



Symbian OS Version 9.4

Symbian OS is the advanced, open operating system licensed by the world's leading mobile phone manufacturers. It is designed for the specific requirements of advanced 2.5G and 3G mobile phones. Symbian OS combines the power of an integrated applications environment with mobile telephony, bringing advanced data services to the mass market.

Symbian OS supports a wide range of device categories with several user interfaces, including Nokia S60, UIQ and the NTT DoCoMo common software platform for 3G FOMA™ handsets. The commonality of Symbian OS APIs enables development that targets all of these phone platforms and categories.



Kernel & Hardware Services

"World class kernel architecture supporting high end performance on mid-range hardware platforms"

- Multithreaded microkernel with hard real-time capabilities
- Supports latest CPU architectures, including support for single-chip hardware platforms
- Extensive support for peripherals and internal/external memory types
- High-performance file system supporting latest NOR, NAND, SD and MMC memory
- Provides the basis for robust, power-efficient and responsive phones



Telephony

"Proven in over 250 networks world-wide with support for the latest HSPA networks"

- Optimized for mobile phones
- Extensive native support for a wide range of network standards
- Standards not directly supported can be implemented through extensible frameworks
- Support for voice and video telephony



Networking & Communications

"Feature-rich, high performance networking for a connected mobile world"

- Broad support for communications protocols including real-time networking and IP services
- Personal area networking including: IrDA,

Bluetooth 2.0, WLAN, USB 2.0 High Speed and USB On-The-Go

- GPS and A-GPS device and network-based services
- UMA enablers
- Support for multihoming and link layer Quality of Service (QoS) on GPRS and WCDMA networks
- Supports IP convergence



Multimedia & Graphics

"Providing end users with an excellent multimedia and graphics experience leveraging hardware acceleration"

- Rich multimedia capabilities
 - audio and video support for recording, playback and streaming
 - support for cameras with high resolutions and advanced features
- Powerful graphics
 - support for rich GUIs (including transparency, alphablending, animations, OpenGL)
 - enables flexible UIs (support for multiple display sizes and multiple display orientations)
- Audio adaptation, routing and policy
- Supports use of audio, video and graphics hardware acceleration
- FM and digital radio support



Generic OS services

"Secure and customisable OS platform for global use, open to all mobile developers"

- P.I.P.S. Is POSIX on Symbian OS
 - significantly reduces the effort required

to migrate desktop and server components onto Symbian OS

- SQL database
- Platform security provides industry leading protection against malware and viruses:
 - system defence mechanism based on granting and monitoring application capabilities
 - allows applications to have private protected data stores
 - full encryption and certificate management, secure protocols (HTTPS, SSL and TLS) and WIM framework
- Full language / script support
- Rich set of options for developing for Symbian OS:
 - content development options include: C++, C (P.I.P.S.), Java (J2ME) and MIDP 2.0
 - tools are available for building C++ and Java applications

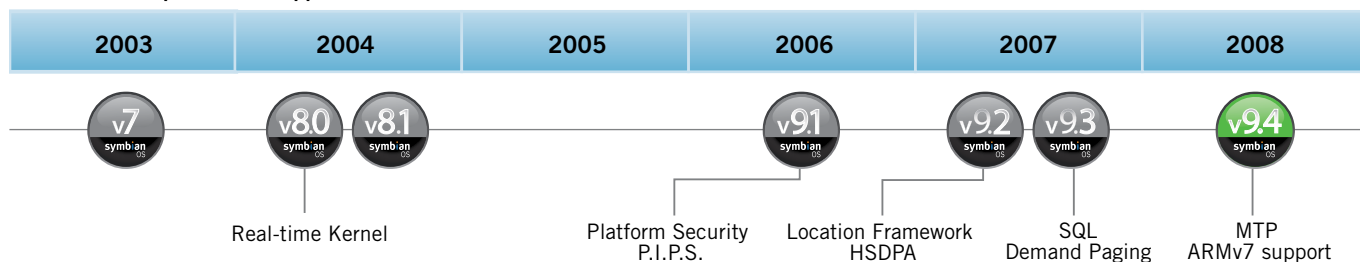


Application Services

"Providing network operators with leading edge services"

- Industry standard messaging capabilities
 - email based on POP3/IMAP4/SMTP including attachment support
 - extensible framework for push email solutions
 - support for SMS and EMS
- Extensive suite of application services
 - includes contacts management, calendaring and bookmarks
 - supports OBEX for exchanging appointments and business cards
- Minimising total cost of ownership through Device Management, OTA provisioning and Firmware Update (FOTA) capabilities

First handset shipment date (approx.)





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Technical Specification

Core OS

Security, Privacy and Content Protection

- Application capability management
- Application data caging
- Cryptographic algorithms – DES, 3DES, RC2, RC4, RC5 and AES
- Cryptographic token framework
- DRM framework and reference implementation
- IPSec and VPN client support plus SSL and TLS

Open Environments

- Standard C environment
- Standard libraries including partial POSIX support (P.I.P.S.)

Location-Based Services

- GPS, A-GPS (terminal-assisted / terminal-based) and network-based positioning
- Mobile originated and mobile terminated requests (including emergency requests)

Telephony

- Multimode Etel (2.5G / 3G)
- GSM Phase 2+
- HSCSD
- GPRS, classes A, B and C (R97/98)
- EDGE (CSD and GPRS)
- WCDMA (3GPP R4 and R5 IMS support)
- HSDPA
- SMS (3GPP TS 23.040 V6.5.0)
- EMS (3GPP TS 23.040 V4.5)
- SIM Application Toolkit
- SIM and USIM support
- Quality-of-Service framework
- Support for multiple primary and secondary PDP contexts
- Third party OTA API

Networking & Comms

- Bluetooth v2.0 (L2CAP, RFCOMM, SDP, GAP and SPP) plus profile support
- Bluetooth stereo headset support
- USB v2.0 High Speed (Mass storage, ACM, WHCM) and USB On-The-Go support
- WLAN
- IrDA & serial
- OBEX over Bluetooth, IrDA and USB
- TCP, IPv4, IPv6, MSCHAP v2, PPP
- TCP/IP plug-in framework
- HTTP plug-in framework
 - HTTP 1.1
 - Pipelining
- WAP push
- Connectionless WSP
- Multihoming, NAPT

Multimedia

- Video capture and playback framework
- Audio capture and playback framework
- Camera interface supporting multi-megapixel cameras and advanced features
- Tuner interface
- Hardware abstraction layer for multimedia acceleration
- Audio and video codec interfaces compliant with OpenMax IL 1.0
- Image conversion (all common formats) with scaling enhancements

Graphics

- Bitmap and vector font support with advanced font effects
- 2D and 3D graphics support including OpenGL ES

Persistent Data Services

- Embedded SQL database

Generic OS Services

- Extensive language support including: Thai, Arabic, Hebrew, Japanese, Chinese, Hindi, Brahmic and Vietnamese scripts
- Unicode 3.0

Kernel & Hardware Services

- ARMv5, v6 and v7 support
- L2 cache support
- Defragmentation of physical RAM
- Demand paging of read-only code and data
- Hardware-dependent support for "VFP" floating point acceleration and accelerated maths functions
- High performance file server
- MMC and SD card support including media >2GB

Generic Middleware

Security Management

- Cryptographic services
- Certificate management (X509 certificates)
- Secure Software Install
- MIDP 2.0 support

Application Protocols

- White/black list URI service for WAP push
- SIP/SDP

Multimedia Middleware

- High-level multimedia service abstraction
- RTP, RTCP

System GUI Frameworks

- Flexible application and UI frameworks
- Control and windowing environments

Application Services / Logic

Remote Management Application Daemons

- Over-the-air firmware upgrade (FOTA)
- OMA Client Provisioning v1.1
- OMA Data Synchronization v1.2
- OMA Device Management v1.2

Enterprise Application Services

- Calendaring including vCalendar v1.0 and interoperability with Microsoft Exchange and Lotus Notes servers
- Contacts management including vCard v2.1
- IMAP4 including IDLE support, RFC2177 and RFC 3501
- POP3 implementation compliant with RFC 1939
- SMTP implementation compliant with RFC 2821
- SMTP Service Extension for Authentication, RFC 2554, Secure SMTP over Transport Layer Security, RFC 3207
- Secure email using TLS with IMAP, POP3, and ACAP, RFC 2595
- Extensible framework for push email solutions

Java

- CLDC HI 1.1.1s (JSR139)
- Bluetooth (JSR082) including OBEX
- Content Handler (JSR211)
- JTWI (JSR185)
- MIDP 2.0 (JSR118)
- Mobile 3D Graphics (JSR184)
- Mobile Media 1.1 (JSR 135)
- PIM & FileGCF (JSR075)
- Wireless Messaging 1.1 (JSR120) including CBS
- Support for JSR248

PC Connectivity

- MTP over USB
- Mobile Active Sync
- Calendar and contacts sync framework

Tools and Documentation

- Eclipse and CodeWarrior-based development environments
- Library of books from Symbian Press
- Developer portal at developer.symbian.com

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