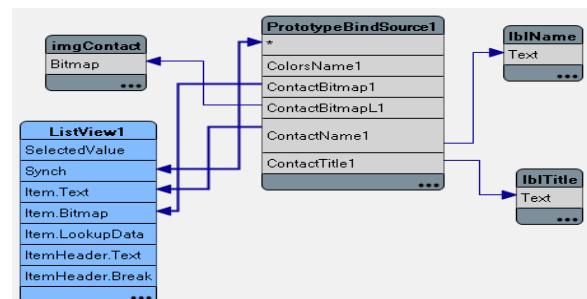
| SQLite              | IBLite                | InterBase ToGo        |
|---------------------|-----------------------|-----------------------|
| Free                | Free                  | Commercial            |
| Feature light       | Feature light         | Fully featured        |
| No security         | No security           | Secure Encryption     |
| Simple Data Storage | Full SQL-92 RDBMS     | Full SQL-92 RDBMS     |
| Single read/write   | Fast multi read/write | Fast multi read/write |



embarcadero

## Visual LiveBindings

- Bind controls to data
- Rapid Prototyping



embarcadero

## BaaS?

- Backend as a Service
  - REST client stack
  - BAAS abstraction
  - Kinvey implementation
  - Parse implementation
    - e.g Push Notifications



**Embarcadero**

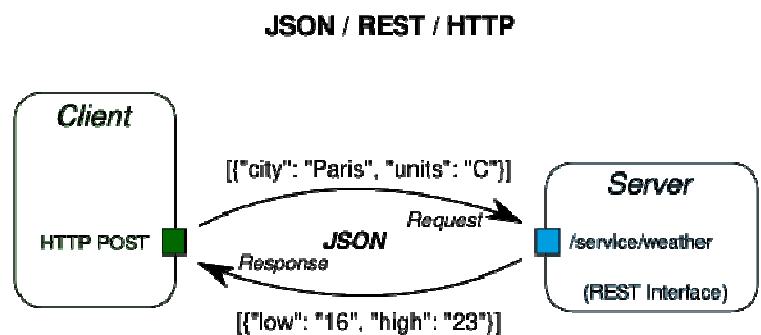
## XE5 REST Client Stack

- REST components
  - For developing REST client application
- RESTDemos.exe
  - Uses REST components to access a few different providers
- RESTDebugger.exe
  - Uses REST components to execute ad hoc requests

**Embarcadero**

## REST component features

- Comprehensive HTTP client
  - Asynchronous execution
  - Proxy connection
  - HTTPS
- Authentication
  - Basic, OAuth1, OAuth2
- JSON
  - Parsing, Formatting
  - JSON to TObject, TObject to JSON
- Rapid Prototyping
  - LiveBindings
  - Design time execution



**embarcadero**

**embarcadero**

## Summary

## Summary

**Multi-Device** means you don't have to support multiple development projects to deliver your app natively on multiple platforms (Android, iOS, Windows, and Mac).

**True Native** app development lets you deliver script-free device native apps optimized for each underlying hardware platform – creating faster, richer apps that end users love.

**The Fastest Way** to create iOS and Android apps with visual development using a complete application framework.

**Inherent Security** is built in with natively secure apps by coding your apps to run directly on the device and not using targeted virtual runtimes.

**Multi Device Enterprise Platform** means out of the box connectivity to major Enterprise database, on premise multi-tier middleware, and connectors to mBAAS services



## Summary: The multi-device world

- The multi-device world we live in... a situational analysis
- Stranded on the desktop!
- The 5 mistakes developers make when going mobile... and how to avoid them
- Getting to grips with multi-device, true native single codebase development

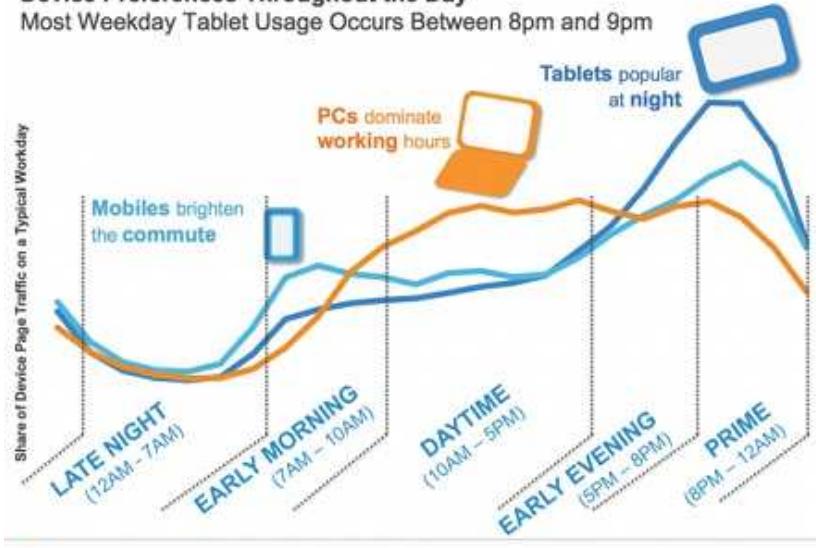


EMBARCADERO TECHNOLOGIES

## Apps for every device



### Device Preferences Throughout the Day Most Weekday Tablet Usage Occurs Between 8pm and 9pm



<http://www.smartsights.com/mobile-marketing/mobile-marketing-analytics/mobile-marketing-statistics/>

comSCORE

© comScore, Inc. Proprietary

Source: comScore Device Essentials, Monday, 21st January 2013, UK.

31

embarcadero®

embarcadero®

EMBARCADERO TECHNOLOGIES

## Thank you