QNX Neutrino Realtime Operating System

Full-featured operating system offering maximum reliability, unparalleled security, and realtime performance for embedded devices.

Since 1980, manufacturers have relied on QNX® realtime technology to power their mission-critical applications – everything from medical instruments and Internet routers, through in-car infotainment devices and 9-1-1 call centers, to nuclear monitoring systems and military communications. Small or large, simple or distributed, these systems share an unmatched reputation for operating 24 hours a day, 365 days a year, nonstop.

Build self-healing systems

Time-tested and field-proven, the QNX Neutrino® RTOS is built on a true microkernel architecture. Under this system, every driver, application, protocol stack, and filesystem runs outside the kernel in the safety of memory-protected user space. Virtually any component can fail and be automatically restarted without affecting other components or the kernel. No other commercial realtime operating system provides such a high level of fault containment and recovery.

Inherently modular, the QNX Neutrino RTOS lets you dynamically upgrade modules, introduce new features, or deploy bug fixes – without costly downtime or system outages.

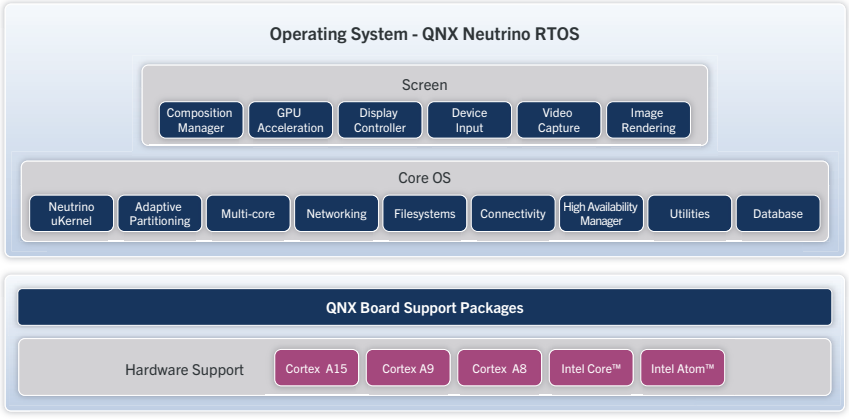
Deliver devices with modern, compelling user interfaces

HMI technologies change fast. If your platform doesn't keep up, you may be stranded with outdated and unsupported software. The QNX Neutrino RTOS has a unique composition manager that enables the creation of a single unified interface from multiple technologies. Its universal application platform has the ability to add new HMI technologies as they become relevant. This allows you to use the most appropriate graphics technology, be it video, OpenGL ES, HTML5 or Qt 5.

Maximize software investments

Engineered to the POSIX standard (1003.1-2003 POSIX.1), the QNX Neutrino RTOS has the power to port legacy and open source UNIX, Linux, and Internet code with just a simple recompile. With standard APIs, you can reuse application code, avoid costly delays, and shorten their learning curve – accelerating development cycles and reducing time to market.

In addition, the QNX Neutrino RTOS provides pre-integrated, out-of-the-box support for a wide range of connectivity technologies, secure and fail-safe filesystems, and a built-in high availability solution.



QNX Neutrino RTOS architecture – The QNX Neutrino RTOS is a full-featured and robust OS that scales down to meet the constrained resource requirements of realtime embedded systems. Its true microkernel design and its modular architecture enable you to create highly optimized and reliable systems with low total cost of ownership.

Build secure, safe and reliable systems

The QNX Neutrino RTOS has innovative security mechanisms designed to help you easily build impenetrable devices. Encrypted filesystems, memory guard pages, and limited *root* permissions are core features of the operating system that can be used to create secure and reliable devices. It has adaptive partitioning to guarantee system resources for your applications during overload conditions and helps you build secure, reliable embedded systems without compromising realtime performance or flexibility.

Choose your hardware

Jump-start development on your selected platform with QNX Neutrino RTOS support for a broad range of ARM Cortex A series and x86 platforms. Simplify driver development for custom hardware, using the QNX Neutrino RTOS resource manager framework, which unlike conventional drivers, runs in memory-protected user space.

Foundry27

This community portal for QNX developers provides software updates, board support packages, drivers, forums, and wikis. Whether developers want to discuss ideas, post questions or answers about developing with QNX, or download drivers for the latest hardware, Foundry27 offers the resources required.

QNX Neutrino RTOS at a glance

Microkernel architecture

- Dynamically upgradable services and applications
- Fine-grained fault isolation and recovery
- Message-passing design for modular, well-formed systems

Instrumented microkernel

- System-wide performance analysis and optimization
- Fast detection of timing conflicts and hidden faults

Multi-core

- Comprehensive multi-core support
- Asymmetric, symmetric, and bound multiprocessing
- Simple migration from uni-processor to multiprocessing

Graphics and HMI technologies

- HTML5, Qt 5, OpenGL ES, video, and other 3rd party HMI technologies
- Single unified interface from multiple UI sources
- Modern architecture that leverages GPU acceleration and supports multi-touch input and video capture

POSIX compliance

- POSIX PSE 52 certified
- Support of the broadest range of POSIX API specifications

Transparent distributed processing

- Transparent network access to remote resources
- Simplified design of fault-tolerant clusters

Networking and connectivity

- Wifi 802.11 a/b/g/n
- Full IPv4 and IPv6 stack support
- USB 3.0, USB Device, and OTG support

Predictable realtime performance

- Pre-emptive scheduler with choice of scheduling methods
- Distributed priority inheritance

Adaptive partitioning

- Guaranteed system resources to build secure, reliable systems without compromising performance and flexibility

File systems

- Image, RAM, Flash, QNX, Linux, DOS, CD-ROM, DVD, NFS, CIFS, Compression, NTFS, and HFS+
- Power safe mass storage file system

Resource manager framework

- Device drivers are implemented in user, not kernel, space
- Drivers can be started, stopped, and debugged like any standard application

High availability

- Heartbeating for early fault detection
- Intelligent restart and transparent reconnection

BSPs

- Hundreds of supported boards at Foundry27

Device drivers

- Audio, character, disk, graphics, input, networking, parallel, printer, serial, and USB

Processor support

- ARM Cortex A series andx86

About QNX Software Systems

QNX Software Systems Limited, a subsidiary of BlackBerry, is a leading vendor of operating systems, development tools, and professional services for connected embedded systems. Global leaders such as Audi, Cisco, General Electric, Lockheed Martin, and Siemens depend on QNX technology for vehicle infotainment units, network routers, medical devices, industrial automation systems, security and defense systems, and other mission- or life-critical applications. Founded in 1980, QNX Software Systems Limited is headquartered in Ottawa, Canada; its products are distributed in more than 100 countries worldwide. **Visit www.qnx.com**