QNX Russia 2012 Technology Roadmap

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Agenda

- SDP 6.5 SP 1 Update

- BSP Roadmap

- New Performance Benchmarking

- Graphics and UI Technology

- Connectivity

- Medical Overview

Continuous Improvements

SDP 6.5 SP 1

What's new in SDP 6.5 SP 1

- Kernel enhancements/bug fixes
  - Cortex A8/A9 performance improvements
  - QorIQ - 36 bit paddr support

- Networking Improvements
  - Support for ALTQ, tun/tap, autoip, ipsec

- USB Improvements
  - Support for CDC-ECM, ACM, NCM

- Bug Fixes to io-pkt, usb, file systems, def-generic, io-audio

- Delivery: July 2012

More choice, more enhancements

BSP Roadmap Update

BSP roadmap update

- Alignment with silicon partners on their current priorities:

  - AM335x from Texas Instrument

  - i.MX6x from Freescale MAD team

  - P1025 TWR from Freescale NSG team

- Also working to improve x86 support

  - SandyBridge Core^{tm} Graphics support

  - IvyBridge support

 - Intel Crownbay (Atom e6xx support)

BSP roadmap update

- Starting initiative to build reference implementations which highlight our key differentiators:
  - Real Time capability
  - Graphics - Qt demo apps
  - Connectivity – Wireless / Bluetooth integration
  - Improved OOBE
  - Market specific demos

- Initial focus on following hardware platforms:
  - AM335x
  - i.MX6x
  - P1025 TWR

BSP roadmap update

- Team currently focused on:
  - TI Jacinto 4/5
  - Jacinto 5 ECO
  - Freescale i.MX6x
  - TI OMAP 5
  - nVidia Tegra3

- Upcoming platforms:
  - Freescale i.MX7x (in the fall)
  - Jacinto 6 (future – OMAP 5 for Auto)
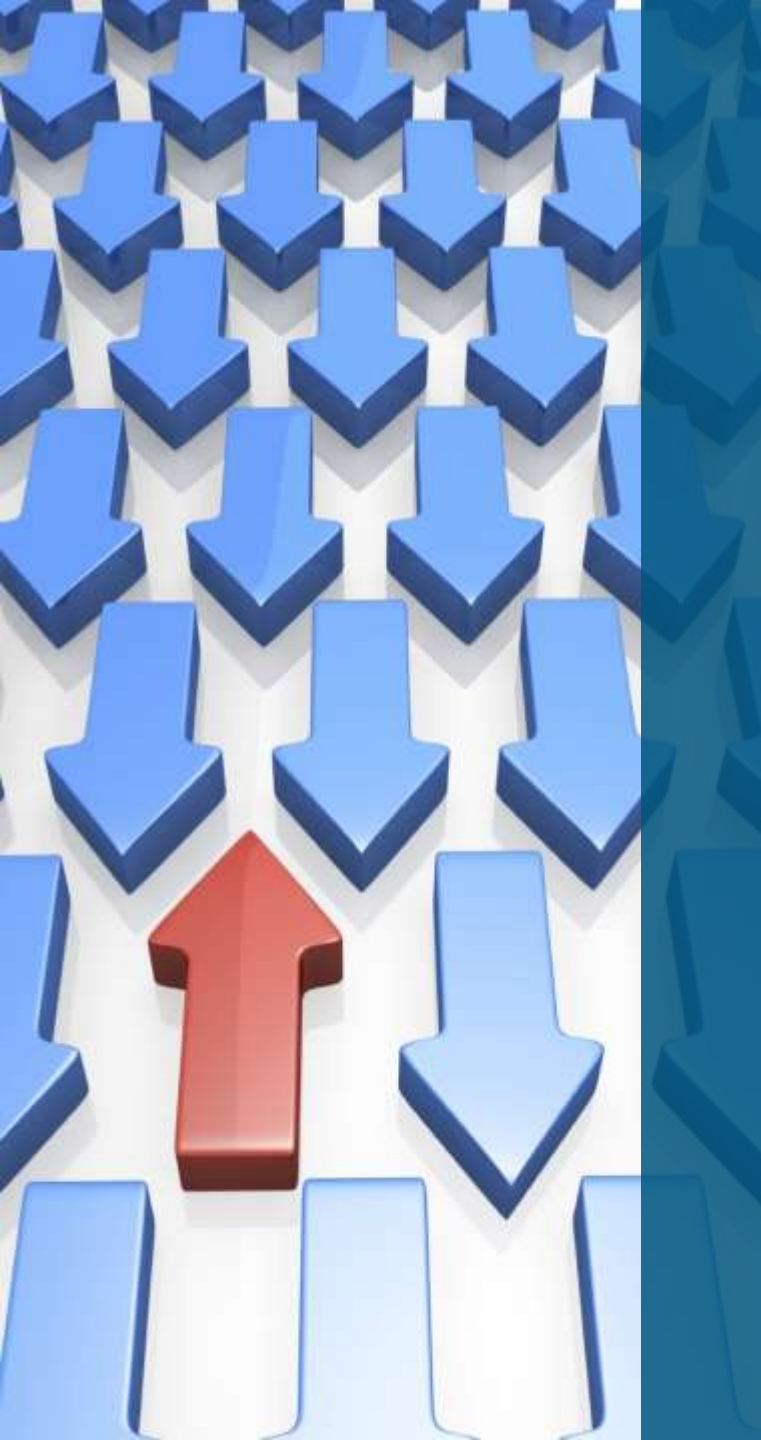
Fast, predictable performance
Performance Benchmarks

New performance benchmarks

- Dedicated Systems: professional services company specializes in real-time systems

- independent evaluations of QNX Neutrino OS on: ARM Cortex A8, Intel Atom, and Pentium

- determined that QNX offers:
  - excellent architecture
  - very fast and predictable performance
  - user-friendly development environment
  - above average documentation
  - support for many embedded platforms

- QNX scored 9 out of 10 on dimensions of architecture, documentation, tools, and performance.

Dedicated Systems benchmarks

3 Types of reports now available

— RTOS Architecture reports (Theoretical)

— Platform Evaluations

— Platform Comparison Reports

All reports can be downloaded from Dedicated Systems Portal (http://download.dedicated-systems.com/)
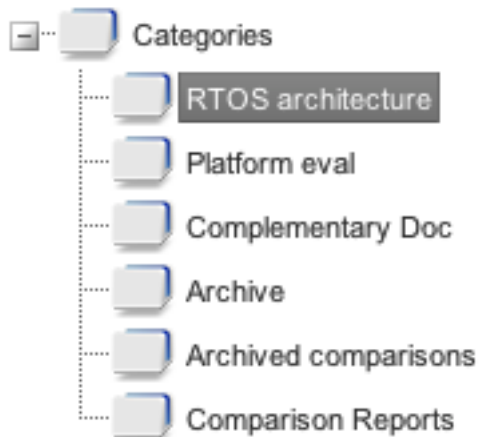
Links to QNX reports also found on QNX Neutrino RTOS Evaluation landing page at this location: http://www.qnx.com/products/neutrino-rtos/rtos_evaluation.html
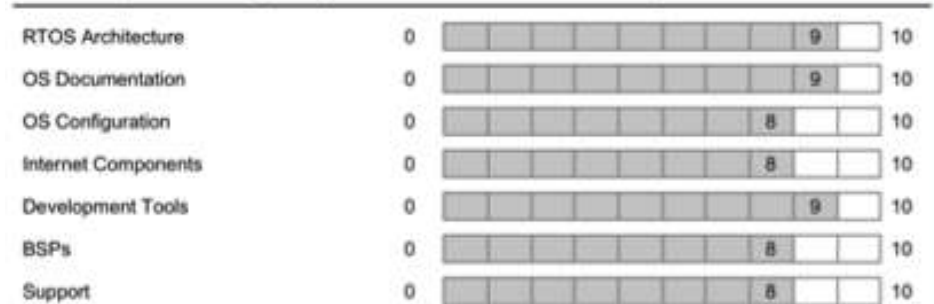
Dedicated Systems theoretical evaluations

Reports available for:

– QNX 6.5.0
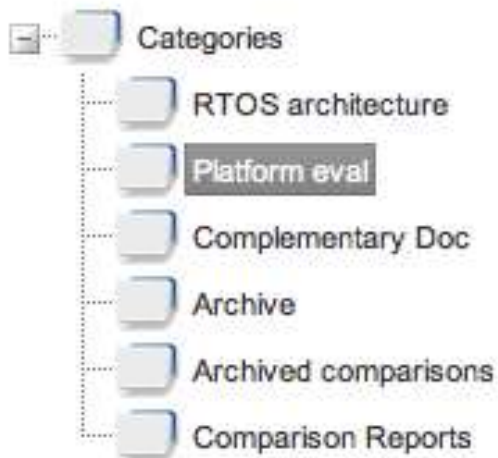
– Microsoft Compact 7

– Linux RT

1.3 Ratings

For a description of the ratings, see [Error! Reference source not found.].

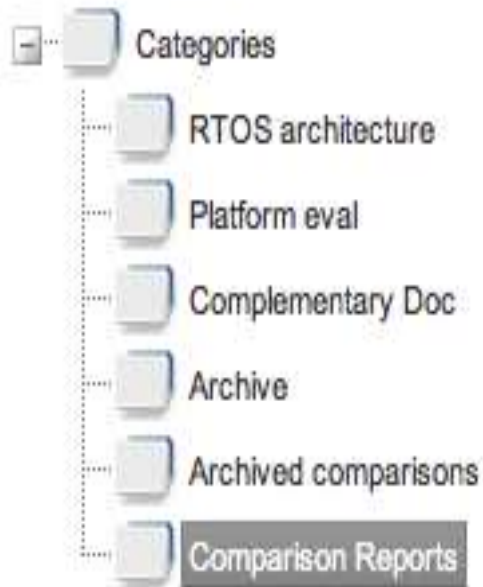|			
RTOS Architecture	0	9	10
OS Documentation	0	9	10
OS Configuration	0	8	10
Internet Components	0	8	10
Development Tools	0	9	10
BSPs	0	8	10
Support	0	8	10

Dedicated Systems platform evaluations

Reports available for:

- QNX 6.5.0 on ARM

- Android Linux 3.0.4 on ARM

- Linux RT on ARM

- Windows CE7 on ARM

- QNX 6.5.0 on Atom

- QNX 6.5.0 on x86

- Linux RT on x86

- Microsoft Compact 7 on x86

- QNX 6.5.0 on PPC

Dedicated Systems
platform comparisons

Reports available for:

— ARM comparing **QNX 6.5, WinCE 7, RT Linux 2.6.33, and Android 3.0.4**

— X86 comparing **QNX 6.5 and RT Linux 2.6.33**

Coming soon:

- ATOM comparing **QNX 6.5, Win CE7, RT Linux 2.6.33**

- PPC comparing **QNX 6.5 and RT Linux 2.6.33**

Platform comparison (ARM) clock tick processing
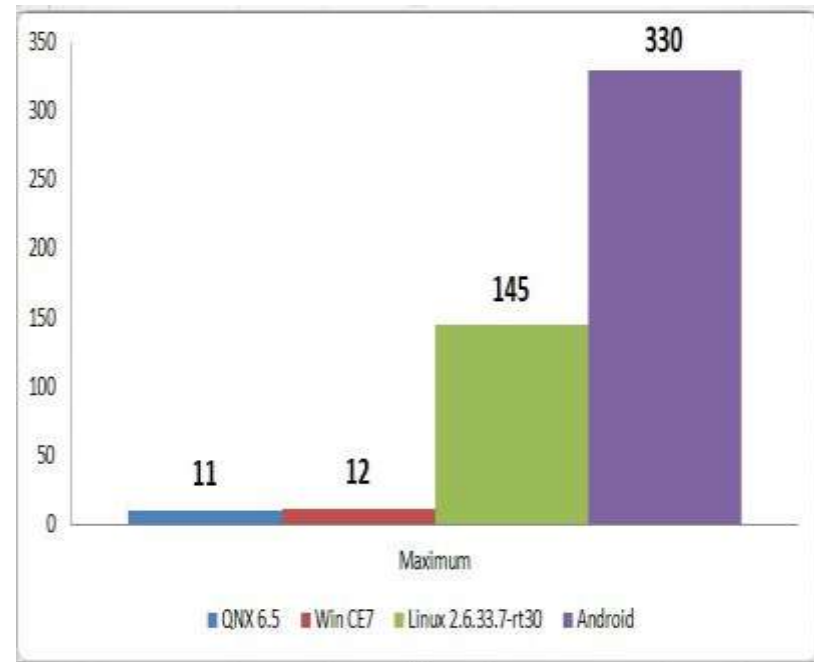
Figure 8b: _Maximum_ clock interrupt duration

Platform comparison (ARM) thread switching latency
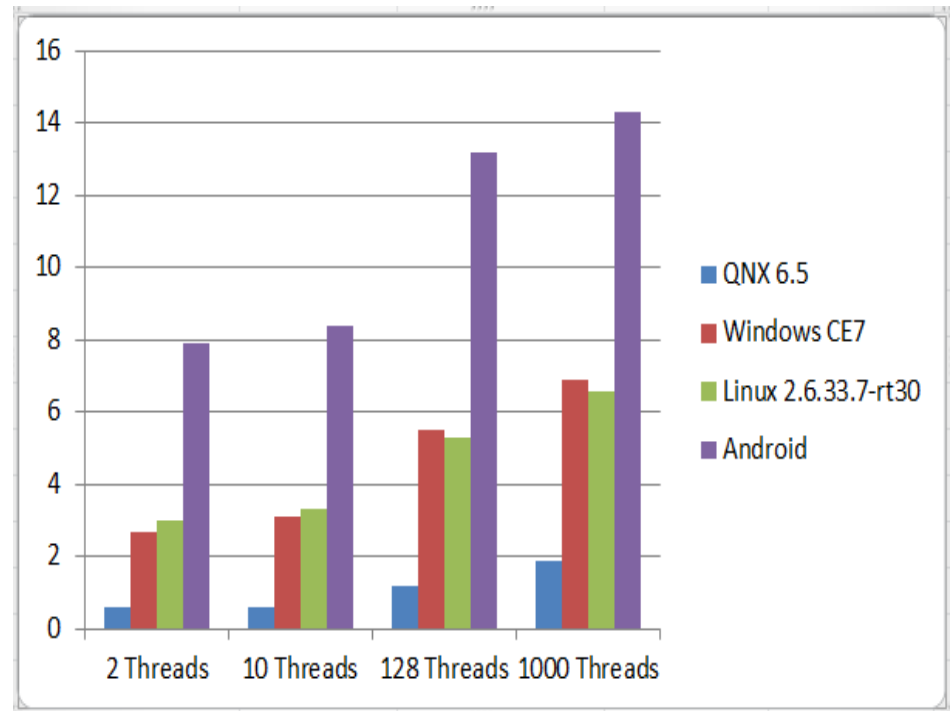
Figure 9a: <u>Average</u> switch latency between x threads, in µs

Platform comparison (ARM)
maximum sustained interrupt frequency

QNX	Windows CE7	Linux RT	Android
19*	26	43	410*

"Nevertheless, we observed clear differences in the performances of the OSs we tested. In order not to not miss any interrupts, Linux (with the RT patch) required six (6) times more time between interrupts than does QNX Neutrino. Android Linux needs almost 18 times more time."

Visually compelling and high-performing
Graphics and UI Technologies

Graphics and UI technologies

- Qt
  - Qt 4.7x and 4.81 ported to QNX SDP 6.5.0 (X86 and ARMLE - using GF/devg)
  - Available on Foundry27 (Qt Project) and qt.nokia.org
  - QNX demos available on Foundry27
  - Commercial support for Qt 4.81 from Digia Plc
  - Services and customization available from Digia, KDAB and ICS
  - In use with QNX customers today (non-commercial)

- New Screen graphics framework (i.e. composition manager, WFD, OpenGL ES 2.0, …)
  - Deployed on PlayBook
  - Integrated as part of QNX CAR 2
  - Available to CSP service customers (e.g. Harman, Panasonic, Denso, etc)
  - Not available to the general market at this time

- Photon
  - Shipped as part of QNX SDP 6.5
  - Incompatible with Screen graphics framework

Qt

- Qt 4.81
    - Available today for QNX SDP 6.5 <u>using GF/devg framework</u>
      (http://download.qt.nokia.com/qt/source/qt-everywhere-opensource-src-4.8.0.tar.gz)

- Qt 5.0
    - Available in June for QNX SDP 6.5 (including SP1)
    - Uses <u>new Screen graphics framework</u> (no GF/devg support)
    - Qt Creator tooling (Linux and Windows hosts) targeting QNX
    - All code upstreamed to public Qt code repository

- Digia will offer commercial licensing and support for Qt 4.81 and Qt 5.0

- Delivery mechanism and release level for Screen graphics framework under discussion
    - *Experimental* software preferred vs. schedule delays to reach GA status
    - Discussions underway regarding final release mechanism (i.e. Exp, Patch, GA)

- Qt is not licensed, sold or supported directly by QNX
    - Customers should go to Digia, KDAB, ICS or Qt community for support

Device Management

Connectivity

Wifi support

Partnerships in place with 3rd party suppliers

- Both relationships modeled after MPC Data model from a funding, development, delivery model and support perspective.

- Provisions in place for business development, marketing communications and sales enablement including:

  - Development and delivery of wireless training for QSS personnel

  - Wireless samples

  - Promotion of QNX expertise

  - Quarterly business reviews.

Solutions from CSR and Broadcom (in development) available for Automotive

Bluetooth support

Connect Blue offers a complete range of products; from Bluetooth starter kits for evaluation and Bluetooth modules for embedded, built-in purposes, up to complete packaged Bluetooth devices with their own housing.

These products don't require a BT stack on the Host CPU as this is included with the product.

Good solution for low volume opportunities.

connectBlue
wireless industrial solutions

Bluetooth support

SyBase iAnywhere stack currently in use for RIM products.

Cybercom blueGo and iAnywhere stack used for QNX CAR 2.

No mechanism /package available yet for GEM customers.

Working with RIM, Cybercom and iAnywhere on a solution that leverages what has been implemented.

QNX CAR™ 2 application platform overview

HTML5

QNX Software Base

Automotive Extensions

Media sources and connectivity

QNX CAR 2

Partner Technologies

freescale semiconductor

NUANCE

PANDORA

telenav

Red Bend Software

REAL VNC

TEXAS INSTRUMENTS

TCS TeleCommunication Systems
Enabling Convergent Technologies®

Vlingo

gracenote.

CYBERCOM GROUP

QNX CAR is a development platform that speeds time to market for automotive infotainment systems.

QNX

QNX CAR™ 2 high level architecture
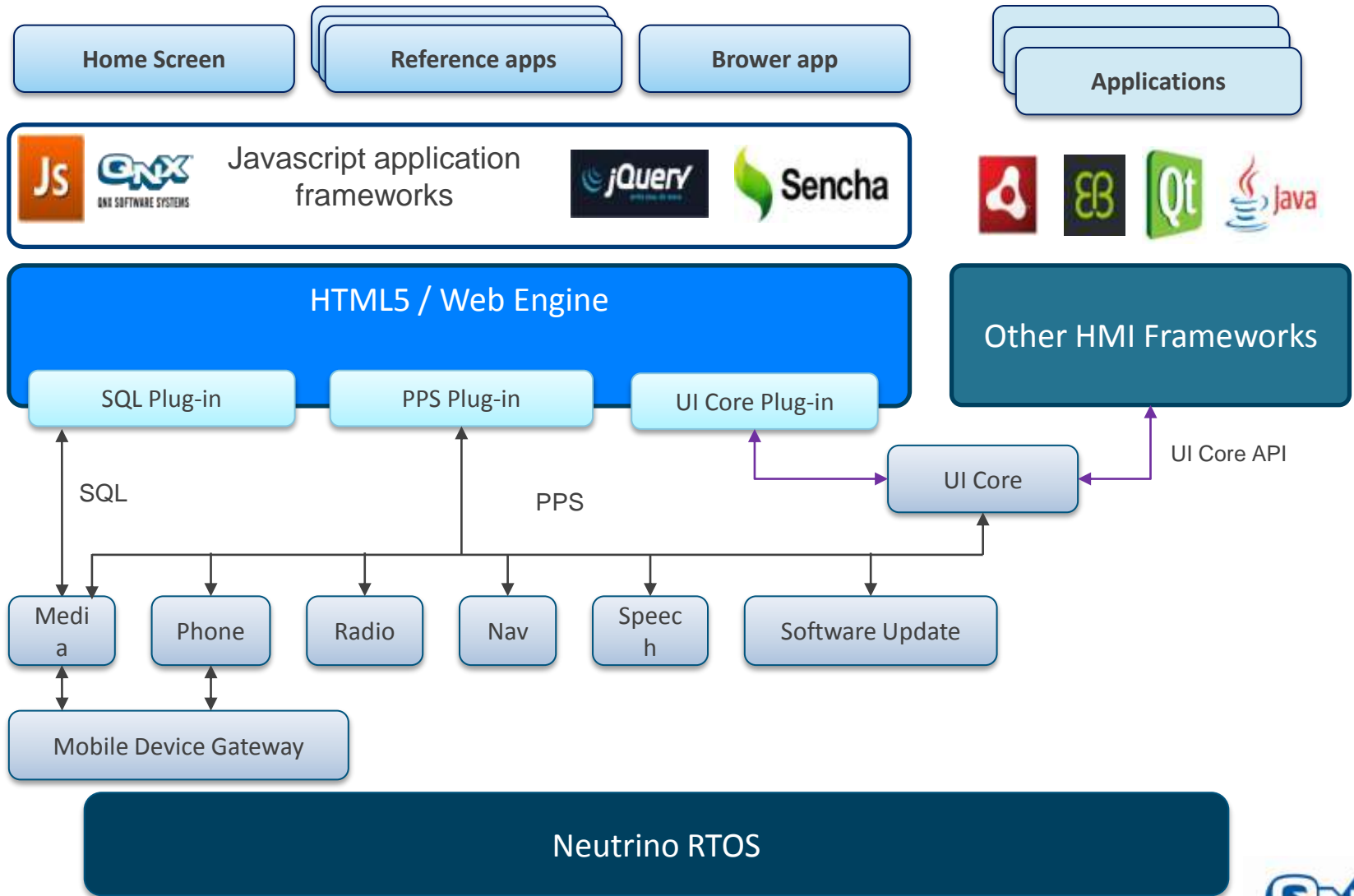
Mission-critical reliability and security

QNX® Neutrino® RTOS for Medical

![QNX logo]

QNX Neutrino RTOS for medical devices

- A version of the Neutrino kernel to help medical customers satisfy approval needs

- A component of QNX's Approval Support Package for medical customers

- Accompanied by the Declaration of Compliance to IEC 62304

- Fully API-compatible with SDP 6.5.0

- Scope: microkernel, process manager, APS, multi-core support on x86 and Power

- Supported on: x86, Power, ARM

QNX medical approval support package

- An offering to help medical customers shorten time to market by assisting them with approval

- A combination of product and services

- Customers can choose components best suited to them

- It contains:

  - QNX Neutrino RTOS for medical devices

  - On-site process audit

  - Training course: how to build a dependable system

  - Proven-in-use data

  - Neutrino medical assurance case

  - SME consultancy

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QNX SOFTWARE SYSTEMS