

QNX Neutrino Realtime Operating System

Memory-protected microkernel architecture for maximum reliability, unparalleled scalability and realtime performance for embedded applications

Since 1980, manufacturers have relied on QNX realtime OS (RTOS) technology to power their mission-critical applications — everything from medical instruments and Internet routers to in-car infotainment devices, 9-1-1 call centers, 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 memoryprotected user space. Virtually any component can fail and be automatically restarted without affecting other components or the kernel. No other commercial RTOS provides such a high level of fault containment and recovery.

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

Scale large or small

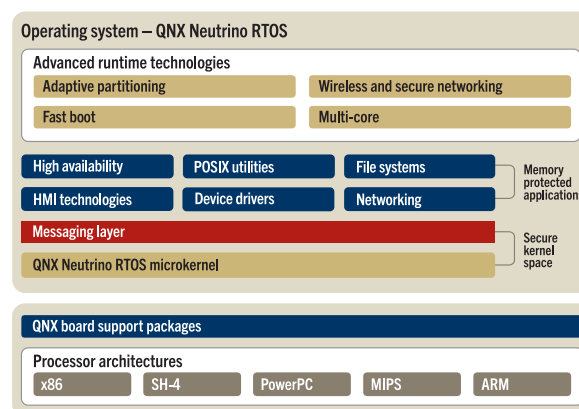
Design systems with a single or multiprocessor architecture, take advantage of the QNX Neutrino RTOS inherent multicore capability and leverage built-in transparent distributed processing to create large, highly fault-tolerant systems. Whatever your design requirements, you can use the same RTOS, tools, APIs, and source code for all your projects. The result? Longer product life cycles, shorter development time, and a significant return on investment.

Maximize software investments

Engineered to the POSIX standard (1003.1-2001 POSIX.1), the QNX Neutrino RTOS gives you 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 your 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 networking protocols, flash file systems, and a built-in high availability solution.

QNX Neutrino RTOS architecture



The QNX Neutrino microkernel memory-protected architecture provides a reliable foundation for systems that can support fault containment and recovery, dynamic upgrades, and massive scalability.

Build secure, safe and reliable systems

Use adaptive partitioning to guarantee system resources for your applications. Build secure, reliable embedded systems without compromising realtime performance and flexibility. To achieve the highest level of performance, adaptive partitioning allows applications to use all available CPU cycles under normal operating conditions. During overload conditions, adaptive partitioning enforces hard resource guarantees, ensuring applications receive their budgeted share of resources.

Choose your hardware

Jump-start development on your selected platform with QNX Neutrino RTOS support for a broad range of x86, PowerPC, ARM, MIPS and SH-4 platforms. Simplify driver development for custom hardware, using the QNX Neutrino resource manager framework, which unlike conventional drivers, runs in memory-protected user space.

Foundry27

This community portal for QNX software developers provides source repositories, forums, blogs and wikis. Whether the developer wants to discuss ideas with fellow developers or even create a new code project for the QNX community, Foundry27 offers the resources required.

About QNX Software Systems

QNX Software Systems, a subsidiary of Research In Motion Limited (RIM), is a leader in middleware, development tools, operating-system software, and professional services for the embedded market. Companies such as Cisco, Daimler, General Electric, Lockheed Martin, and Siemens depend on QNX technology for vehicle telematics units, network routers, industrial control systems, medical instruments, security and defense systems, and other mission- or safety-critical applications. Founded in 1980, QNX Software Systems is headquartered in Ottawa, Canada; its products are distributed in over 100 countries worldwide.



QNX SOFTWARE SYSTEMS

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, hidden faults, etc.

Multi-core

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

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

IP networking

- ▶ Wifi 802.11 a/b/g
- ▶ NetBSD (IPsec, IPv4/IPv6)
- ▶ IP Filtering and NAT, SNMP

Predictable realtime performance

- ▶ Preemptive 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, 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

Device drivers

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

High availability

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

Java

- ▶ Certified Java powered runtime environment
- ▶ Full access to OS services for Java applications

Processor support

- ▶ ARM, PowerPC, SH-4, x86, MIPS
- ▶ Extended memory support (beyond 4G) for x86, MIPS, and PowerPC