

Introducing the Open QUICC Engine™ Technology Developer Program



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Open QUICC Engine™ Technology Program: Enabling Development of Custom Microcode

- Freescale's Open QUICC Engine developer program supports broad market and platform enablement of QUICC Engine technology
 - Program is designed to support current and future QUICC Engine technology-based processors from Freescale
 - Program is universal -- not specific to a single market segment or processor family
- Who can perform standard or custom microcode development?
 - Freescale internal QUICC Engine development teams
 - Contractor development teams - developing microcodes for Freescale
 - Third parties providing custom microcoding services and porting their own IP
 - End customers who wish to perform the development themselves
- What does the Open QUICC Engine technology program provide?
 - Documentation
 - Training
 - Standards
 - Support
 - Tools

QUICC Engine™ Technology Standard Protocols Royalty and NRE Free

Layer 1 Interfaces

- UTOPIA-L2
- 10/100/1000 Ethernet
- TDM – T1/T3/E1/E3

Layer 2

- ATM AAL 0/1/2/5
- 10/100/1000 Ethernet
- L2 Switch
- TDM – T1/T3/E1/E3
- HDLC
- BISYNC
- Serial ATM (ATM TC sublayer)
- SS7
- POS-PHY
- Ethernet in the First Mile (EFM)

Layer 1.5 – 2.5

- VLAN
- ATM to ATM switching
- ATM to Ethernet Interworking
- Ethernet to Ethernet Interworking
- AAL2 CPS switching and SSSAR
- Multi-Link PPP, Multi-Class PPP, PPP-Mux to ATM/Ethernet Interworking
- IMA over TDM / UTOPIA / Channelized
- E-MSP

Layer 3

- Policy based routing
- L3 control packets filtered to host CPU
- Parsing for Multi-field classification
- IP Header Compression

Traffic Management (IP/Ethernet)

- Shaping
- Weighted Fair Queuing (WFQ)
- Flow control

Traffic Management (ATM)

- TM 4.1 UBR, CBR, GFR, VBR
- Per VC shaping
- Hierarchical shaping
- Policing
- Congestion Control

Quality of Service

- WFQ
- 802.1 P,Q, IP TOS, DSCP

Open QUICC Engine Technology: What if a Customer Needs More?

- **Does the customer need to...**
 - Free up PowerPC® core bandwidth?
 - Customize or enhance one of Freescale's standard communication protocols?
 - Add a proprietary function or protocol as a differentiator?
 - Reduce BOM cost by integrating the functionality of ASICS or FPGAs?
 - Upgrade existing systems already deployed in the field?
- **Customers now have options to enhance or customize their solutions through:**
 - Freescale development teams
 - Freescale's third-party development partners
 - Performing their own custom development themselves

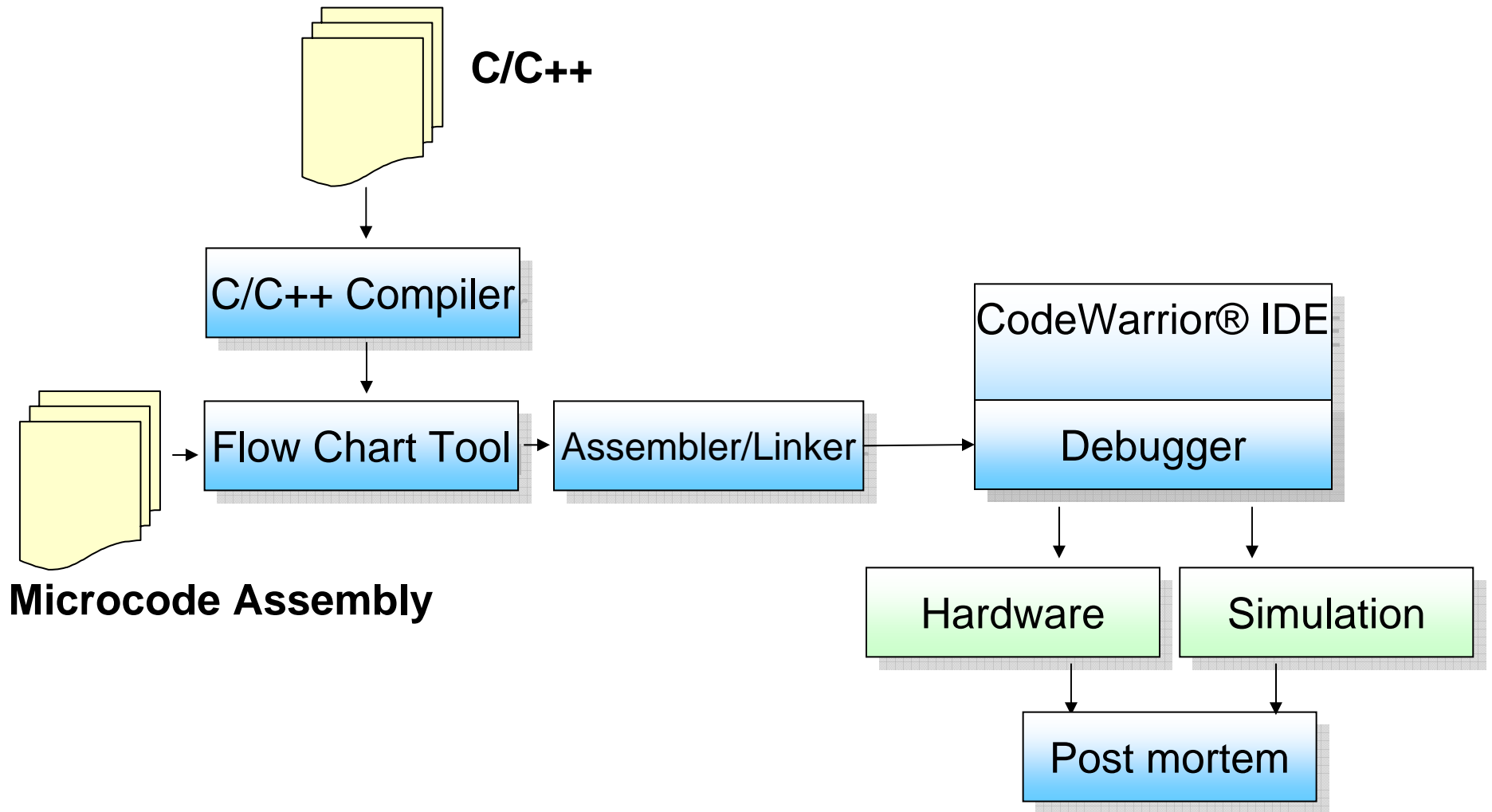
Open QUICC Engine Third-Party Engagement

- **Open QUICC Engine partnerships with third-party developers:**
 - Arabella Software: www.arabella.com
 - DoGav Systems: www.dogav.net
 - IndusRAD, Inc.: www.indusrad.com
 - Wipro Technologies: www.wipro.com
- **These companies can take customer specifications and produce application-specific microcode packages**

CodeWarrior® Development Studio for QUICC Engine™ Technology

- **Flow chart analysis/synthesis**
 - Uses microcode as input and provides graphical flow analysis
 - User can manipulate/optimize flows and output modified microcode
 - Synthesis functionality allows users to start from scratch in the flow tool, design algorithms and generate microcode as output
- **Assembler**
- **Linker**
- **C/C++ compiler**
- **QUICC Engine™ technology and PowerPC® core combination source-level debugger**
 - Full CodeWarrior tool-style debug functionality, enabling access to both the QUICC Engine and PowerPC core simultaneously
- **QUICC Engine technology and PowerPC core combination simulation**
 - Work on your microcode anywhere, sans hardware; simulate on QUICC Engine technology or PowerPC core or both
- **Post-mortem debug and profiling**

Open QUICC Engine Technology Tools and Flow



In Summary....

- Freescale is opening the QUICC Engine architecture and inviting customers to explore the application possibilities that custom microcoding can enable.
- Arabella, DoGav, IndusRAD and Wipro can engage with Freescale customers to discuss application opportunities.
- Customers and qualified third parties interested in becoming an Open QUICC Engine microcode developer can send inquiries to openqe@freescale.com

