
Introduction To The S60 Scalable UI

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S60 p l a t f o r m

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Change History

September 16, 2004	Version 1.0	Initial document release
October 11, 2004	Version 1.1	References to screen resolution 208x208 removed.
January 18, 2005	Version 1.2	Correct SDK API names added
November 2, 2005	Version 1.3	Minor terminology update

1. Introduction

S60 2nd Edition, Feature Pack 3 introduces new screen resolutions and APIs to support the scalable UI. In order to implement applications for the scalable UI, developers must take different screen resolutions into account.

In addition, a scalable graphics format will be introduced for icons and themes.

2. New Screen Resolutions

Applications implemented for S60 2nd Edition, Feature Pack 3 and later should scale to all of the supported resolutions. In addition to the 176 x 208 resolution currently in use, two new resolutions are now available. From this point on, S60 devices may use one of the following screen resolutions:

- 176 x 208 – standard
- 240 x 320 – Quarter VGA (QVGA)
- 352 x 416 – double

In addition to the traditional portrait layout, a landscape layout is supported in the double resolution (352 x 416) and QVGA (240 x 320) modes. However, not all S60 built-in applications support landscape mode yet.

3. New C++ APIs

The following new APIs have been introduced to allow the development of applications for scalable UIs:

- UI Metrics API

The API provides layout information about the UI component (size, position, etc.). The UI Metrics API is part of the Utilities API under the UI Framework in the SDK help. The term UI Metrics API does therefore not appear in the SDK help.

- Orientation Mode API

The API provides `set` and `get` methods for the orientation mode (portrait or landscape). The Orientation Mode API is part of the Application framework API under the UI Framework in the SDK help. The term Orientation Mode API does therefore not appear in the SDK help.

- Scalable Icons API

The API is used to create scalable icons. The Scalable Icons API is part of the Skins API under the UI Framework in the SDK help. The term Scalable Icons API does therefore not appear in the SDK help.

- Logical Font API

New logical fonts are defined to get suitable fonts regardless of the current screen resolution. The Logical Font API is part of the Utilities API under the UI Framework in the SDK help. The term Logical Font API does therefore not appear in the SDK help.

4. Bitmaps and Icons

Bitmap graphics do not scale very well for different screen resolutions. Therefore a new C++ API has been introduced for loading old bitmap icons and scalable icons based on Scalable Vector Graphics – Tiny (SVG-T) [SVGT].

A new tool (MifConv.exe) is also available to produce multi-image files (MIFs) — similar to Multi-Bitmap (MBM) — from SVG-T files. A new application information file (AIF) framework has been introduced to support scalable icons.

5. Localization

Due to new resolutions and the change in the orientation mode the space available for text strings in the screen can change during runtime. Therefore a Symbian C++ application can use shorter and longer versions of the same text. However, it is wise to study the usability of each case. Texts in a localization file (.loc) can have alternative versions for different text spaces. When reading this kind of text from resources and passing it to Avkon components, the available space is checked for the text based on the current layout and orientation, and the correct alternative is selected. In addition, a utility function in `AknTextUtils` can be used directly, especially if the text is drawn directly to the screen.

6. Scalable Themes

In the previous S60 releases, themes were based on bitmaps. In S60 2nd Edition, Feature Pack 3, themes are extended to support SVG-T graphics. Themes can contain bitmaps or SVG graphics or a mixture of both.

Series 60 Theme Studio [THEM] will be updated to support new SVG-T graphics.

7. Compatibility

If an application is using standard Avkon UI components, no modifications to the code, or only minor ones, may be needed, since the Avkon components scale automatically. However, recompilation is still needed. If an application implements its own custom controls or draws directly to the screen, modifications are needed to handle different screen resolutions and orientations.

In addition, S60 2nd Edition, Feature Pack 3 has a compatibility mode that enables legacy applications designed for a 176 x 208 resolution to run in terminals using other resolutions. In the compatibility mode there are bars around the screen (240 x 320) or all the pixels are quadrupled (352 x 416).

8. Creating Applications for Scalable UI

In order to implement scalable UI applications, a new C++ SDK is needed. The new SDK will support new APIs and tool chains. An enhanced emulator will support switching of the resolutions.

9. Scalable UI in Java™ Applications

In Java™ applications, high-level UI components scale automatically. However, developers must take care of scaling `Canvas` and `CustomItem`. If MIDlets are setting the

preferred sizes for `Form` items, they may also need to be scaled with resolution changes. Scalable icons are not available in the Java platform, therefore a set of bitmaps are needed for each of the resolutions. In the future JSR 226: Scalable 2D Graphics API for the Java™ 2 Platform, Micro Edition (J2ME™) [JAVA] provides support for SVG. Device implementation gives notification (calls `Displayable.sizeChanged` method) when the drawable area changes.

10. Terms and Abbreviations

Term or abbreviation	Meaning
AIF	Application information file. Specifies an application icon and caption.
Avkon	S60 UI library.
Bitmap	Bitmap graphics are pixel-by-pixel representations of an image. For each pixel, there are a number of bits that define the color of the pixel. Common bitmap file types include BMP, JPEG, and PNG.
QVGA	Quarter VGA. QVGA is a common size for high-resolution phone displays. VGA is 640 x 480 pixels and QVGA is one-quarter of the area.
MBM	Multi-Bitmap file. A file format for storing bitmap images.
MIF	Multi-image file. Similar to an MBM file, but used for scalable icons instead of bitmaps.
SDK	Software development kit.
SVG	Scalable Vector Graphics. A language for describing two-dimensional graphics and graphical applications in XML.
SVG-T	SVG Tiny. A Mobile SVG Profile containing a subset of SVG modules.

11. References

- [JAVA] Java Specifications, Sun Microsystems Inc.
<http://java.sun.com/>
- [SVGT] Mobile SVG Profiles: SVG Tiny and SVG Basic, W3C SVG Working Group
<http://www.w3.org/TR/SVGMobile/>
- [THEM] Series 60 Theme Studio (for Symbian OS), Forum Nokia
<http://www.forum.nokia.com/tools>

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