embarcadero

Architecting C++ apps

with a multi-device application platform

John "JT" Thomas
Director of Product Management
jt@embarcadero.com
@FireMonkeyPM
blogs.embarcadero.com/jtembarcadero/

What is a multi-device application platform?

- Supports multiple client operating systems and form factors
- Manages data efficiently
- Exposes the Enterprise securely
- Integrates social and web services

Multi-Device Application Platform

Client Devices

MiddleWare

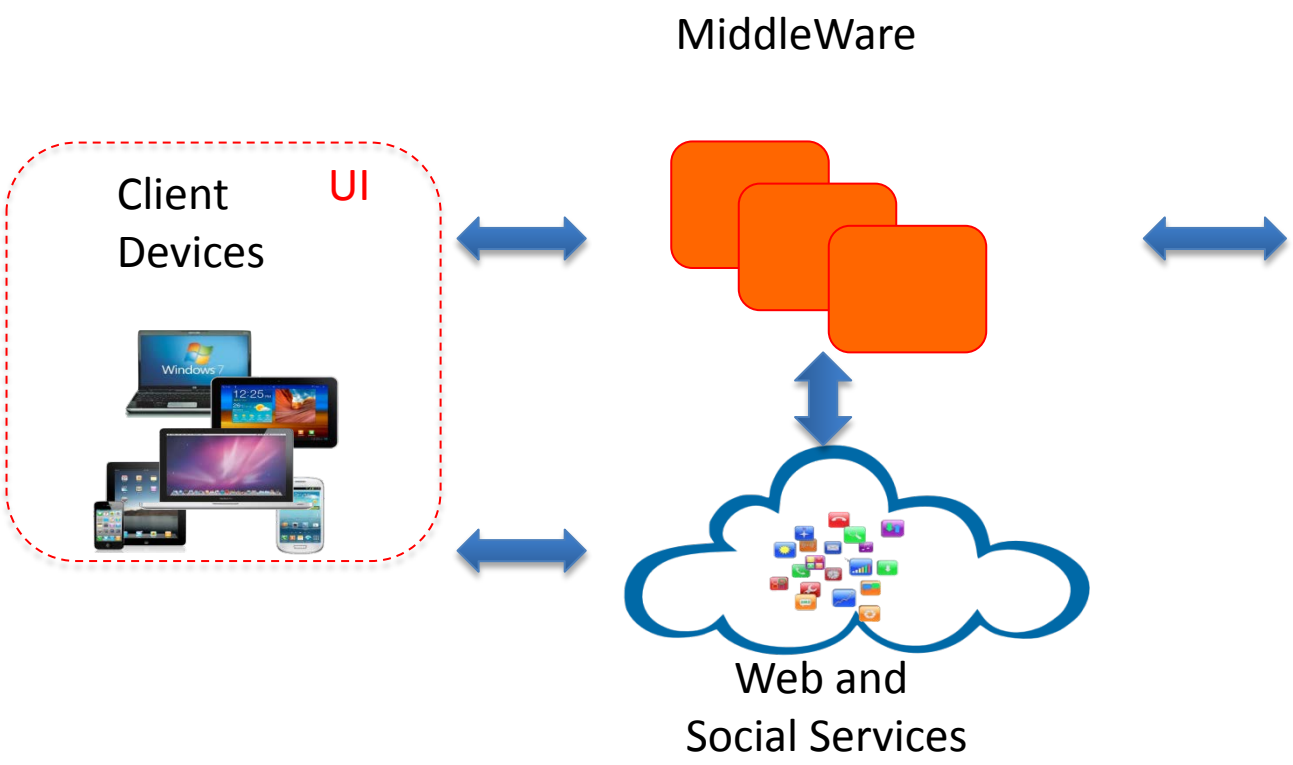
Web and Social Services

Database

ORACLE
SYBASE
Microsoft SQL Server
InterBase
MySQL
PostgreSQL
IBM DB2

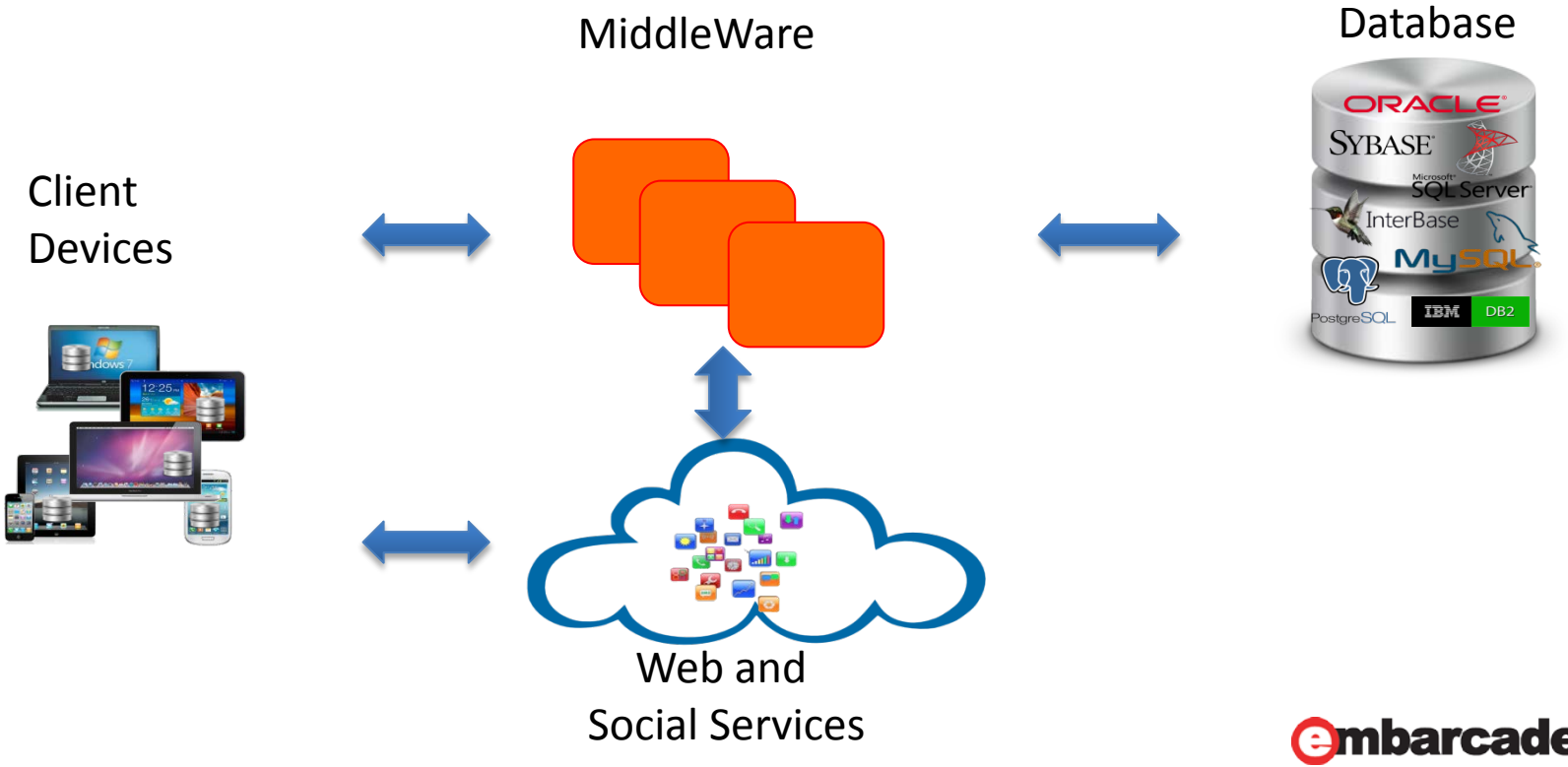
embarcadero

Multiple client OSs and form factors



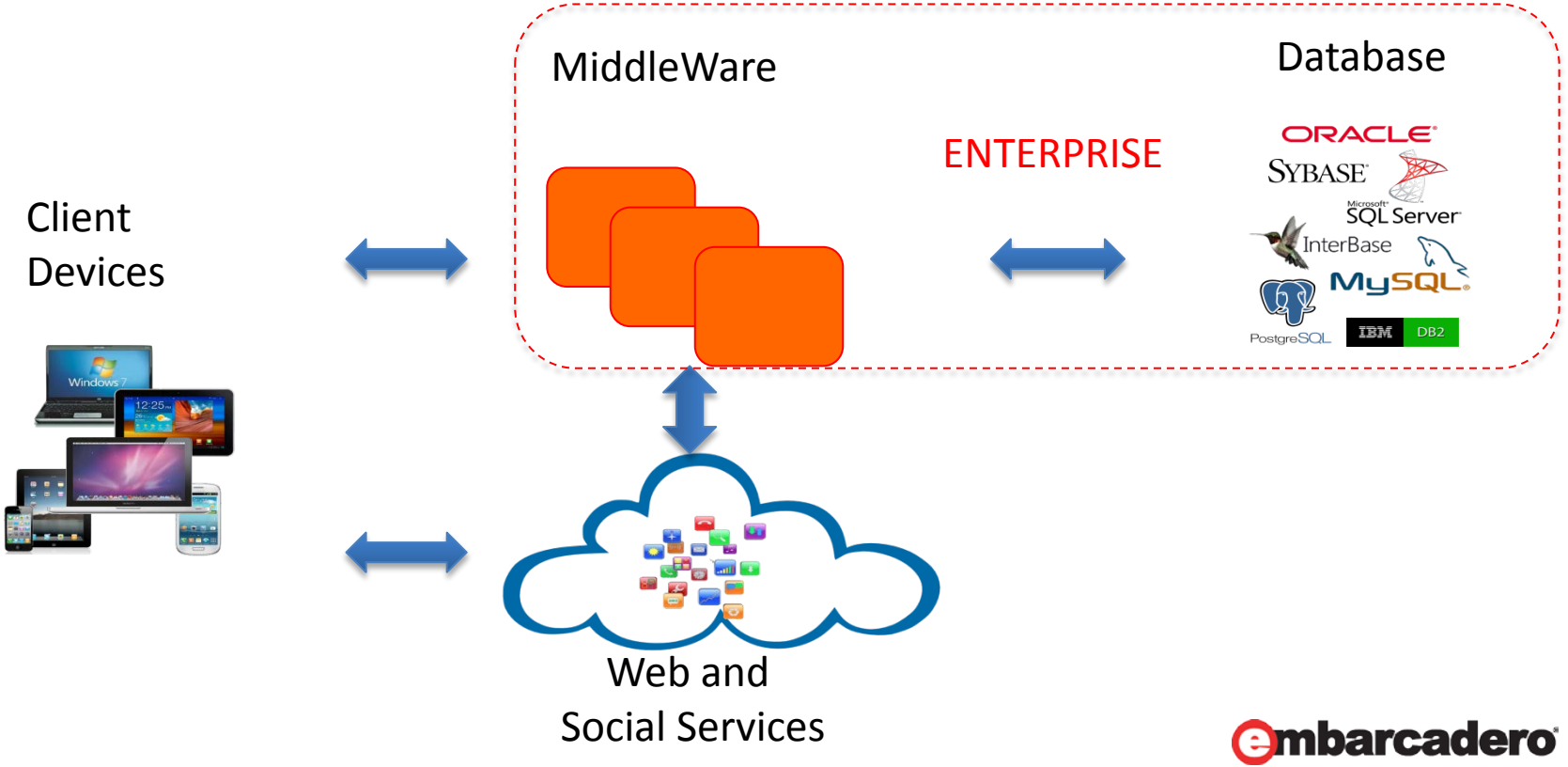
embarcadero

Efficient and Secure Data



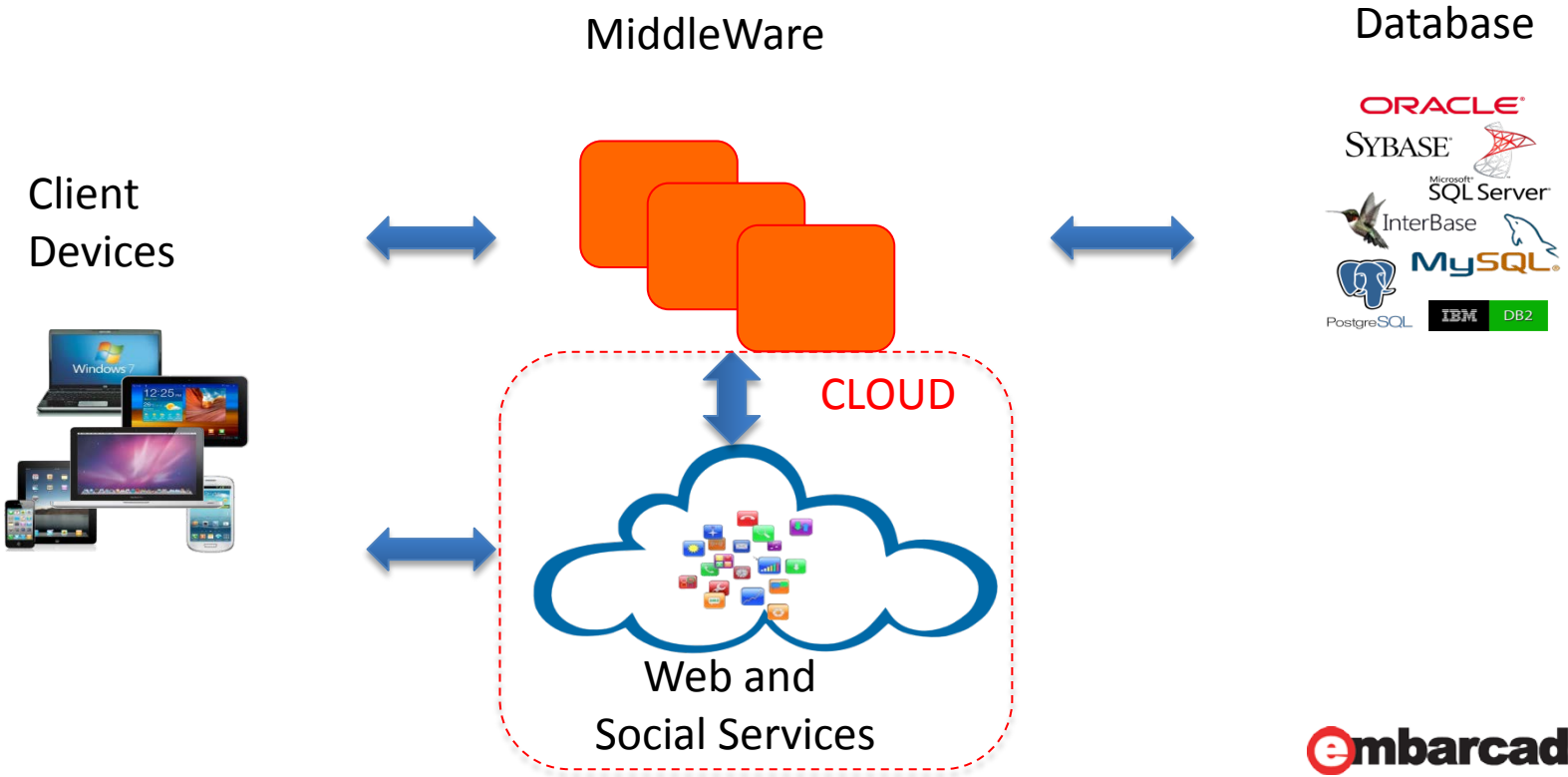
embarcadero

Securely Exposed Enterprise



embarcadero

Integrated web and social services



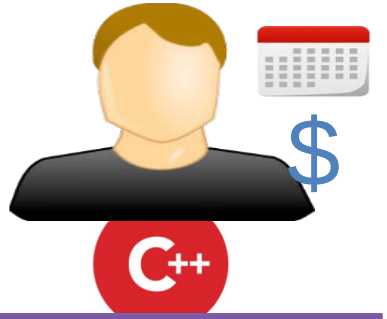
API	Description	Embarcadero Technology
UI	Windows Mac OS X iOS Android*	FireMonkey
DATA	Storage SQL Encryption On Device Private Cloud Service Public Cloud Service	InterBase
ENTEPRISE	Enterprise Data Service Private API Hosting	DataSnap FireDAC
CLOUD	REST Connectivety Web (Public) API Service Social Network Integration Mobile Backend as a Service	REST FM

UI

FIREMONKEY

Multi-Device with RAD Studio XE5

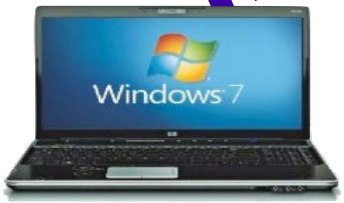
One team
one codebase



C++ Source Code

FM Application Platform

Future

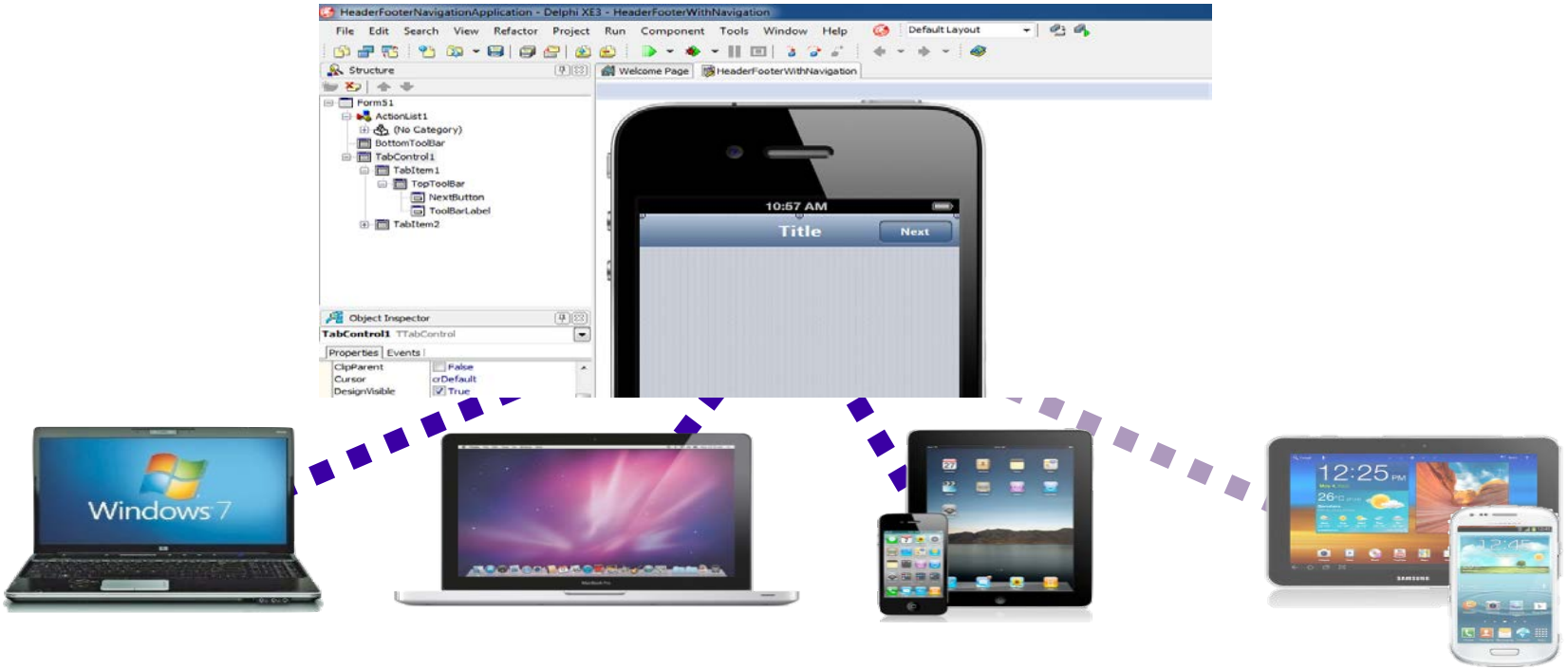


embarcadero

True Native Code

- True native apps in RAD Studio are script-free and run directly on hardware CPU delivering the following advantages:
  - Fast – Uncompromised native device performance with full native API and CPU control when needed, and not limited by or slowed by script interpreters and VMs.
  - Predictable – Apps run directly on the device CPU, as intended by the device vendors, and are not slowed by additional software layers and random garbage collection.
  - Better User Experience (UX) – Apps take full advantage of device capabilities and performance.

The Fastest Way to develop Windows, Mac OS X and iOS apps in C++



embarcadero

embarcadero

DATA

INTERBASE

On Device Embedded 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

ENTERPRISE

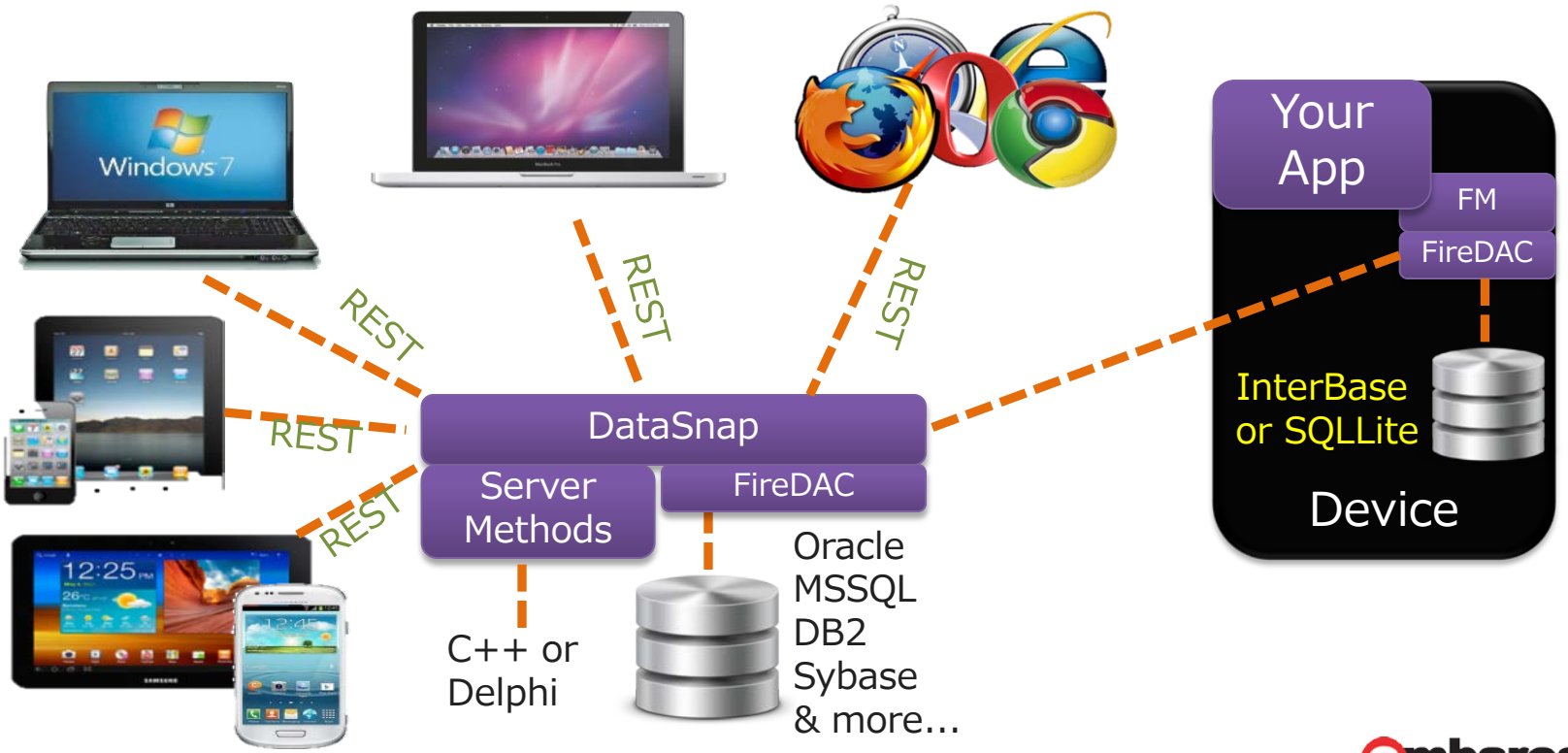
FIREDAC

DATASNAP

FireDAC

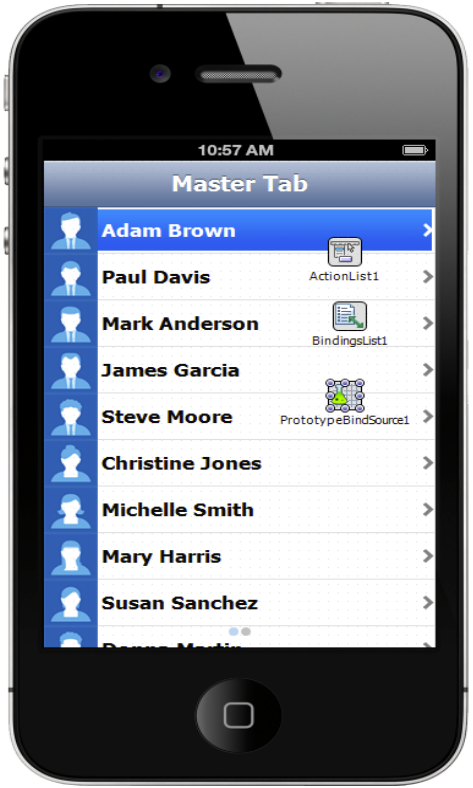
- A set of Universal Data Access Components
  - for developing any database application
  - for Delphi and C++Builder
- High-performance, easy-to-use, enterprise connectivity
- Universal Data Access
  - With many database specific features

Enterprise Ready

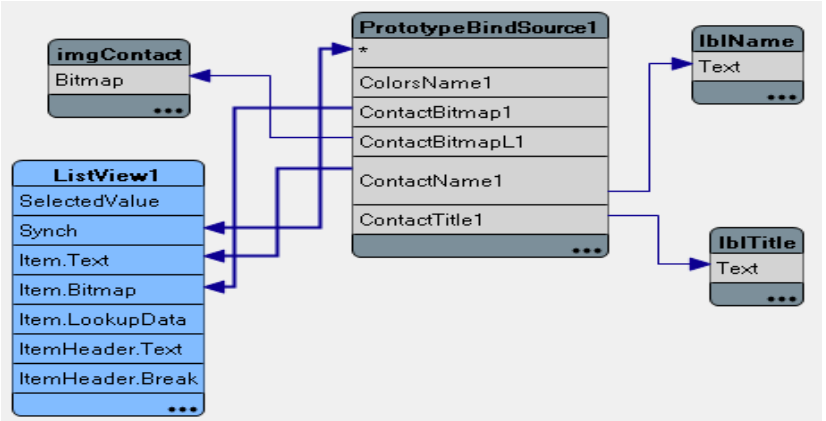


embarcadero

Visual LiveBindings



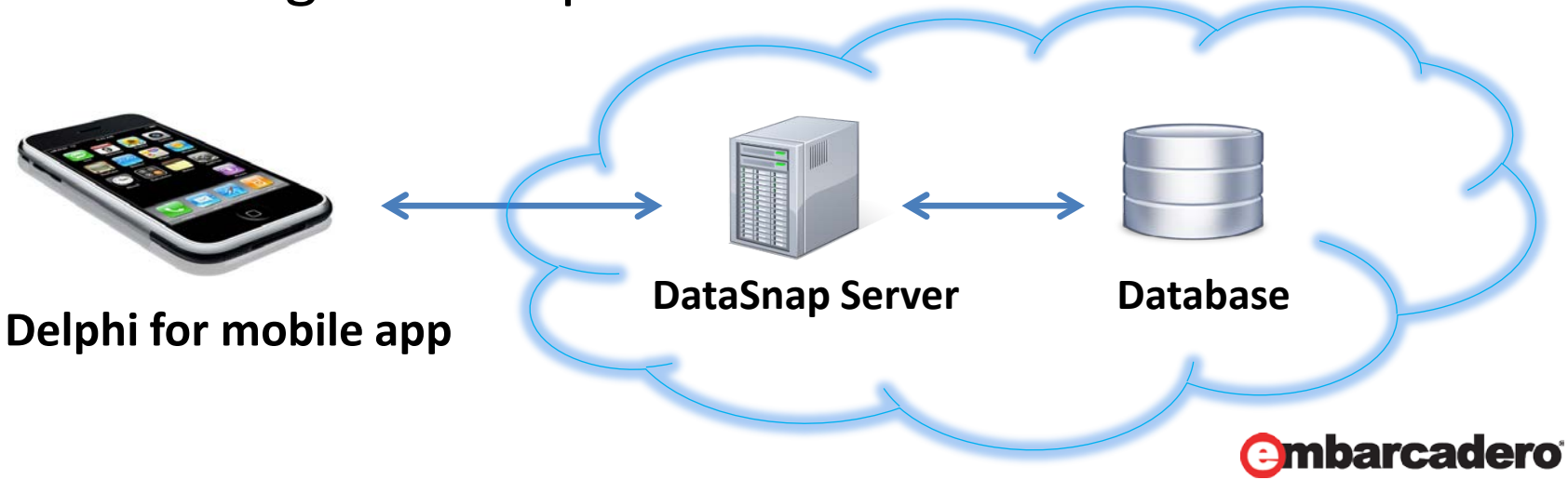
- Bind controls to data
- Rapid Prototyping



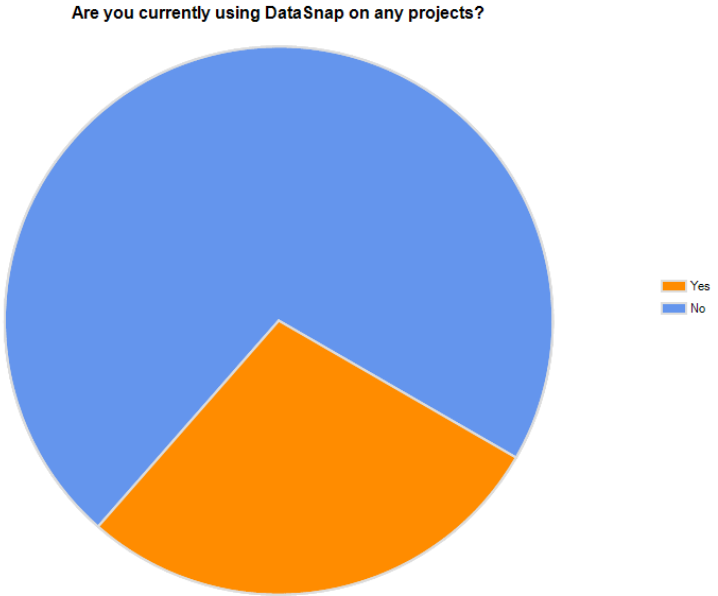
embarcadero

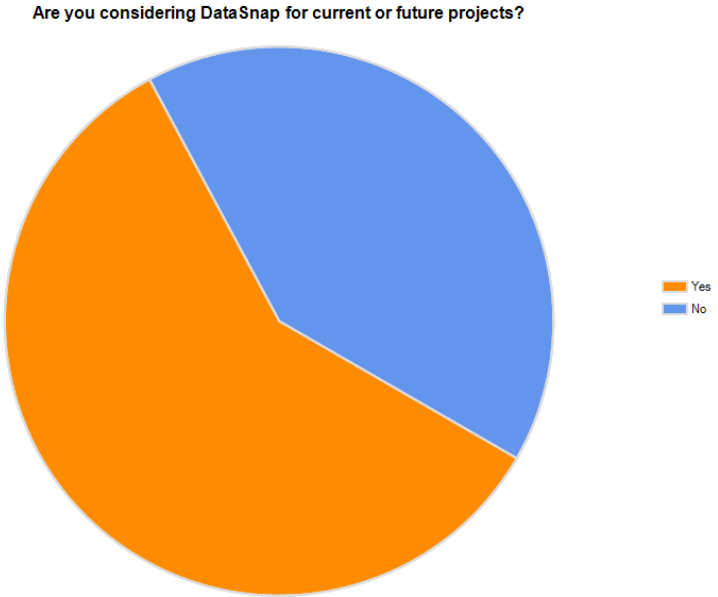
Multitier with DataSnap

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

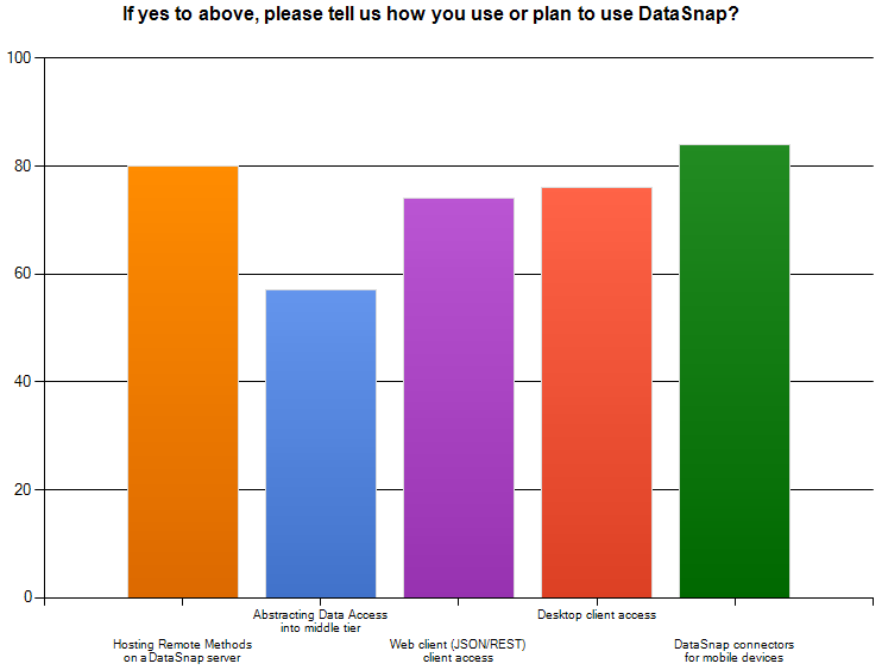


DataSnap Usage Metrics





DataSnap app types

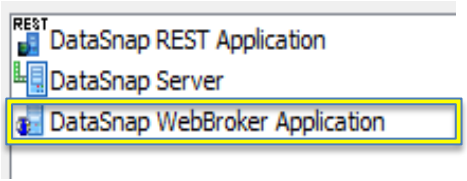


DataSnap Best Practice

- HTTP REST connectivity
- ISAPI / Microsoft IIS
- Asynchronous, session-less connections
  - Provides the highest scalability and load balancing support

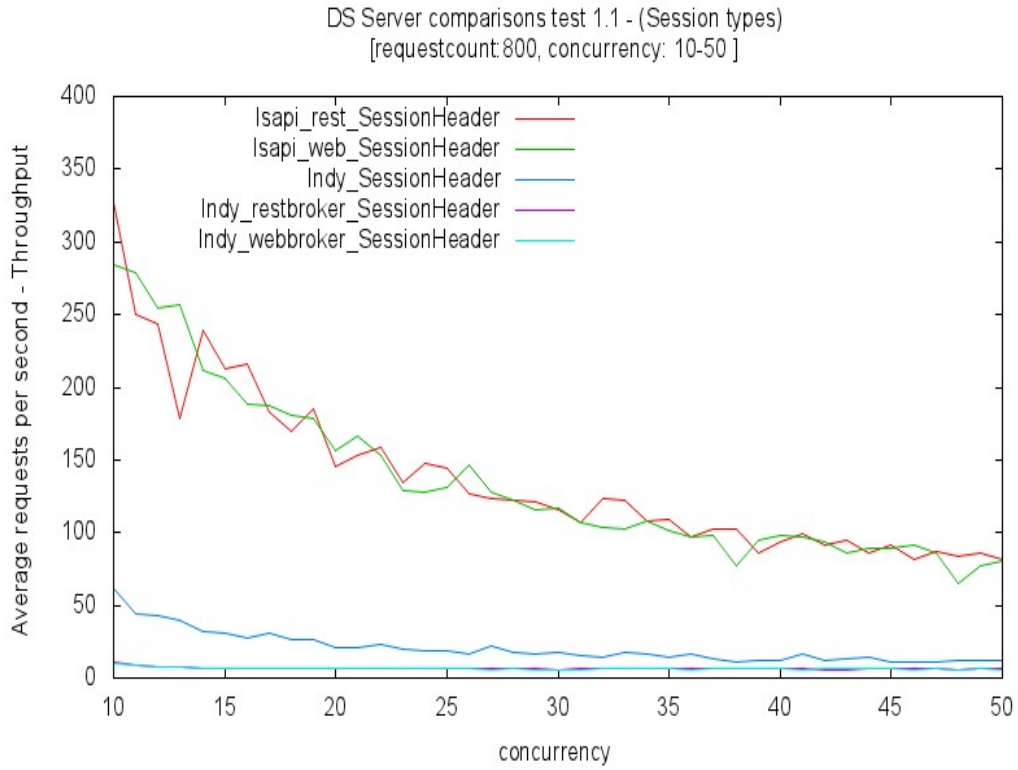
Type of DataSnap Server / Project

- DataSnap REST App and WebBroker App use the same infrastructure
  - Different default options, JavaScript deployment



- Use IIS as target
  - But development can be done with a local Indy server (best for debugging)
  - Indy throughput can be improved with thread caching

IIS vs. Indy Throughput



embarcadero

TDSServerClass LifeCycle Options

- Server lifecycle only for global objects
  - Need to be protected against concurrent access
- Session lifecycle
  - For a REST application falls back to invocation
- Invocation lifecycle
  - This is the fully stateless approach, recommended for better scalability
  - User database connection caching / data caching if needed

Configuration of Application Layer

- Delphi open to different alternatives
  - Subject to the application approach and architecture
- Simpler logic or business logic in SQL layer, just handle datasets directly
- More complex business logic could benefit from an object layer (ORM)
- FireDAC is the recommended data access technology

Data Set Caching in Middle Tier

- Global vs. Session data
  - If there are two many sessions, session data can grow
  - Session data prevents load balancing on multiple server
- Read-only vs. Read-Write data
  - Read only: concurrent access is quite simple
  - Read-write: must implement concurrency, transaction, persistence in case of crashes, write conflicts… which a database does for you

Caching and Optimizations

- HTTP level caching
  - Return the same response for a given time
    - (in DataSnap or Web Server level ie. IIS)
- Client caching / delta request
  - Client can keep data around, query for updates rather than complete tables
- Speed database connection
  - Proximity (high speed connection)
  - Connection caching
  - RDBMS access generally much faster than remote client access

embarcadero

CLOUD

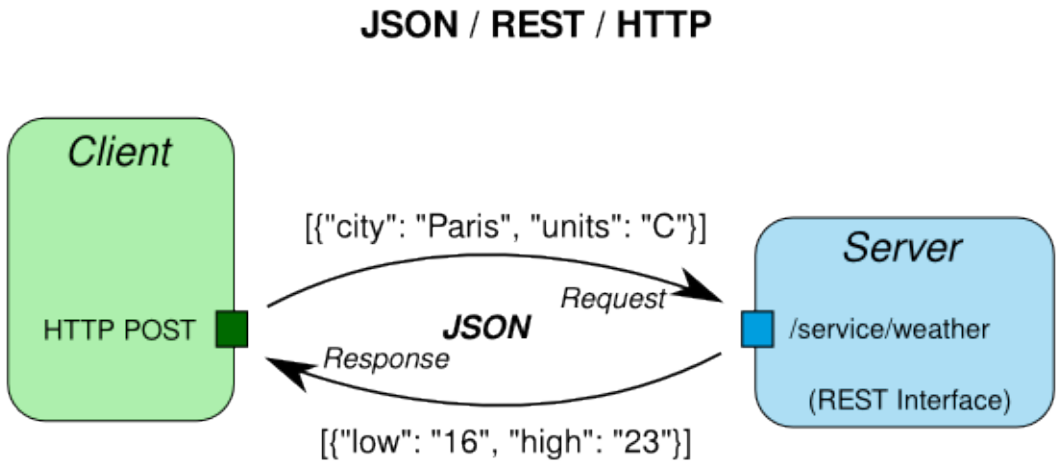
REST FM

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

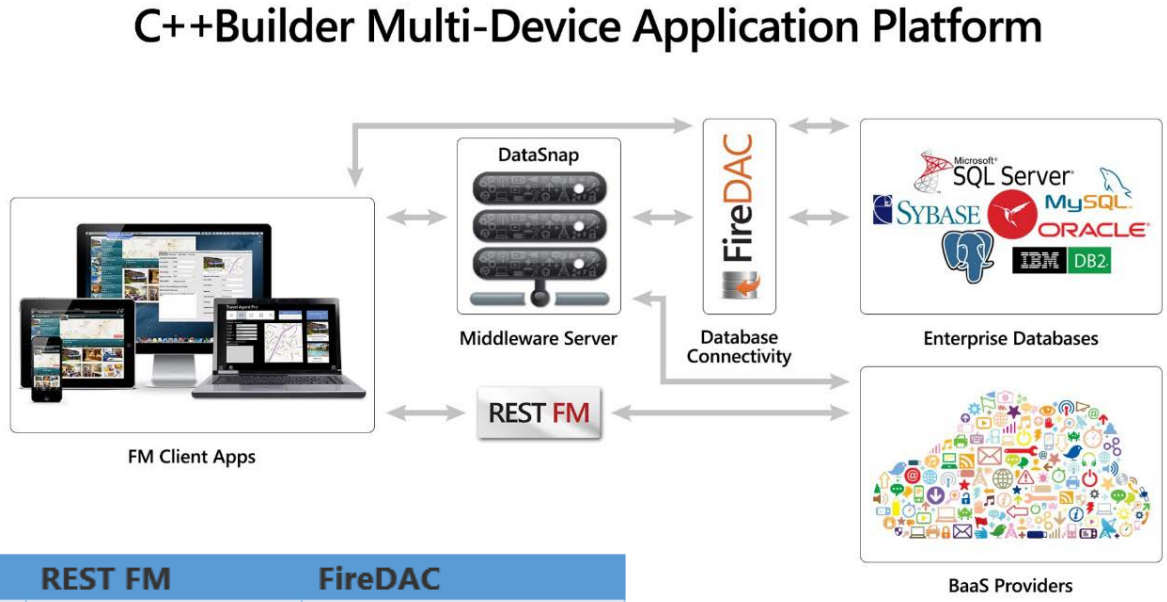
REST component features

- 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



Deliver truly connected applications

With C++Builder's Multi-Device Application Platform, you can deliver truly connected applications that support real time communication and access to enterprise data and cloud services.

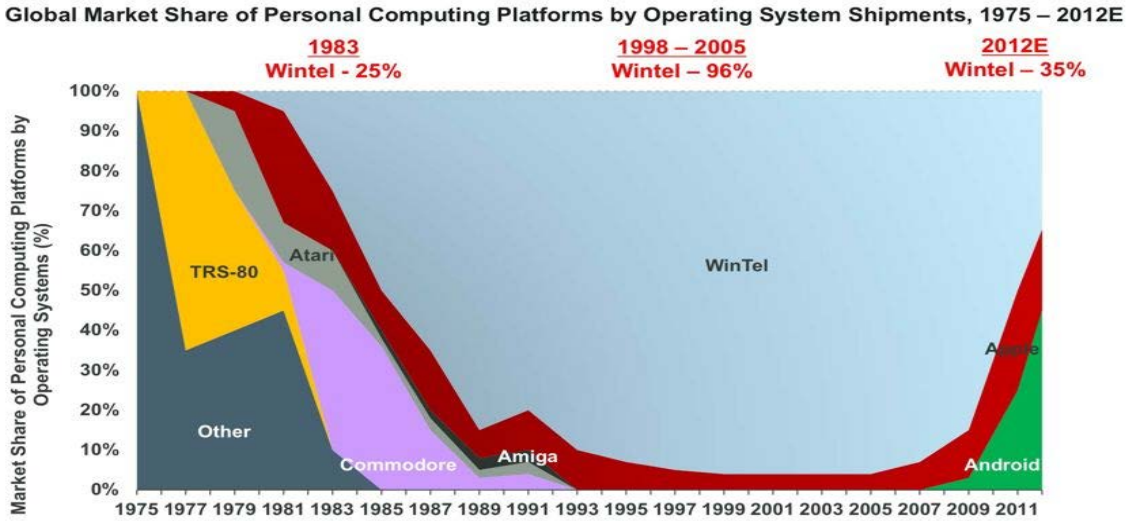


FM App Platform	DataSnap	REST FM	FireDAC
Create client apps for Windows, Mac and mobile	Build custom middleware servers	Access cloud based RESTful web services	Connect with local and enterprise data sources

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.

An Unprecedented Multi-Device Landscape

embarcadero

embarcadero

Questions

どうもありがとうございました。

Doumo Arigatou Gozaimashita