

Series 40 Platform: FAQ

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Series 40

NOKIA

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Change history

October 29, 2003	Version 1.0	Initial document release
June 28, 2004	Version 1.1	Updated information on tools and platform architecture
June 13, 2005	Version 2.0	Updated with information on Series 40 3rd Edition
May 1, 2006	Version 2.1	Updated with information on Series 40 3rd Edition, Feature Pack 1
April 16, 2007	Version 2.2	Updated with information on Series 40 3rd Edition, Feature Pack 2 in Chapters 2 and 3
May 7, 2007	Version 3.0	Revised and updated with information on Series 40 5th Edition
November 16, 2007	Version 3.1	Revised and updated with information on Series 40 5th Edition, Feature Pack 1 and updated details on SDK availability and Java™ IDE support in Chapter 4
June 26, 2008	Version 3.2	Updated throughout to provide information on the features of Series 40 6th Edition

1 What is the Series 40 platform?

1.1 What is the Series 40 platform?

The Series 40 platform delivers the biggest opportunity for developers and an advanced mobile experience for the mass market. It includes a set of technologies designed to enable the building of devices that can run Java™ MIDP applications and offer rich media and content options.

In taking a platform approach, Nokia recognizes that developers need a consistent set of technologies to take advantage of the opportunities presented by the wireless marketplace. The platform approach delivers uniform technologies across the widest possible range of Nokia devices, which themselves provide a variety of capabilities, user interfaces, and form factors to optimally address the demands of all customers. Series 40 6th Edition represents the continuation of this commitment, with support for the subset of the Mobile Service Architecture (JSR-248). JSR-248 not only delivers to developers consistent APIs across Nokia platforms, but it also will eventually provide common APIs across a broad range of other manufacturers' Java phones.

1.2 What do the different “editions” of the Series 40 platform represent?

The Series 40 platform is continually developing and adding new features. A new edition of the Series 40 platform represents a collection of significant feature updates and additions to the platform, often accompanied by significant changes in the Java™ technology supported by the platform.

1.3 What are feature packs?

Feature packs are important releases of additional features that become available between releases of new editions. The first edition to have a feature pack release is the 3rd Edition. Series 40 3rd Edition, Feature Pack 1 adds significant new Java™ technology features and support for Flash Lite from Adobe. The ongoing release of feature packs allows the Series 40 platform to develop, while maintaining a common baseline across the editions.

1.4 Which technologies does the Series 40 platform contain?

The Series 40 platform provides a common set of technologies and APIs for application development and digital content distribution. The platform includes a set of Java™ APIs, a Flash Lite Player from Adobe, a browsing environment, multimedia messaging service (MMS), theme capability, and support for audio and video content, both downloadable and streaming.

1.5 Which devices incorporate the Series 40 platform?

A wide range of devices incorporating the Series 40 platform are available for all the major wireless standards, including GSM, CDMA, EDGE, and wideband CDMA (WCDMA)/Universal Mobile Telecommunications System (UMTS). Information about available devices can be found on the Forum Nokia Web site by following the links from the Series 40 platform section (<http://www.forum.nokia.com/series40>) or from the Device Specifications area (<http://www.forum.nokia.com/devices>).

1.6 Which user interfaces are implemented on devices incorporating the Series 40 platform?

Devices based on the Series 40 platform implement a common user-interface style, which defines the behavior of UI components, ensuring a consistent user experience. At the same time, the screen resolution, orientation, and input methods can vary among certain Series 40 devices. Since the

introduction of Series 40 3rd Edition, Feature Pack 2, devices have implemented the platform's UI using a color display of either 240 x 320 pixels or 128 x 160 pixels in combination with an International Telecommunication Union (ITU) keyboard, a five-way navigation pad, and three labeled softkeys.

1.7 Which network standards does the Series 40 platform support?

The Series 40 platform is designed to be used in devices supporting many types of 2G, 2.5G, and 3G mobile-phone networks, including:

- GSM and general packet radio service (GPRS).
- CDMA.
- EDGE.
- Universal Mobile Telecommunications System (UMTS).

In addition, Series 40 devices may offer local network-connectivity options, including Bluetooth wireless technology, Universal Serial Bus (USB), IrDA, and WLAN using Unlicensed Mobile Access (UMA) technology.

1.8 What kinds of end users does the Series 40 platform target?

Nokia is committed to providing a diverse range of devices to serve a full range of consumer tastes and applications. For example, some Series 40 devices may offer features such as advanced digital-music capabilities, while others may be targeted at specific fashion segments.

2 What's new in Series 40 6th Edition?

2.1 What new Java™ technology does Series 40 6th Edition support?

Series 40 6th Edition adds support for the following new features and new or enhanced Java™ APIs:

- Location API for J2ME™ (JSR-179), which enables the creation of location-based applications. These applications can utilize an external Bluetooth GPS unit to obtain location information.
- Wireless Messaging API 2.0 (JSR-205) with the inclusion of support for cell broadcast service (CBS) message handling.

2.2 What other new development technologies are supported in Series 40 6th Edition?

Series 40 6th Edition adds support for Flash Lite 3 Player from Adobe.

2.3 How does Series 40 6th Edition protect my investment in applications and services?

Series 40 6th Edition is an evolutionary development of the Series 40 platform. The technologies are generally backward-compatible with previous editions and feature packs of the Series 40 platform as follows:

- *Java™ technology* — The Nokia UI API has been retained to allow existing Series 40 1st Edition MIDlets to function on Series 40 6th Edition devices.
- *Browsing* — Browsing is offered for HTML, XHTML Mobile Profile (XHTML-MP), and WML 2.0, so existing WML content is viewable on Series 40 6th Edition devices.
- *Messaging* — Multimedia messaging service (MMS) content without Synchronized Multimedia Integration Language (SMIL) will be rendered as it was in Series 40 1st Edition.

- *Audio and video content* — Standards from Series 40 5th Edition, Series 40 3rd Edition, Series 40 2nd Edition, and Series 40 1st Edition have been retained so existing content can still be viewed or heard.
- *Themes* — New theme content for Series 40 3rd Edition phones is ignored by earlier phones.

2.4 Which devices use Series 40 6th Edition?

The first device to use Series 40 6th Edition is the Nokia 7510 Supernova phone. To find out which devices use the various editions and feature packs of the Series 40 platform, visit the Forum Nokia Web site's Series 40 platform section (<http://www.forum.nokia.com/series40>) or Device Specifications area (<http://www.forum.nokia.com/devices>).

2.5 What is Nokia's roadmap for devices that support Series 40 6th Edition?

Nokia will be progressively releasing new devices that support Series 40 6th Edition. It is expected that a large number of Series 40 5th Edition, Series 40 3rd Edition, Series 40 2nd Edition, and Series 40 1st Edition devices will remain in use for the next few years.

3 Which technologies does the Series 40 platform contain?

3.1 Which development technologies are available?

The Series 40 platform offers two development options for creating applications that can be installed on a device:

- Java™ Platform, Micro Edition (Java™ ME) technology, connected limited device configuration (CLDC) 1.1, and mobile information device profile (MIDP) 2.0 or 2.1.
- From Series 40 3rd Edition, Feature Pack 1 onward, Adobe Flash Lite.

In addition, Web-based applications can be created using:

- HTML 4.01, CSS2, JavaScript 1.5, and Ajax.
- XHTML Mobile Profile (XHTML-MP) 1.1 with ECMAScript Mobile Profile support for XHTML-MP 1.1 tags.
- WML 2.0 with support for WMLScript.

Coding directly to the operating system is not supported.

3.2 How are applications and content downloaded to and installed on Series 40 devices?

Applications and content can be downloaded over the air (OTA) and installed directly on a Series 40 device. The ability to perform OTA application downloads depends on local operator support. Applications and content can also be downloaded from the Internet to a PC and installed on a Series 40 device using the Nokia PC Suite via a Universal Serial Bus (USB) cable, a Bluetooth connection, or an IrDA connection.

3.3 Is support for WAP Push provided?

The Series 40 platform includes support for the WAP Push Access Protocol (PAP), allowing developers to link messages and applications. This provides greater control of content delivery and handling, with capabilities such as application confirmation of messages and server querying for device capabilities.

3.4 What DRM support does the Series 40 platform provide?

The Series 40 platform supports Open Mobile Alliance (OMA) digital rights management (DRM) version 1.0. The DRM standard is designed to allow content providers to define the usage rights for digital media objects and thereby control the consumption of media. OMA forward-lock, combined delivery, and separate delivery methods of content protection are supported.

From Series 40 3rd Edition, Feature Pack 1 onward, support is also provided for OMA DRM version 2.0. This standard extends the DRM version 1.0 separate delivery mechanism by tying rights information to a device using a Public Key Infrastructure (PKI) certificate. This mechanism provides a higher level of protection to digital media.

3.5 What mechanisms does the Series 40 platform support for configuring device settings?

The Series 40 platform supports three technologies that enable the configuration of device settings. These are:

- Open Mobile Alliance (OMA) Client Provisioning (CP) — This is a mechanism that allows settings to be sent to a device as an XML-format short message service (SMS) message. These messages can be sent to the device or delivered on a subscriber identity module (SIM) card.
- OMA Device Management (DM) — This is a mechanism that allows settings to be maintained on a device over an HTTP connection. Setting updates can be initiated both by a defined server or the device user. OMA DM also provides a mechanism to initiate OMA firmware over-the-air (FOTA) updates on a Series 40 device.
- Plug and Play Mobile Services (PnP-MS) — This mechanism opens the device browser at a page from which the user can request OMA CP configuration details.

3.6 Which synchronization technologies does the Series 40 platform support?

From Series 40 3rd Edition onward, the Series 40 platform supports Open Mobile Alliance Data Synchronization (OMA DS) version 1.1.2, which provides a set of universal protocols for data synchronization. In addition, the ability to initiate synchronization over the air (OTA) from server-based alerts has been added.

3.7 Which audio and video standards does the Series 40 platform support?

In addition to audio files in MIDI and True Tones formats, from Series 40 3rd Edition onward, the Series 40 platform supports streaming audio in the Adaptive Multi-Rate Wideband (AMR-WB) and Advanced Audio Coding (AAC) formats.

The Series 40 platform supports video in H.263 and MPEG-4 formats. From Series 40 3rd Edition onward, the Series 40 platform supports streaming video in H.263 format. From Series 40 6th Edition onward, the Series 40 platform also supports the format Windows Media Video (WMV), which conforms to the Society of Motion Picture and Television Engineers (SMPTE) 421M (also known as VC-1) standard.

3.8 Which editions support Flash Lite content?

Series 40 3rd Edition, Feature Pack 1 added support for Flash Lite 1.1 from Adobe. Flash Lite 2.0 support was added to Series 40 3rd Edition, Feature Pack 2, Flash Lite 2.1 is supported in Series 40 5th Edition, and Flash Lite 3 is added in Series 40 6th Edition.

3.9 Java™ application development

3.9.1 Which versions of Java™ MIDP and JSRs does the Series 40 platform support?

Series 40 1st Edition supports Java™ Platform, Micro Edition (Java™ ME), connected limited device configuration (CLDC) 1.0, and mobile information device profile (MIDP) 1.0 technologies. In addition, the Nokia UI API, containing a UI enhancement API, gives developers more capabilities in the areas of graphics, full-screen drawing, access to softkeys, and sound and vibration features. Some platform-compliant Series 40 devices also support the Wireless Messaging API (JSR-120).

Series 40 2nd Edition is compliant with Java™ Technology for the Wireless Industry (JSR-185) and supports CLDC 1.1 and MIDP 2.0. To ensure backward compatibility, Nokia also provides the Nokia UI API extension, though the capabilities that these APIs support are now part of MIDP 2.0.

Series 40 2nd Edition adds support for three more APIs.

- Java™ APIs for Bluetooth (JSR-82), which allow applications to exploit Bluetooth connectivity. Standard Bluetooth protocol RFCOMM is supported, as is Service Discovery. It should be noted that the implementation does not support OBEX.
- Wireless Messaging API (JSR-120), which gives application developers device-independent access to short message service (SMS).
- Mobile Media API (JSR-135), which provides developers with APIs to access MIDI and tone sound for playback on Series 40 devices.

In addition, PDA Optional Packages for the J2ME™ Platform (JSR-75) and Mobile 3D Graphics API (JSR-184) are supported in selected devices, such as the Nokia 6230i imaging phone.

Series 40 3rd Edition retains JSR-185 compliance, builds on the CLDC 1.1 and MIDP 2.0 support, and builds on Series 40 2nd Edition features with:

- An enhanced Mobile Media API (JSR-135) implementation, with support for sampled audio playback as well as image and video rendering.
- PDA Optional Packages for the J2ME™ Platform (JSR-75), including both Personal Information Management (PIM) and FileConnection (FC), which allows applications to access calendar, contact, and to-do records, as well as the file system to perform tasks such as saving e-mail attachments in a Java e-mail application.
- Mobile 3D Graphics API for J2ME™ (JSR-184), which provides features to create rich 3D graphics for games, animated messages, custom user interfaces, and interactive product visualization.

In addition, the Scalable 2D Vector Graphics API for J2ME™ (JSR-226) became available on Series 40 3rd Edition devices starting with the Nokia 6280 wideband CDMA (WCDMA)/EDGE imaging phone.

Series 40 3rd Edition, Feature Pack 1 adds to Series 40 3rd Edition with support for the following additional Java Specification Requests (JSRs):

- Wireless Messaging API (JSR-205), which supports the sending and receiving of SMS and multimedia messaging service (MMS) messages via GSM and CDMA.
- Scalable 2D Vector Graphics API for J2ME™ (JSR-226), which enables the rendering of scalable 2D vector images, including external images in the Scalable Vector Graphics (SVG) format. The principal uses for this API are in map visualization, scalable icons, and applications that require scalable and rich animated graphics.
- J2ME™ Web Services Specification (JSR-172), which enables applications to parse XML files (with support for Simple API for XML [SAX] 2.0, XML namespaces, UTF-8 and UTF-16 character encoding, and document type definition [DTD] validation).

Series 40 3rd Edition, Feature Pack 2 adds to Series 40 3rd Edition with support for the Application Protocol Data Unit (APDU) package of Security and Trust Services API for J2ME™ (JSR-177).

Series 40 5th Edition adds support for Mobile Information Device Profile 2.1 (JSR-118) and the subset of the Mobile Service Architecture (JSR-248). JSR-248 is designed to reduce Java fragmentation by defining a consistent set of Java technologies for high-volume mobile devices. The subset encompasses JSR-75, JSR-82, JSR-118, JSR-135, JSR-184, JSR-205, and JSR-226.

In addition, Series 40 5th Edition provides the following new or updated Java APIs:

- Java™ APIs for Bluetooth v1.1 maintenance release (JSR-82), with the addition of support for the OBEX protocol.
- J2ME™ Web Services Specification (JSR-172), which now implements the Java™ API for XML-Based Remote Procedure Call (JAX-RPC) subset, which allows applications to use SOAP to access public and private Web services.
- Security and Trust Services API for J2ME™ (JSR-177), which now includes the SATSA-CRYPTO optional package, allowing applications to offer cryptographic features.
- Advanced Multimedia Supplements (JSR-234), providing 3D audio and music support that allows applications to provide a rich sound experience for games and multimedia applications.

Series 40 5th Edition, Feature Pack 1 adds the following new features and new or enhanced Java APIs:

- PDA Optional Packages for the J2ME™ Platform (JSR-75), which now includes support for the video_URL contact field.
- Mobile Media API (JSR-135), which can now handle video progressive playback and audio progressive upload as well as audio mixing.
- Content Handler API (JSR-211), which allows MIDlets to be specified as the content handlers for one or more specific file types, thereby enabling Java applications to handle multimedia and Web content seamlessly.
- Advanced Multimedia Supplements (JSR-234), which can now handle audio mixing, including mixing of 3D audio.

Series 40 6th Edition adds the following new features and new or enhanced Java APIs:

- Location API for J2ME™ (JSR-179), which enables the creation of location-based applications. These applications can utilize an external Bluetooth GPS unit to obtain location information.
- Wireless Messaging API 2.0 (JSR-205) with the inclusion of support for cell broadcast service (CBS) message handling.

3.9.2 Does Nokia plan to support any additional JSRs in the Series 40 platform?

Nokia is committed to providing developers with the most advanced Java™ technology. As a result, some Series 40 devices may be shipped with additional Java Specification Requests (JSRs) not supported in a particular edition or feature pack. For example, the Contactless Communication API (JSR-257), which enables the use of Near Field Communication (NFC) and allows developers to create applications with “smart card” behavior, is implemented on the Nokia 6131 NFC.

It is possible that future Series 40 devices will incorporate additional APIs, either as fully compliant JSR implementations or based on draft JSR recommendations.

3.9.3 Can on-device debugging be undertaken for Series 40 Java™ applications?

On-device debugging can be performed on a target device using `System.out.println(...)` then connecting the device via a DKU-x cable, running HyperTerminal, and connecting to the correct COM port.

3.10 Content development

3.10.1 Which browsing standards does the Series 40 platform support?

Series 40 1st Edition supports WML browsing over WAP. Some Series 40 devices also support XHTML Mobile Profile (XHTML-MP) browsing over WAP or wireless profiled TCP/IP (wTCP/IP).

Series 40 2nd Edition supports XHTML-MP and WML browsing over wTCP/IP in a dual-mode browser.

Series 40 3rd Edition and Series 40 5th Edition support Open Mobile Alliance (OMA) Browsing version 2.1 with WML 2.0-, XHTML- and HTML-based browsing over wTCP/IP.

Series 40 6th Edition adds support for full HTML browsing, with support for HTML 4.01, CSS2, JavaScript™ 1.5, and Ajax.

3.10.2 Which messaging standards does the Series 40 platform support?

Series 40 1st Edition supports multimedia messaging service (MMS), Smart Messaging, and short message service (SMS). Some Series 40 devices may also have e-mail capabilities as a technology extension of the platform.

Series 40 2nd Edition adds support for Synchronized Multimedia Integration Language (SMIL) 2.0 Basic Language Profile in MMS. SMIL is a markup feature that defines the layout, order, and display timing of the multimedia elements in an MMS message, allowing messages to be played as a slide show.

Messaging in Series 40 3rd Edition and Series 40 5th Edition complies with Open Mobile Alliance (OMA) MMS version 1.2. True interoperability is now provided among the content classes: image basic, image rich, video basic, and video rich. Synthetic audio and video can now be included in messages, as well as a maximum supported message size of 300 kB.

Series 40 6th Edition adds support for OMA MMS version 1.3, with a maximum supported message size of 600 kB.

3.10.3 Which version of the Flash Lite Player does the Series 40 platform support?

A Flash Lite Player from Adobe has been provided since Series 40 3rd Edition, Feature Pack 1. The following versions of the Flash Lite player are supported:

- Series 40 6th Edition — Flash Lite 3 Player.
- Series 40 5th Edition — Flash Lite 2.1 Player, with the Flash Lite 3 Player available on selected Series 40 5th Edition, Feature Pack 1 devices.
- Series 40 3rd Edition, Feature Pack 2 — Flash Lite 2.0 Player.
- Series 40 3rd Edition, Feature Pack 1 — Flash Lite 1.1 Player.

3.10.4 What type of content can be created for Adobe Flash Lite?

The implementation of Adobe Flash Lite in Series 40 enables the creation of stand-alone Flash Lite content and applications. It is also possible to create animated screen savers and, for Series 40 5th Edition or later devices, Flash Lite can also be used to create animated “organic” wallpaper.

3.10.5 What other types of content can be developed for Series 40 devices?

Other content possibilities include MIDI ring tones, True Tones, streaming and static audio, streaming and static video, and themes.

4 How do I develop for the Series 40 platform?

4.1 What Java™ development tools are available for the Series 40 platform?

Developer tools for the Series 40 platform include the Series 40 platform SDKs, which are available from the Tools and SDKs section of the Forum Nokia Web site (<http://www.forum.nokia.com/tools>). SDKs are available for all editions and feature packs of the Series 40 platform, except for the Series 40 6th Edition SDK, which is expected to be released during 2008.

The SDKs include a device emulator, Java™ class libraries, APIs (including the Nokia UI API), and documentation. The SDKs support development using the leading integrated development environments (IDEs), NetBeans and Eclipse.

Developers choosing NetBeans are able to take full advantage of the features of NetBeans Mobility. NetBeans Mobility provides developers with a rich development environment offering visual application-flow specification and drag-and-drop creation of the application UI. In addition, NetBeans Mobility offers tools to support the use of Scalable Vector Graphics Tiny (SVGT) in creating graphically rich UIs without the overhead of low-level graphics coding. For more details, see the Tools and SDKs section of the Forum Nokia Web site (<http://www.forum.nokia.com/tools>).

For developers familiar with the Eclipse IDE, installing EclipseME provides a set of tools for creating, testing, and packaging MIDlets for Nokia devices. For more details, see the Tools and SDKs section of the Forum Nokia Web site (<http://www.forum.nokia.com/tools>).

4.2 What tools are available for Web and messaging content developers?

Because the Series 40 platform supports standard Web technologies, Web developers can use the Web development tool of their choice to create content for the Web browsers on the Series 40 platform. Many of these tools also support the creation of multimedia messaging service (MMS) content.

4.3 What tools are available to Flash developers?

Flash CS3 Professional from Adobe Systems Incorporated is available for the development of Flash Lite content and applications. In addition, it is recommended that developers make use of [Adobe Device Central CS3](#), which provides a searchable library of device profiles that enables developers to quickly determine the features supported on various Series 40 devices.

4.4 What tools are available for theme developers?

Carbide.ui Theme Edition is available for the creation of Series 40 themes. Offering full WYSIWYG editions of Series 40 themes, Carbide.ui integrates with the most popular vector-, bitmap-, and audio-editing software. This allows artists and graphic designers to easily create comprehensive themes that

consumers will find visually rich and engaging. Workflow tools and a library function allow existing theme elements to be imported easily into a project, either individually or as a batch. Once a theme is complete, settings for packaging and digital rights management (DRM) protection are required once, after which packaging, protection, and transfer of the theme to a device is a single step. For more details, see the Tools and SDKs section of the Forum Nokia Web site (<http://www.forum.nokia.com/tools>).

4.5 What tools are available for other content development?

For multimedia projects, there is the Nokia Audio Suite, a set of tools for creating SP-MIDI polyphonic ring tones.

Developers who want to generate Open Mobile Alliance (OMA) digital rights management (DRM) and over-the-air (OTA) download files will need to use Nokia Mobile Internet Toolkit (NMIT) 4.1 or later.

4.6 Are all of Nokia's tools available to all developers?

Nokia offers developers the opportunity to join Forum Nokia PRO. One of the benefits of the Forum Nokia PRO program is that members get early access to new and updated tools. Once the early-access period on Forum Nokia PRO has expired, each tool is made available in the Tools and SDKs section of the Forum Nokia Web site (<http://www.forum.nokia.com/tools>).

5 Can I write applications and content that will run on different versions of the platform or on other manufacturers' phones?

5.1 Java™ application development

5.1.1 Will a Java™ application run unchanged on all devices incorporating the Series 40 platform?

Two main criteria affect whether an application for one Series 40 device will run on another: screen resolution and Java™ API availability.

An application that uses mobile information device profile (MIDP) 1.0 and the Nokia UI API should work on any Series 40 device that has the same screen resolution as that of the original target device.

Applications may require modifications to run usefully on Series 40 devices that have screen resolutions that differ from the device resolution of the original target. In addition, if an application makes use of any of the technology extensions provided in a particular Series 40 platform edition or device, its compatibility will be limited to devices of the same edition or with the same technology extensions. Specific Series 40 devices may have unique capabilities, features, or issues. The best way to maximize development investment is to design initially for the Series 40 platform edition that provides the required APIs, and then optimize the design for later editions and feature packs or specific devices.

Some incompatibilities may exist between two Series 40 devices that have the same screen resolution. When incompatibilities are discovered, Nokia will take steps to resolve the issues and will communicate the issues to the developer community through the Forum Nokia Knowledge Base, which is housed in the Forum Nokia Developer Wiki (<http://wiki.forum.nokia.com/index.php/KnowledgeBase>).

5.1.2 Will a Java™ application written for Series 40 6th Edition run unchanged on devices that use an earlier edition?

Developers will need to consider, at an early stage of development, to what extent they want an application to be compatible across devices that incorporate the Series 40 platform. By avoiding specific Java™ Specification Requests (JSRs) and using the APIs provided in the Nokia UI extension rather than those from mobile information device profile (MIDP) 2.0, developers can create applications for devices incorporating any version of the Series 40 platform.

5.1.3 Will Java™ MIDP applications written for the Series 40 platform also run on devices incorporating the S60 platform?

Applications using high-level UI components for the mobile information device profile (MIDP) should run properly on all platforms, so adapting a Series 40 MIDP application to run on S60 devices should require little more than optimizing the UI to the different screen size and key-input arrangement.

Given that both S60 1st Edition and Series 40 1st Edition support MIDP 1.0 with the Nokia UI API extension, applications developed for later editions of the Series 40 platform will require similar optimization to run on either of these platforms.

However, Java™ applications written for the S60 platform may not be adaptable to Series 40 devices, particularly if the applications take advantage of the additional memory or larger screen size employed on S60 devices. Developers who want to target the widest range of devices should always begin development with the most constrained device they plan to support. In addition, developers should test applications in as many emulators and devices as possible to ensure the applications work as expected.

5.1.4 Will applications written for the Series 40 platform run on other manufacturers' phones that use Java™ technology?

Applications developed using the core mobile information device profile (MIDP) 2.0 specification should run on other manufacturers' MIDP 2.0-compliant devices. The same considerations for creating applications that can be used across devices incorporating the Series 40 platform apply with regard to screen size and Java™ Specification Request (JSR) extensions. The use of the legacy Nokia UI API would preclude applications from running unchanged on some other manufacturers' phones.

With the introduction of Series 40 5th Edition, Java applications written using APIs from the subset of the Mobile Service Architecture (JSR-248) should run unchanged on other manufacturers' devices that support JSR-248.

5.2 Content development

5.2.1 How will browser applications be affected by Series 40 6th Edition?

Series 40 6th Edition introduces a new browser based on the WebKit open source components WebCore and JavaScriptCore. This new browser provides support for HTML 4.01, CSS2, JavaScript™ 1.5 and Ajax to offer a desktop browsing-style experience. This browser retains the support for XHTML Mobile Profile (XHTML-MP) and WML.

To address all Series 40 devices, developers should create content in WML. If content is required to be accessible only from Series 40 2nd Edition or Series 40 3rd Edition devices, then it can be created using XHTML-MP. If developers wish to target content at only Series 40 3rd Edition or later devices, content can be developed using a subset of HTML 4.01.

5.2.2 Are MMS content and applications usable on all Series 40 devices?

The Series 40 platform supports multimedia messaging service (MMS) as follows:

- Series 40 1st Edition supports MMS but does not support Synchronized Multimedia Integration Language (SMIL).
- Series 40 2nd Edition supports MMS with SMIL.
- Series 40 3rd Edition and Series 40 5th Edition support Open Mobile Alliance (OMA) MMS version 1.2. This provides true interoperability between the content classes: image basic, image rich, video basic, and video rich. Synthetic audio and video can now be included in messages, and the maximum supported message size has been increased to 300 kB.
- Series 40 6th Edition adds support for OMA MMS version 1.3, with a maximum supported message size of 600 kB.

Therefore, developers need to consider issues such as content type and size when determining which devices their MMS content and applications will work on. In addition, messages designed to work on Series 40 1st Edition need to be created with the components arranged in the required order of presentation to compensate for the lack of SMIL.

To ensure an optimal user experience, developers will also need to consider the screen sizes employed on various Series 40 devices when developing MMS content.

MMS content should work with other manufacturers' MMS phones.

5.2.3 Will themes created for Series 40 devices be usable on other phones?

No. Series 40 themes can only be installed on Series 40 devices. However, Carbide.ui Theme Edition for Symbian OS enables the editing of both Series 40 and S60 themes. Much of the content used in a Series 40 theme can be used to create an S60 theme using the tools in Carbide.ui.

5.2.4 Will other content be usable on all versions of the Series 40 platform?

Where a device incorporating the platform supports a specific file format, content should be usable without alteration. Yet developers may want to address issues such as screen size and available memory to ensure the user receives the best performance possible. Some operators use tools to perform content optimization for media components, such as audio or images, included in a multimedia messaging service (MMS) message. Developers should consult with service providers to determine whether such features are available on targeted networks.

6 Known issues

6.1 How similar will the implementation of core technology be across all the Nokia platforms?

Nokia is committed to maintaining compatibility among the various platforms wherever possible. Where compatibility is not possible, Nokia intends to document the minor differences in API implementations.

6.2 How do I find out about known issues?

Where issues are identified, information will be made available through the Forum Nokia Knowledge Base, which is housed in the Forum Nokia Developer Wiki (<http://wiki.forum.nokia.com/index.php/KnowledgeBase>).

7 What is the business case for developing for the Series 40 platform?

7.1 What is the business case for creating mobile applications and content for the Series 40 platform?

Of the more than 540-million Nokia platform devices shipped by the end of 2006, the majority were based on the Series 40 platform. This offers developers access to markets for content and applications in which the number of potential customers can be measured in the tens of millions.

The users of Series 40 devices are significant consumers of applications and content. In addition, the platform approach offers significant advantages in enabling applications and content for a range of devices based on the Series 40 platform. For example, Kiloo ApS, a Danish company founded in 2000, has found that migrating applications from one Nokia platform and related device to another can be achieved in less than half the time needed for competing platforms. The common technology base of the Series 40 platform, the S60 platform, and the Series 80 platform means applications and content can easily be migrated. This ease of migration allows developers to multiply the potential market for their applications or content with only small incremental investments in optimizing or migrating those offerings.

As of August 2007, 174 different Nokia platform devices have been shipped, most of them based on the Series 40 platform. Within that broad range are devices optimized for music consumption; devices with full keyboards to facilitate messaging; and those with features such as flashlights and thermometers. There are also imaging devices as well as many devices that provide more traditional mobile-phone features. This model differentiation also offers developers the opportunity to create content and applications for specific user groups while retaining mass-market volumes.

The business case for developing for the Series 40 platform is the volume that can be attained. The case is reinforced by the platform approach, which means that Java™ applications, Web content, multimedia messaging service (MMS), themes, audio, and video content can be created for use across this entire family with minimal optimization effort. The Series 40 platform also provides developers with a springboard for leveraging content, from a volume base, onto Nokia's other platforms.

7.2 What marketing tools are available from Nokia?

Nokia connects mobile application developers to the market in multiple ways.

Nokia Content Discoverer (NCD) is an on-device content portal that makes it easy for mobile consumers to discover, download, and purchase great content and applications. With the ability to integrate with multiple content-delivery systems, NCD helps operators maximize mobile application and content sales.

Nokia also offers developers lucrative opportunities to sell Java Verified™ Program applications through Nokia sales channels: Nokia Software Market and Nokia Catalogs. In addition, some applications may be chosen to be embedded in new Nokia devices.

For full details, please follow the Marketplace link in the Developers section of the Nokia Web site (<http://www.nokia.com/developers>).

7.3 What is Forum Nokia Launchpad?

The Forum Nokia Launchpad program is open to developers who want to work more closely with Nokia. The program includes provisions for access to booth space at Nokia events, pod space at Nokia exhibition areas at industry events, visibility within Nokia via company profiles, and inclusion in an application catalog. For more information, visit the Forum Nokia Launchpad page on the Forum Nokia site (http://www.forum.nokia.com/main/forum_nokia_pro/).

7.4 What is Forum Nokia PRO?

For selected developers, the Forum Nokia PRO program offers enhanced technical support, early access to developer tools and documentation, assistance with marketing, and a host of other benefits. For more information, visit the Forum Nokia PRO site (<https://pro.forum.nokia.com/>).

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