

QNX V6.5 ON PPC

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1 Document Intention

1.1 Purpose and scope

This document presents the quantitative evaluation results of the QNX Neutrino operating system V6.5 employed on a POWER architecture (POWER PC) based platform, more specifically on a Freescale QorIQ™ P1021 processor.

The layout of this report follows the one depicted in “The OS evaluation template” [Doc. 4]. The test specifications can be found in “The evaluation test report definition.” [Doc. 3]. See section 1.3 of this document for more detailed references. These documents have to be seen as an integral part of this report!

Due to the tightly coupling between these documents, the framework version of “The evaluation test report definition.” has to match the framework version of this evaluation report (which is 2.9). More information about the documents and tests versions together with their corresponding relation between both can be found in “The evaluation framework”, see [Doc. 1] in section 1.3 of this document.

The generic test code used to perform these tests can be downloaded from our website by using the link in the related documents section.

1.2 Document issue: the 2.9 framework

This document shows the test results in the scope of the evaluation framework 2.9.

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1.3 Related documents

These are documents that are closely related to this document. They can all be downloaded using following link:

<http://www.dedicated-systems.com/encyc/buyersguide/rtos/evaluations>

- | | | | |
|--------|--|----------|----------------------|
| Doc. 1 | The evaluation framework
This document presents the evaluation framework. It also indicates which documents are available, and how their name giving, numbering and versioning are related. This document is the base document of the evaluation framework.
EVA-2.9-GEN-01 | Issue: 1 | Date: April 19, 2004 |
| Doc. 2 | What is a good RTOS?
This document presents the criteria that Dedicated Systems Experts use to give an operating system the label "Real-Time". The evaluation tests are based upon the criteria defined in this document.
EVA-2.9-GEN-02 | | |
| Doc. 3 | The evaluation test report definition.
This document presents the different tests issued in this report together with the flowcharts and the generic pseudo code for each test. Test labels are all defined in this document.
EVA-2.9-GEN-03 | Issue: 1 | April 19, 2004 |
| Doc. 4 | The OS evaluation template
This document presents the layout used for all reports in a certain framework.
EVA-2.9-GEN-04 | Issue: 1 | April 19, 2004 |
| Doc. 5 | QNX v6.5, Theoretical evaluation
This document presents the qualitative discussion of the OS
EVA-2.9-OS-QNX-65 | Issue: 1 | May 20, 2011 |

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2 Introduction

This chapter talks about the OS that we are going to test and evaluate, and the hardware on which the OS under testing will be employed.

2.1 Overview

QNX Software Systems Ltd was founded in 1980 and has been always focused on delivering solutions for the embedded systems market.

One of the main differences between QNX and other RTOS is the fact that QNX is built around the POSIX API standard. This has its advantages as a lot of code for Linux based platforms can be compiled and run on QNX Neutrino. However, bear in mind that we are discussing a real-time operating system here.

QNX Neutrino is based on true microkernel architecture with message-based inter-process communication. For instance, drivers are just applications with special privileges, and as such they cannot crash the kernel. The concept of kernel modules which is the case in Linux is not needed here, which makes QNX Neutrino a very stable product.

Furthermore, QNX Neutrino was initially built-up as a multi-processor capable operating system (both SMP and AMP). Nowadays, this is a very important asset in today's multi- and many-core business.

2.2 Evaluated (RTOS) product

2.2.1 Software

The operating system that we are going to evaluate is the QNX NEUTRINO RTOS v6.5.0 including patch 2530, from QNX Software Systems Ltd.

2.2.2 Hardware

The hardware that was used for executing our tests for the QNX Neutrino RTOS was the Freescale QorIQ P1021 Modular Development System (MDS) board from Freescale with the following characteristics:

- Using the P1021 QorIQ™ communication processor.
- Power Architecture (P1021) dual core e500 processor running at 800 MHz (for the tests in this report, we disable one of the cores). As we use one core only, the results should be the same as on a P1012 board. The only difference between these two processors is the number of cores.
- L1 Cache: 32KB instruction and 32KB data cache (for each core)
- L2 Cache: 256KB (shared between cores, but tests run with one core only). Eight-way set-associative cache organization with 32-byte cache lines.
- 512MB DDR3 RAM (SODIMM) with ECC support running at 800MHz

3 Evaluation results summary

Following is a summary of the results of evaluating the QNX NEUTRINO RTOS v6.5.0, from QNX Software Systems Ltd.

3.1 Positive points








- Excellent architecture for a robust and distributed system.
- Very fast and predictable performance.
- Large number of board support packages (BSP) and drivers (the source for most of them is available for public) which can be easily downloaded.
- The availability of documentation which can be considered more than the average.
- Efficient and user friendly Integrated Development Environment (IDE)

3.2 Negative points

- Not all code is available in source code. Customers can apply for source access.

3.3 Ratings

For a description of the ratings, see [Doc. 3].

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