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Symbian Developer Network

Developer essentials for Symbian OS

symbian

Overview

1. Choosing a language
2. Tooling up
3. Which APIs can I use?
4. What's new for developers in v8.x?

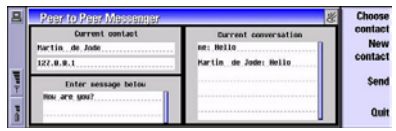
1 - Choosing a language

What languages can I develop in?

	Compiled	**Scripting**
Targeted to Symbian OS phones	C++	OPL
Multi-platform	Java, VB.NET	XML, SMIL, Simkin

C++ platforms

- C++
  - …Series 90
  - …UIQ
  - …Series 60
  - …9200 Series / Series 80



Java platforms

- Personal Java (+ JavaPhone)
  - …9200 Series, UIQ
- MIDP (CLDC)
  - …Series 60, Series 80, Series 90, UIQ
- Personal Profile (CDC)
  - …Series 80
- DoCoMo Java (DoJa)
  - …FOMA phones

Other languages

- **OPL** (http://opl-dev.sourceforge.net/)
  - … Open-source runtimes available for
    - *9200 Series*
    - *Series 60 (alpha)*
    - *UIQ (beta)*
- **Visual Basic** (http://www.appforge.com/)
  - … "Crossfire" solution integrates with Visual Studio.NET, supporting
    - *9200 Series / Series 80*
    - *Series 60*
    - *UIQ*

2 - Tooling up

What software do I need for C++ development?

- . . . Symbian OS SDK
  - www.symbian.com/developer/sdks/
  - PC-based emulation
  - build/deployment tools
  - docs + examples

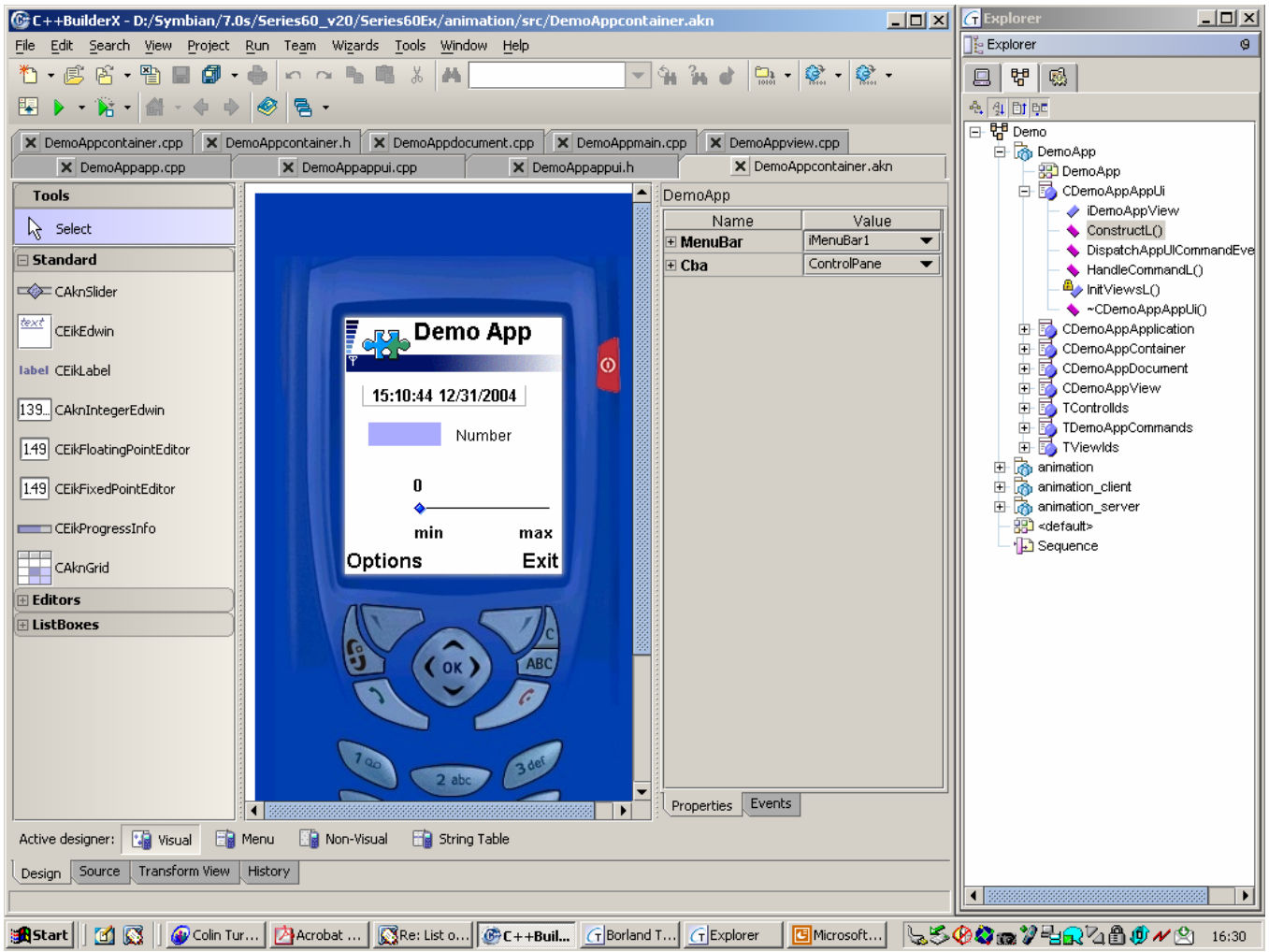
Tools for app development

- Commercial products
  - Metrowerks (C++)
    - *CodeWarrior Development Studio for Symbian OS*
      - Personal edition
        - Hosted debugging
      - Professional edition
        - On-target debugging
  - *Borland (C++/Java)*
    - Mobile Studio
    - Enterprise Studio for Mobile
- Free products
  - *Eclipse (C++/Java)*
  - *Open QUB (C++ RAD tool for UIQ)*

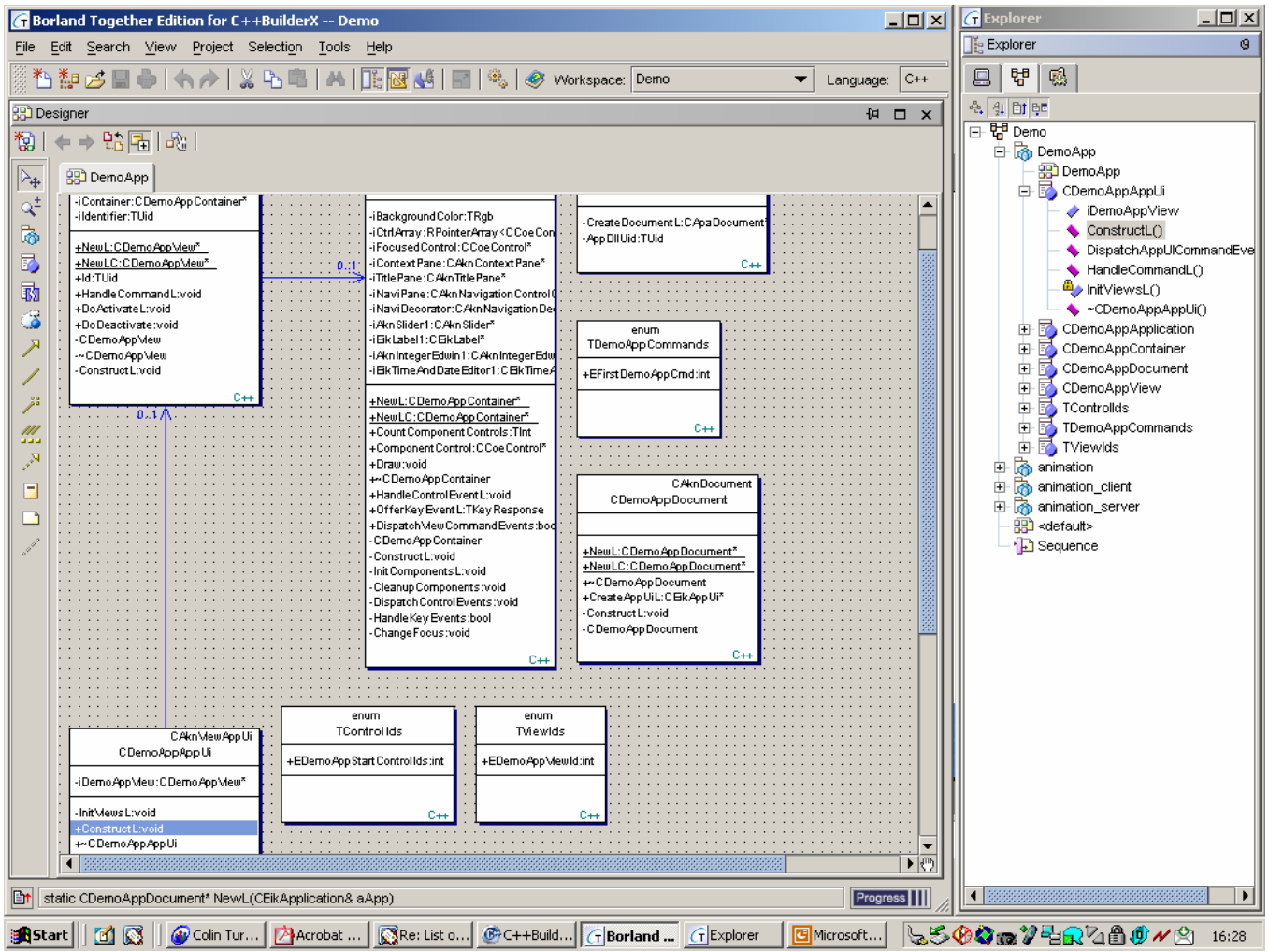
Tools for system & middleware development

- Symbian OS DevKit
  - . . . can be licensed by Platinum Partners
  - . . . Symbian OS source code
  - . . . in-depth engineering documentation
  - . . . ROM building tools
- CodeWarrior IDE, OEM edition
  - . . . JTAG debugging support
  - . . . profiling

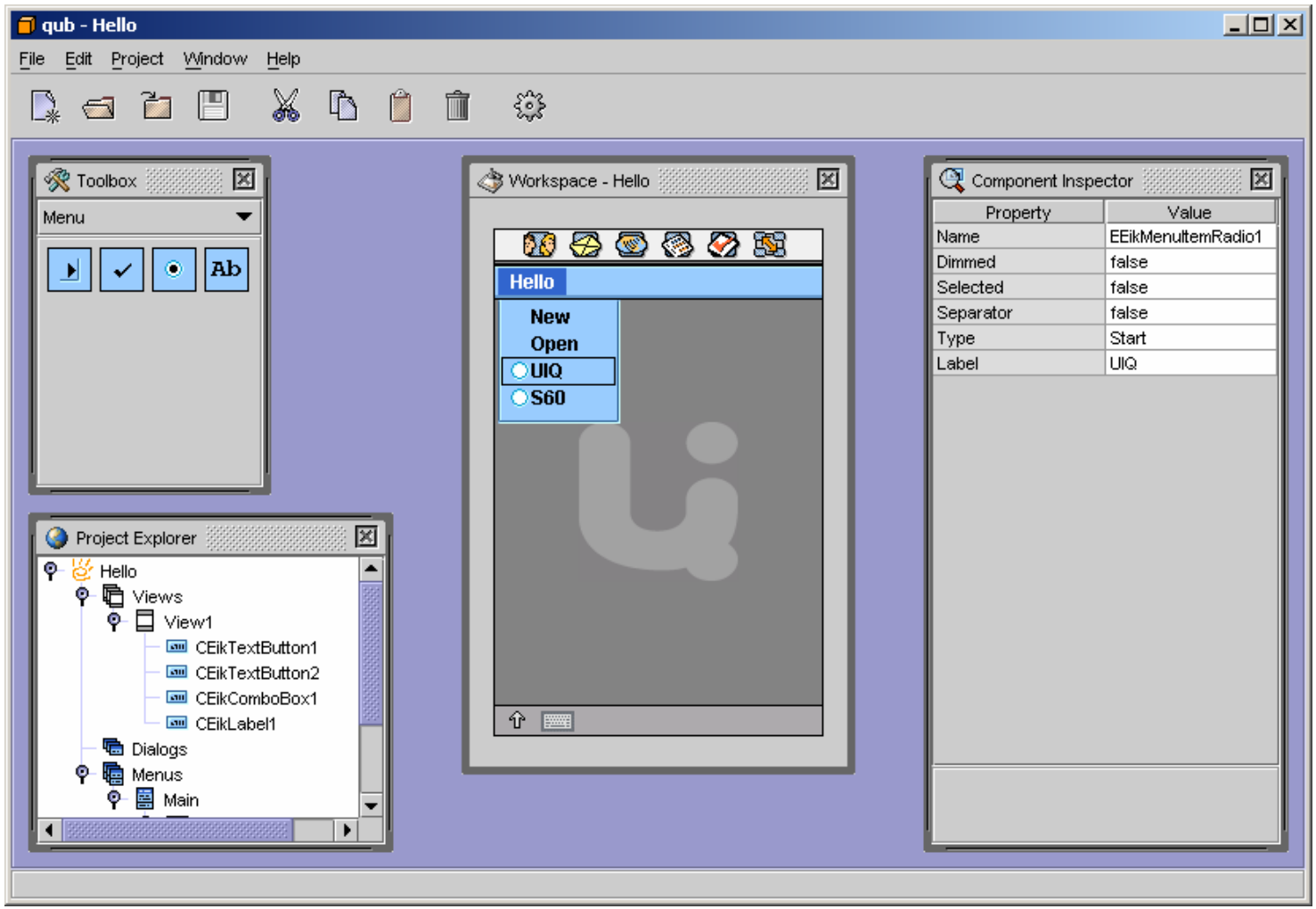
Borland Enterprise Studio for Mobile (Series 60 visual designer)



Borland Enterprise Studio for Mobile (UML view)

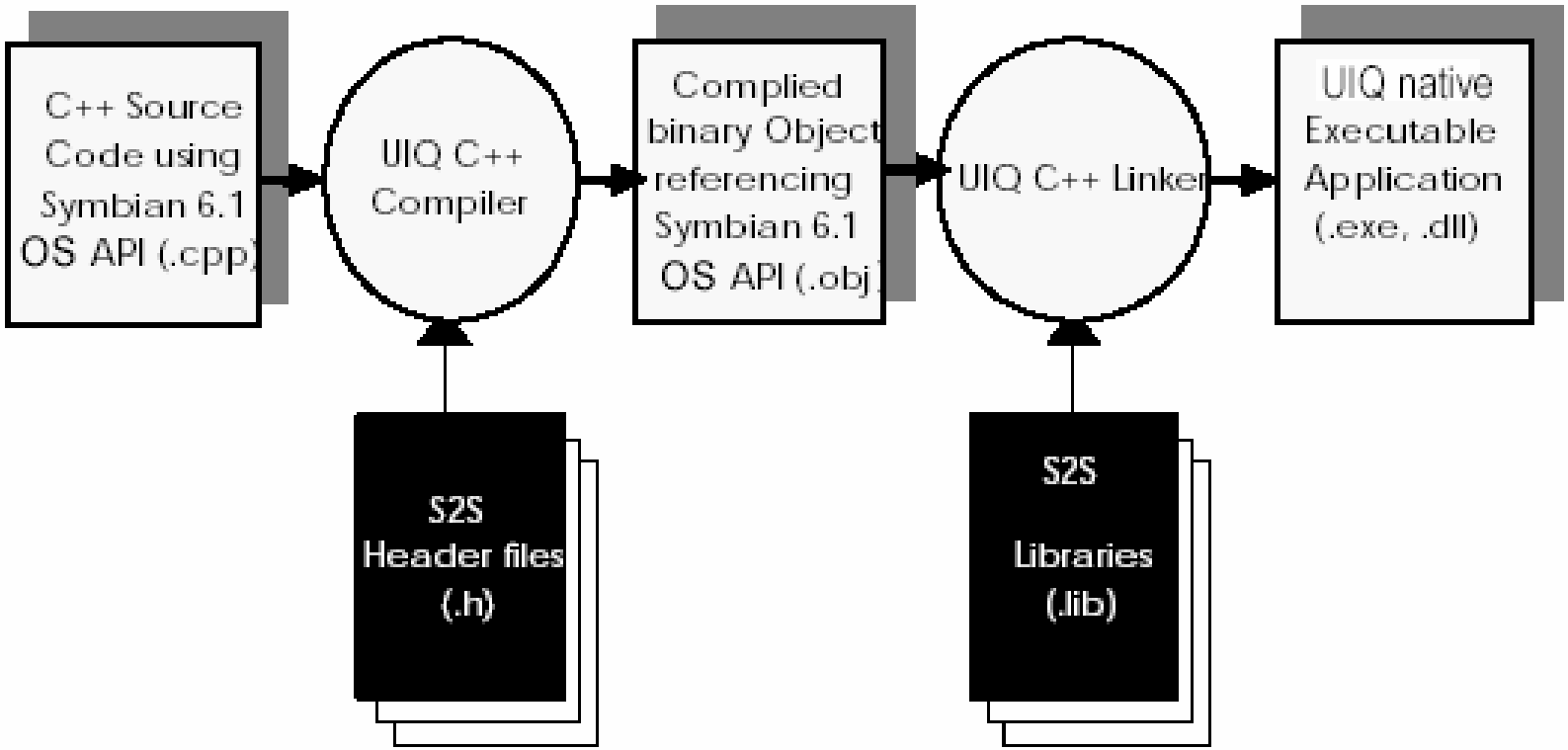


Open QUB (Visual development tool for UIQ)

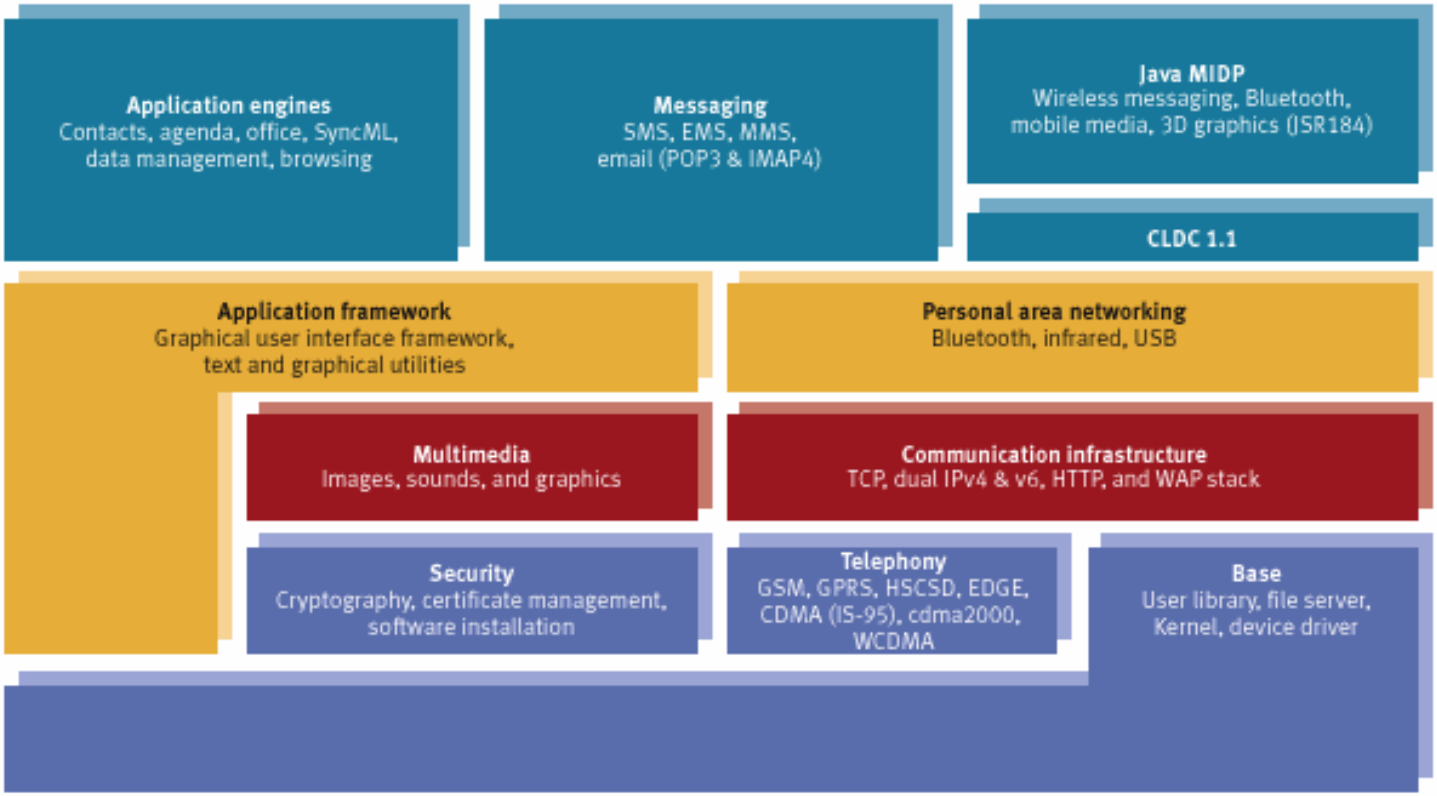


Peroon “DIMA” – automated porting (www.peroon.co.il)

e.g. from Series 60 to UIQ



3 – Which APIs can I use?



Symbian OS v8.0 architecture

Platform SDKs and phones

- Symbian OS defines the core APIs (~80%) in any platform SDK or phone

<table>
<tr><td>Nokia 9210, 9290</td><td>Nokia 7650</td><td>Sendo X</td><td>Siemens SX1</td><td>S-E P900/ P910</td><td>Moto-rola A1000</td><td>Nokia 6620, 9500</td><td>Nokia 6630</td></tr>
<tr><td>9200 Series</td><td colspan="3">Series 60</td><td colspan="2">UIQ</td><td>Series 60, 80</td><td>Series 60, 80, 90</td></tr>
<tr><td colspan="8">v6.0 v6.1 v7.0 v7.0s v8.x

Symbian OS</td></tr>
</table>

Which APIs where?

- Public C++ APIs are well-defined
  - …System architecture papers
    - www.symbian.com/developer/techlib/papers/cpp_sysarch.html
    - “Symbian OS System definition”
    - “Symbian OS System definition – detailed view”
  - …Symbian Developer Library
    - “API Reference”

→ work out which *Symbian OS* APIs are supported on which phone!

4 - What's new for C++ developers in Symbian OS v8.x?

- Telephony
- Graphics
- IPC mechanisms
- XML parser
- Strong stream encryption
- API tagging
- Bluetooth and networking
- Local time synchronization

3rd party telephony API (from v7.0s)

- Easy API for core telephony services
- What's my number?
  - … IMEI, IMSI, own phone number
  - … caller ID
- Network info
  - … Flight mode status, network availability, signal strength, network registration status
- Location
  - … Area code and cell ID
- Others
  - … Battery status, DTMF tone generation

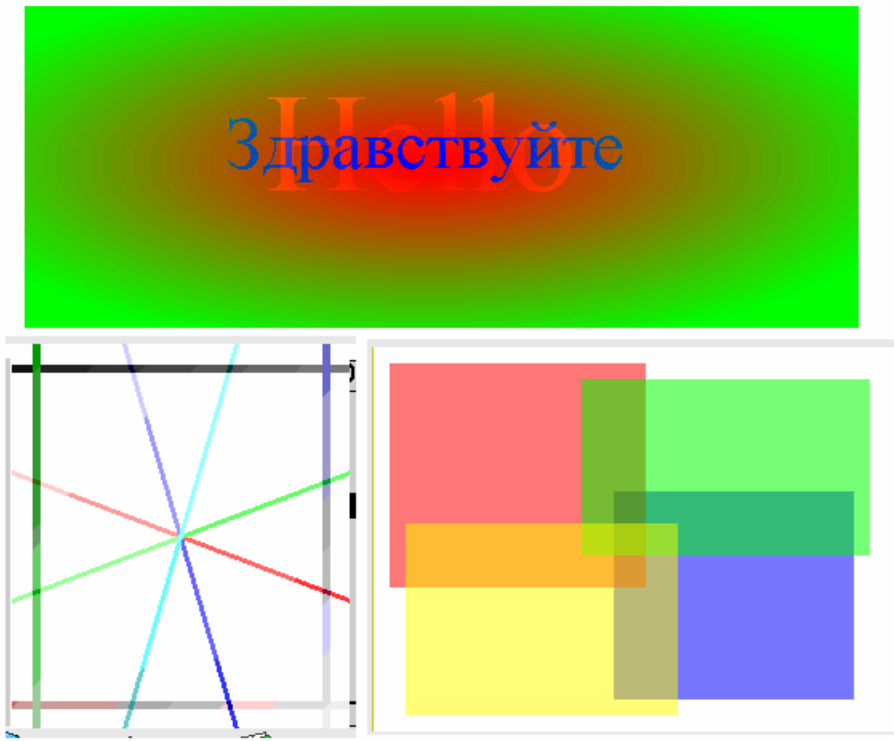
Semi-transparent windows/dialogs (from v7.0s)

Four new methods:

```
1 void RWindow::HandleTransparencyUpdate();
2 TInt RWindow::SetTransparencyFactor(
      const TRgb& aTransparencyFactor);
3 TInt RWindow::SetTransparencyBitmap(
      const CFbsBitmap& aTransparencyBitmap);
4 void RWindow::SetNonTransparent();
```

Extended to stretched bitmaps in v8.1

Semi-transparent window - example



IPC mechanisms

Publish and Subscribe:

- system-wide global variables
- peer-to-peer inter-process communication
- User- and Kernel-side API

Message Queue

- Classic reader/writer paradigm
- Share data processing between threads

XML parser framework (from v7.0s)

- Unified API to support all XML parser capabilities
- Based on ECOM plug-in framework
- Implementations provided for
  - Text XML parsing
  - Binary WAP XML parsing

Strong stream encryption (from v7.0s)

- Public API for strong encryption of streams
  - Enhancements to **`REncryptStream/RDecryptStream`**
  - Implements a strong symmetric cipher
  - User password based

API tagging (from v7.0s)

- Introduction of API tagging with clear indication of the access status and release status for each API clearly indicated in the header file.
  - Access status:
    - @internalTechnology, @internalComponent, @internalAll, @publishedPartner, @publishedAll
  - Release Status:
    - @prototype, @released, @deprecated, @removed, and @test

3D graphics OpenGL ES API (from v8.0)

- Public API for OpenGL ES 3D graphics library
  - … version 1.2.1
  - … platform-independent API
  - … Open GL ES types #def''d to Symbian OS types
  - … prototype in v8.0
- Reference implementation available to licensees
  - … Suitable for inclusion in SDKs
- Accessible also through Java API
  - … JSR184

Bluetooth extensions (from v8.1)

Bluetooth Personal Area Networking

- Ad-hoc IP based connectivity over L2CAP
- Connect phones, PCs and Apple iMACs
- No PPP service required

Bluetooth 1.2 L2CAP flow and error control

- run simultaneously applications with different link requirements:
  - e.g.,reliability, packet size

Graphics enhancements (from v8.1)

Screen Scaling and Positioning

- Allows for legacy applications written for a smaller screen size to be run on a larger screen size and positioned appropriately.

Scalable Application Icons

- Scalable application icons extends vector graphic support in the UI layer for icons and text.

Multi-port USB (from v8.1)

- Multiple ACM ports are supported over USB
  - Particularly useful when connecting a phone to the emulator

Synchronisation using universal time (from v8.1)

- Provides conversion services between UTC and local time (including allowance for Daylight Saving Time)
- Enables interworking with UTC to support syncing with Notes and Outlook.

So remember…

- Plenty opportunities for app development on Symbian OS phones
- You can use C++, Java and other languages
- Watch out for phones based on v8.x!