Symbian OS Version 9.1

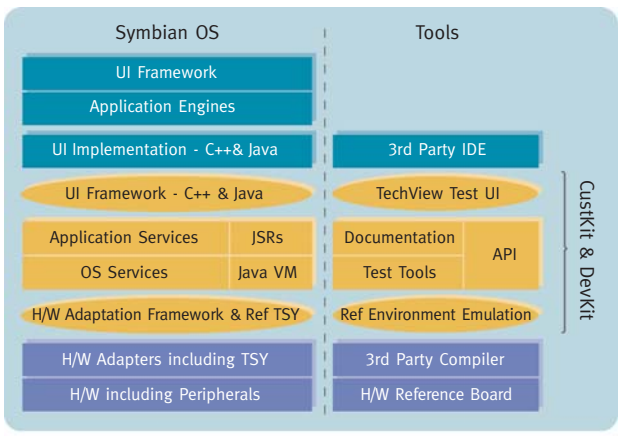
Symbian OS is the advanced, open operating system licensed by the world's leading mobile phone manufacturers. It is designed for the specific requirements of advanced 2G, 2.5G and 3G mobile phones. Symbian OS combines the power of an integrated applications environment with mobile telephony, bringing advanced data services to the mass market.

Symbian OS supports a wide range of device categories with several user interfaces, including Nokia Series 60, UIQ and the NTT DoCoMo common software platform for 3G FOMA™ handsets. Commonality of the Symbian OS APIs enables development targeting all of these phone platforms and categories.

Key features of Symbian OS v9.1:

- **Rich suite of application services** – the suite includes services for contacts, scheduling, and messaging, OBEX for exchanging appointments (vCalendar) and business cards (vCard); integrated APIs for data management, text, clipboard and graphics
- **Java support** – supports the latest wireless Java standards, including MIDP 2.0, CLDC 1.1, JTWI (JSR185), Mobile Media API (JSR135), Java API for Bluetooth (JSR082), Wireless Messaging (JSR120), Mobile 3D Graphics API (JSR184) and Personal Information Management and FileGCF APIs (JSR075)
- **Realtime** – a realtime, multithreaded kernel provides the basis for a robust, power-efficient and responsive phone
- **Hardware support** – supports latest CPU architectures, peripherals and internal and external memory types
- **Messaging** – enhanced messaging (EMS) and SMS; internet mail using POP3, IMAP4, SMTP and MHTML; attachments
- **Multimedia** – audio and video support for recording, playback and streaming; image conversion
- **Graphics** – direct access to screen and keyboard for high performance; graphics accelerator API; increased UI flexibility (support for multiple simultaneous display, multiple display sizes and multiple display orientation)
- **Platform security** – proactive system defence mechanism based on granting and monitoring application capabilities through Symbian Signed certification. Infrastructure to allow applications to have private protected data stores. In addition, full encryption and certificate management, secure protocols (HTTPS, SSL and TLS) and WIM framework
- **Communications protocols** – wide area networking stacks including TCP/IP (dual mode IPv4/v6) and WAP 2.0 (Connectionless WSP and WAP Push), personal area networking support including infrared (IrDA), Bluetooth and USB; support is also provided for multihoming and link layer Quality-of-Service (QoS) on GPRS and UMTS networks
- **International support** – supports the Unicode Standard version 3.0
- **Mobile telephony** – Symbian OS v9.1 is ready for the 3G market with support for WCDMA (3GPP R4 and R5 IMS); GSM circuit switched voice and data (CSD and EDGE CSD) and packet-based data (GPRS and EDGE GPRS); CDMA circuit switched voice, data and packet-based data (IS-95 and 1xRTT); SIM, RUIM, UICC Toolkit; other standards can be implemented by licensees through extensible APIs of the telephony subsystem
- **CDMA specific features including** CDMA network roaming, third party OTA API, NAM programming mode, CDMA SMS stack, NAI handset identification, interfaces to enable Mobile IP and bridge and router gateway modes of operation
- **Data synchronization** – over-the-air (OTA) synchronization support using OMA standards; PC-based synchronization over serial, Bluetooth, infrared and USB; a PC Connectivity framework providing the ability to transfer files and synchronize PIM data
- **Device Management/OTA provisioning** – OMA DM 1.1.2 compliant, OMA Client provisioning v1.1
- **Developing for Symbian OS** – native system and application development in C++, supported by CodeWarrior and (from 2005H2) Eclipse-based IDEs. Java MIDP 2.0 supported by all mainstream Java tools. PC-hosted emulator for general development. Reference boards for general development, 2G, 2.5G and 3G telephony, supported by a range of JTAG probes and OEM debuggers

Symbian OS v9.1 System model



Symbian OS v9.1
Technical specifications

Network services
OMA Data synchronisation v1.1 (Agenda and Contacts)
SMS (3GPP R4) (supported on GSM, WCDMA and CDMA)
Concatenated SMS
EMS (3GPP R4)
Email (POP3, IMAP4, MIME attachments, SMTP, SMTP auth.)
WAP push
Connectionless WSP

Java
CLDC HI 1.1 and MIDP 2.0
JTWI (JSR185)
Java API for Bluetooth 1.0 (JSR082), excluding OBEX
PIM and FileGCF (JSR075)
Wireless Messaging 1.1 (JSR120)
Mobile media 1.1 (JSR 135)
Mobile 3D graphics API for J2ME 1.0 (JSR184)
Personal Information Management API (from JSR075)

Multimedia
Support for multi-megapixel cameras
Audio capture and recording framework
Video capture and recording framework
Direct screen access
Hardware abstraction layer for multimedia acceleration
Abstract camera interface
Still image conversion (all common formats) with scaling enhancements
3D Graphics support with OpenGL ES API and reference implementation (for use with WINS emulator and test h/w only)

Telephony / telephony API
Multimode ETel
GSM Phase 2+
SIM Application Toolkit, class 3
SIM and USIM support
HSCSD
GPRS, classes A, B and C (R97/98)
EDGE (CSD and GPRS)
WCDMA (3GPP R4 and R5 IMS support)
Quality-of-Service framework
Phone book synchronizer
CDMA IS-95 and 1xRTT
R-UIM support
CDMA network roaming support
Third party OTA API
NAM Programming Mode

Application framework
Advanced UI framework
Contacts (incl. vCard)
Agenda (incl. vCalendar)
Unicode v3.0
Now supports Thai, Arabic, Hebrew, Japanese and Chinese

Device management
Smart Messaging
- vCard and vCalendar
- OTA system configuration

OMA Device Management v1.1.2
OMA Client provisioning v1.1

Communication infrastructure
TCP, IPv4, IPv6, MSCHAP v2, RTP
IPSec
TCP/IP plug-in framework
HTTP plug-in framework
- HTTP 1.1
- Pipelining

Multiple Primary and Secondary PDP contexts
Multihoming
Support for PPP and Mobile IP CDMA specifications

Personal Area Networking
Bluetooth stereo headset support
Bluetooth v1.2 (L2CAP, RFCOMM, AFH, SDP, GAP and SPP, eSCO)
Bluetooth PANu and PAN GN
IrDA
USB client v2.0 Full Speed (ACM, WHCM)
USB Mass storage support
Serial
Obex over Bluetooth, IrDA and USB
PC Connectivity
- agenda and contacts sync framework
- file transfer

Security
Application capability management
Application data caging
DRM framework and reference implementation
Cryptographic algorithms – DES, 3DES, RC2, ARC4, RC5 and AES
Certificate management (X509 certificates)
Secure Software Install – MIDP 2.0 support
Cryptographic token framework
SSL/TLS (secure web connections)
IPSec and VPN client support

Software development
J2ME MIDP 2.0
'CodeWarrior for Symbian OS' v3.0 and ARM RVCT 2.2 compiler
PC emulation environment
GCC 3.4
Eclipse-based tools for Symbian OS v9