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QorIQ Multicore Processor Development

Processor Expert Software: QorIQ Optimization Suite

Overview

The QorIQ optimization suite helps optimize your application by utilizing on-chip hardware from the QorIQ processor to provide enhanced levels of visibility of hundreds of on-chip hardware events.

The first tool included in the QorIQ optimization suite is the scenarios tool. The scenarios tool provides visibility by utilizing “measurement scenarios.”

The scenarios tool is a subset of the performance analysis tools inside CodeWarrior for Power Architecture® V10 software. The QorIQ optimization suite scenarios tool was developed for users that do not own CodeWarrior and need to analyze on-chip measurements.

A measurement scenario collects specific on-chip measurement values, then combines them in such a way to provide measurements such as cache hits or misses. While many large system on chip (SoC) devices provide information from the CPU, QorIQ processors provide much more information, including the ability to monitor and count events from peripherals such as the Data Path Acceleration Architecture (DPAA). Measurement data can be displayed as an average or graphed as a sequence of points over time. This quickly exposes problems and opportunities to improve your design.

Specifically, a scenario contains the following:

- Events: Hardware occurrences that send a signal to the debug circuitry on the QorIQ processors
- Counters: Counters that can be connected (arbitrarily) to any event in the QorIQ processor, including the output of other counters in a feedback loop
- Metrics: A mathematical combination of counters (which count events) to provide an additional answer. For example, you could have a time-base counter which you divide all other counters by such that your counts are “normalized” to the time base.

Features

- Extract measurement information with either:
  - Freescale TAP
  - TCP/IP if running Freescale SDK with TCF connector enabled
- See data as an average or as a time series
- Select subsets of data to plot or average
- Save sample data to review later
- Multiple windows to display multiple measurements
- Time-based sampling
  - Determined by host computer

freescale™
QorIQ

Measurement Scenarios

CPU Scenarios

- Branch miss ratio
- Branch miss ratio—all cores
- Interrupts
- CPU usage in supervisor and user privilege
- CPU usage and IPC
- Cache operations
- Data L1 cache miss ratio
- Instruction L1 cache miss ratio
- Backside L2 cache data hit ratio
- Backside L2 cache instruction hit ratio
- Data MMU TLB, VSP reloads and L2 MMU misses
- Instruction TLB, VSP reloads and MMU misses
- Data MMU miss cycles
- Data MMU miss with data side L2 MMU misses
- Core complex traffic
- Core complex traffic—cache ops and cache inhibited accesses
- Load store unit—DLFB misses with threshold

Memory and Traffic Scenarios

- DDR traffic—system wide
- DDR traffic with page miss and collision analysis
- DDR1—only traffic with page miss and collision counts
- CoreNet traffic
- DDR traffic with command queue full
- DDR traffic with command queue full and reorder from DDR CPC1

DPAA and Peripheral Scenarios

- QMan dequeue counts
- QMan enqueue and dequeue counts
- Security engine utilization
- DPAA QMan enqueue dequeue command full
- OCeaN DMA performance

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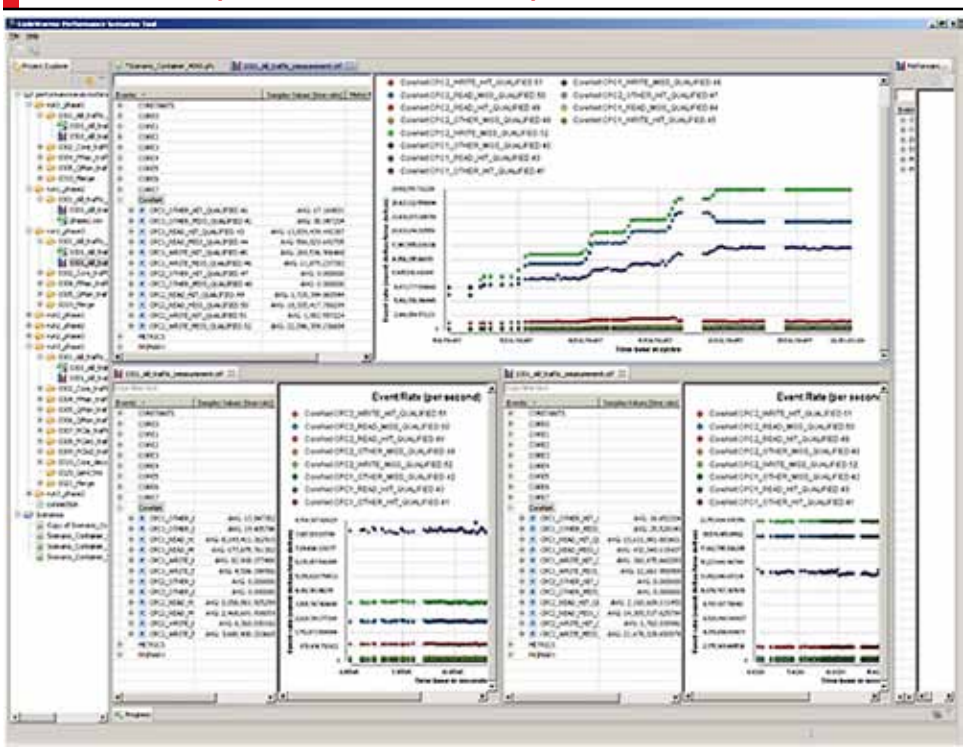

System Requirements

- Host computer system requirements
  - Microsoft® Windows Vista® (SP2) (32-bit) Home Basic, Home Premium, Business, Enterprise, Ultimate Edition
  - Windows® XP Professional (SP3), Windows 7, 32- and 64-bit
  - Red Hat Enterprise Linux® 5.4, 32- and 64-bit
  - Ubuntu 8.0.4, 32-bit, 9.10 32-bit and 10.04 64-bit
  - SuSE 11, 32-bit (tested with 11.1)
- Target system requirements
  - Compatible QorIQ device (see “Supported Devices” at **freescale.com/QOS)**
  - Connection method (you only need one of these)
- Linux operating system running the Freescale TCF connector (included in Freescale SDK for supported devices)
- Freescale TAP

Related Software and Tools

- CodeWarrior Development Studio V10 for Power Architecture technology. (Eclipse)
- USB TAP for JTAG/COP Power Architecture technology
- Gigabit TAP probe base unit

Supported Devices

The QorIQ optimization suite supports a continually growing number of QorIQ processors. For a current list of devices, visit **freescale.com/QOS**.

Getting Started

The QorIQ optimization suite is available in Linux and Windows operating systems at freescale.com/QOS. It includes online help and documentation along with 12 months of technical support. Free 30-day evaluation license available.

For more information, please visit freescale.com/QOS

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