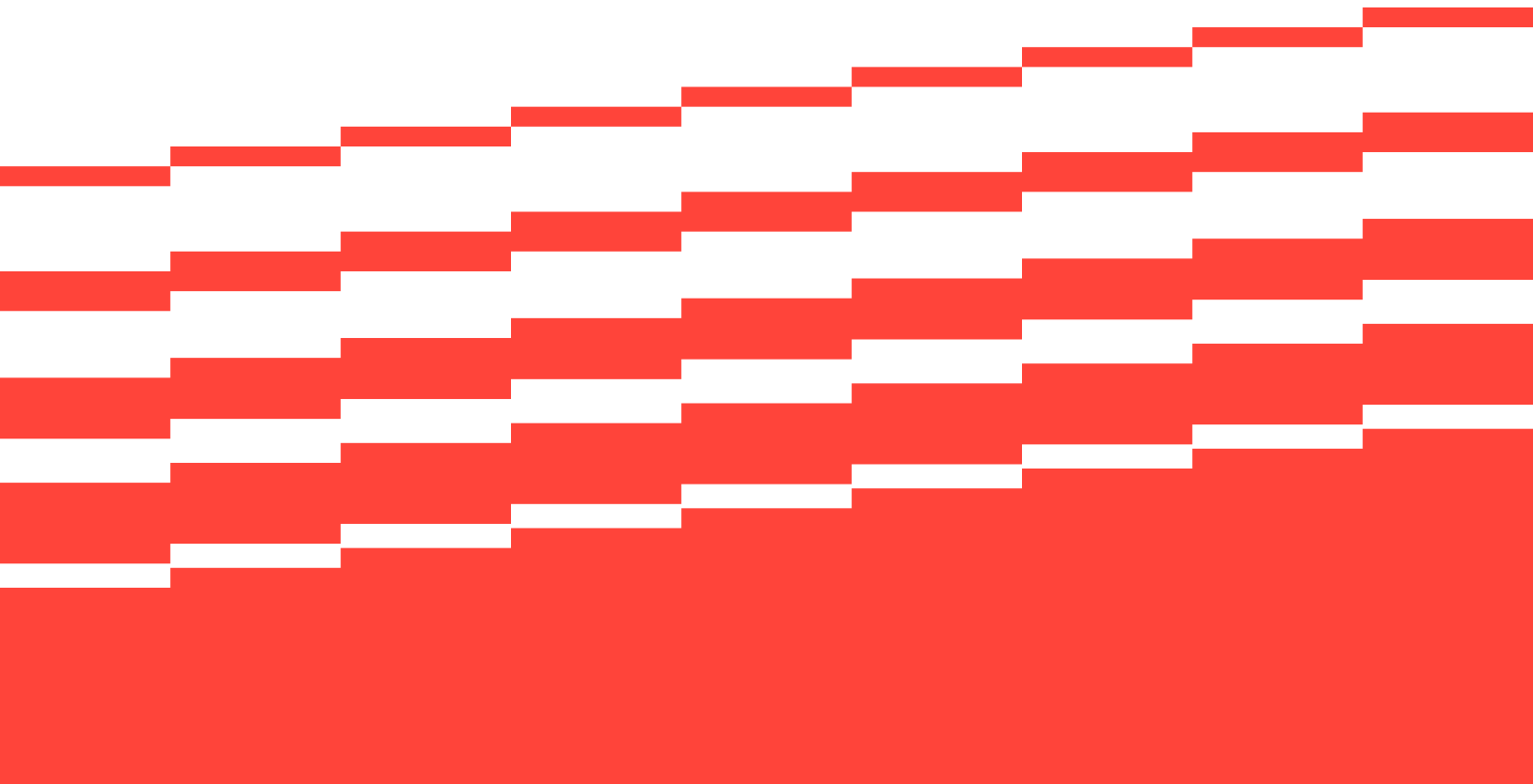
QNX

Product Brief

QNX Software Development Platform 8.0

Unleash the Power of Next-Generation Embedded Computing



Introducing QNX SDP 8.0

QNX® Software Development Platform (SDP) 8.0 forms the foundation for the next generation of high-performance and compute-intensive systems like autonomous driving and industrial robots. It offers game-changing performance, a future-proof design, and seamless scaling with the added benefits of safety and security.

The High-Performance OS and Development Platform for Next-Generation Embedded Systems

QNX SDP 8.0 features our next-generation QNX® operating system built on an advanced microkernel design to maximize silicon advancements. QNX SDP 8.0 streamlines development efforts and enables easy migration from QNX SDP 7, Linux® and other POSIX-based operating systems.

Its unique architecture enables development teams to use a redesigned microkernel to take advantage of advanced hardware and isolates system functions for high reliability and real-time allocation of processing power and other resources. QNX SDP 8.0 incorporates security-and safety-by-design and is compatible with standard tools, libraries, and frameworks.

Product Components

QNX OS 8.0

A real-time operating system with our next- generation microkernel that has been augmented to support the latest Armv8, Armv9 and x86 64 hardware platforms. The QNX OS features a redesigned microkernel built on the pillars of performance, scalability, security, safety, and real-time execution. Performance and real-time execution are central to the design of the QNX OS. It offers real-time determinism when microseconds matter. This means it can handle many time-critical tasks where predictability, scalability, and reliability are necessary for mission- and safety-critical applications. And its modular design makes it more flexible than a traditional monolithic OS. Its scaling capabilities meet the needs of high-performance, compute-intensive system architectures powered by next-generation silicon.

QNX Software Center

A software delivery tool used to manage the discovery, delivery, and dependencies of QNX development products in a centralized fashion. With the QNX® Software Center, QNX developers are proactively alerted when relevant security updates, patches, and new product releases are posted, or about activities related to QNX product licensing.

QNX Tool Suite

QNX Tool Suite offers the trusted QNX Momentics® Integrated Development Environment (IDE), the QNX® Toolkit for Visual Studio Code, and the QNX® Command Line Tools.

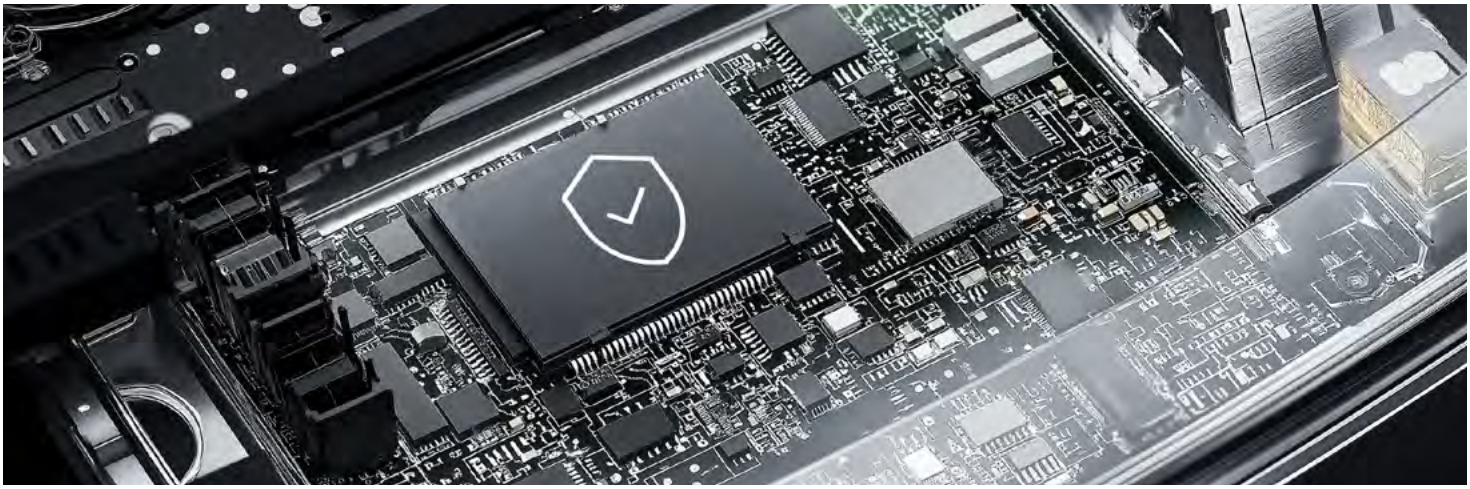
- QNX Momentics is an industry standard IDE that helps you quickly set up your project, choose your programming language, choose a target processor, compile your code, connect to your target, transfer your application to your target, then run, debug, profile, and fine-tune it.
- The QNX Toolkit for Visual Studio Code is an extension available on the VS Code marketplace and provides QNX® System Information and QNX® System Profiler addition to the many code editing features afforded by VS Code.
- The QNX Command Line Tools component is a comprehensive set of development utilities to create and manage executables, object files, libraries, and other operations such as basic system profiling and includes enhanced system profiling and debugging capabilities.

Access QNX OS 8.0 in the Cloud

QNX® Accelerate is an initiative that gives you access to cloud hardware targets that run QNX® technology, including QNX OS 8.0. By harnessing the agility, speed, and scale of the cloud, it empowers developers in new ways—enabling better collaboration, increasing development efficiencies, and reducing time-to-market.

Find out more about QNX Accelerate →

blackberry.qnx.com/en/products/accelerate



Advantages

Microkernel Architecture

The QNX OS 8.0 microkernel architecture isolates in its own address space, outside the kernel.

This means that a failed component won't take down other components or the kernel; it can be restarted immediately with minimal impact on the rest of the system. With a fault-tolerant and secure microkernel architecture, QNX OS 8 is the ideal OS for all future projects with the ability to change the underlying hardware (2-core SOC to 64-core SOC). Its future-ready reliable design works across all safety and non-safety related and deeply embedded to high performance compute systems without needing to change the OS and with limited impact on system-level performance.

High-Performance Compute

QNX OS 8.0 provides high overall OS throughput performance driven by the next-generation microkernel and upgrades to the OS services such as filesystems and networking. This will enable development teams to utilize SOCs ranging from 2 to 64 cores to their full potential.

Seamless Scalability

QNX OS 8.0 provides near-linear scalability as the number of cores increases. This allows development teams to scale and increase the workloads on SOCs with CPU cores ranging from 2 to 64 cores as seamlessly as possible.

Hard Real-Time

QNX OS 8.0 improves hard real-time capabilities. It is fully pre-emptive with strict time constraints and guaranteed response times, meaning it can fully monitor the relevant priority of competing tasks and quickly make changes to the task priority.

Low Latency and Jitter

QNX OS 8.0 offers low latency and jitter, essential for safety, mission, and real-time systems that need deterministic, high precision, and accurate responses.

State-of-the-Art Tooling

QNX OS 8.0 offers advanced tooling ranging from an upgraded toolchain based on GCC 12 to new utilities for debugging and profiling including open-source utilities and a QNX toolkit for Microsoft® VS code to reduce developer friction.

Technical Features

Kernel

- High-resolution software timers
- POSIX scheduling policies
- Fully preemptive priority-based scheduling
- Various scheduling policies
- CPU Core Cluster support
- Symmetric multiprocessing
- Supports up to 64 cores
- Handles up to 133 million threads on a system
- Supports up to 16 TB of RAM
- Safe and secure interrupt handling
- POSIX Interprocess Communication
- QNX® Interprocess Communication with limitless message sizes
- SMMU (System Memory Management Unit) support for secure memory access
- Fast boot capabilities
- Various POSIX features

Hardware Architecture

- Armv9-A
- Armv8-A
- x86 64

Programming Languages

- C
- C++
- Python
- RUST
- ADA

Tooling

- RUST Compiler version 1.8
- QNX Momentics IDE
- QNX Toolkit for Microsoft Visual Studio Code
- GNU Compiler Collection version 12
- GNU Debugger version 14
- Command Line Tools including:
  - Address Sanitizer (ASAN)
  - Leak Sanitizer (LSAN)
  - Undefined Behavior Sanitizer (UBsan)
  - Valgrind
  - Toybox

Security

- POSIX permissions
- POSIX Access Control Lists (ACL)
- Random service generator
- Fortified system functions
- Secure Processor launcher
- Security policies
- Secure boot
- QNX® Trusted Disk (QTD)
- Pathtrust
- Address Space Layout Randomization (ASLR)
- Process manager abilities
- Generic crypto device driver
- QNX® Binary Security Check tool
- OpenSSL 3
- FIPS 140-2 Crypto Libraries

Networking

- IPv4/IPv6 multi-threaded network stack
- Unicast and multicast routing
- Packet filtering
- Internet Key Exchange (IKE)
- Wi-Fi 6
- IPSec
- Stream Control Transmission Protocol (SCTP)
- Process and network interface isolation
- Common Address Redundancy Protocol (CARP)
- Point to point protocol (PPP)

Filesystems

- SMBv3
- QNX Power Safe
- NFS
- Encrypted
- Squash
- Compressed

Graphics

- 2D and 3D hardware acceleration including but not limited to:
  - Blits
  - OpenCL
  - OpenGL
  - Vulkan
  - Vulkan SC
- Wayland
- Software and hardware rendering
- DRM servers

Host Development Platforms

- Windows 10 and 11
- Ubuntu 22 and 24
- RedHat Enterprise Linux

Virtual Development Platforms

- Virtual Box
- VMware
- QEMU

Cloud Enablement

- Cloud-enabled QNX OS 8.0 is supported by AWS, running on Graviton3 (or higher) processor family

Partner and Board Support

QNX® Board Support Packages (BSPs) provide an abstraction layer of hardware-specific software that facilitates implementing the QNX OS 8.0 on your board. Our extensive BSP library includes BSPs for SoCs manufactured by all leading hardware manufacturers. Learn more about our wide range of BSPs. To learn more about the BlackBerry QNX partner ecosystem and channel partnerships, visit our partner page.

Related Products

QNX OS for Safety

The QNX® OS for Safety is the only embedded OS certified to IEC 61508 SIL3, IEC 62304 for Class C devices, and ISO 26262 at ASIL D and ISO/SAE 21434.

Ideal for building complex safe systems, the QNX OS for Safety is a full-featured, real-time OS designed for use in every sector where reliable, functionally safe embedded software is critical: medical devices, industrial controls, aerospace, automotive, power generation, robotics, and rail transportation. It includes the safety certificates and documentation you need to correctly develop and certify your safety-critical software systems.

QNX Hypervisor

The QNX® Hypervisor is an embedded virtualization solution with a microkernel architecture that enables multiple OSs (Android™, Linux, QNX) to safely operate on the same system-on-a-chip (SoC).

This powerful virtualization solution offers virtual memory, CPUs, interrupt controllers, devices, and para-virtualized devices.

The QNX Hypervisor protects itself and your system from both internal faults and outside interference, including those of guests in virtual machines.

If a guest attempts to overstep the boundaries you set, the hypervisor prevents them from completing the action. It also includes the SMMU manager service which works with hardware System Memory Management Units to ensure that Direct Memory Access devices are contained.

Learn More

Find out more about QNX SDP 8.0 →
qnx.com/sdp8

Request an evaluation license →
qnx.com/products/evaluation

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About QNX

QNX, a division of BlackBerry Limited, enhances the human experience and amplifies technology-driven industries, providing a trusted foundation for software-defined businesses to thrive. The business leads the way in delivering safe and secure operating systems, hypervisors, middleware, solutions, and development tools, along with support and services delivered by trusted embedded software experts. QNX® technology has been deployed in the world's most critical embedded systems, including more than 255 million vehicles on the road today. QNX® software is trusted across industries including automotive, medical devices, industrial controls, robotics, commercial vehicles, rail, and aerospace and defense. Founded in 1980, QNX is headquartered in Ottawa, Canada.

Learn more at qnx.com →