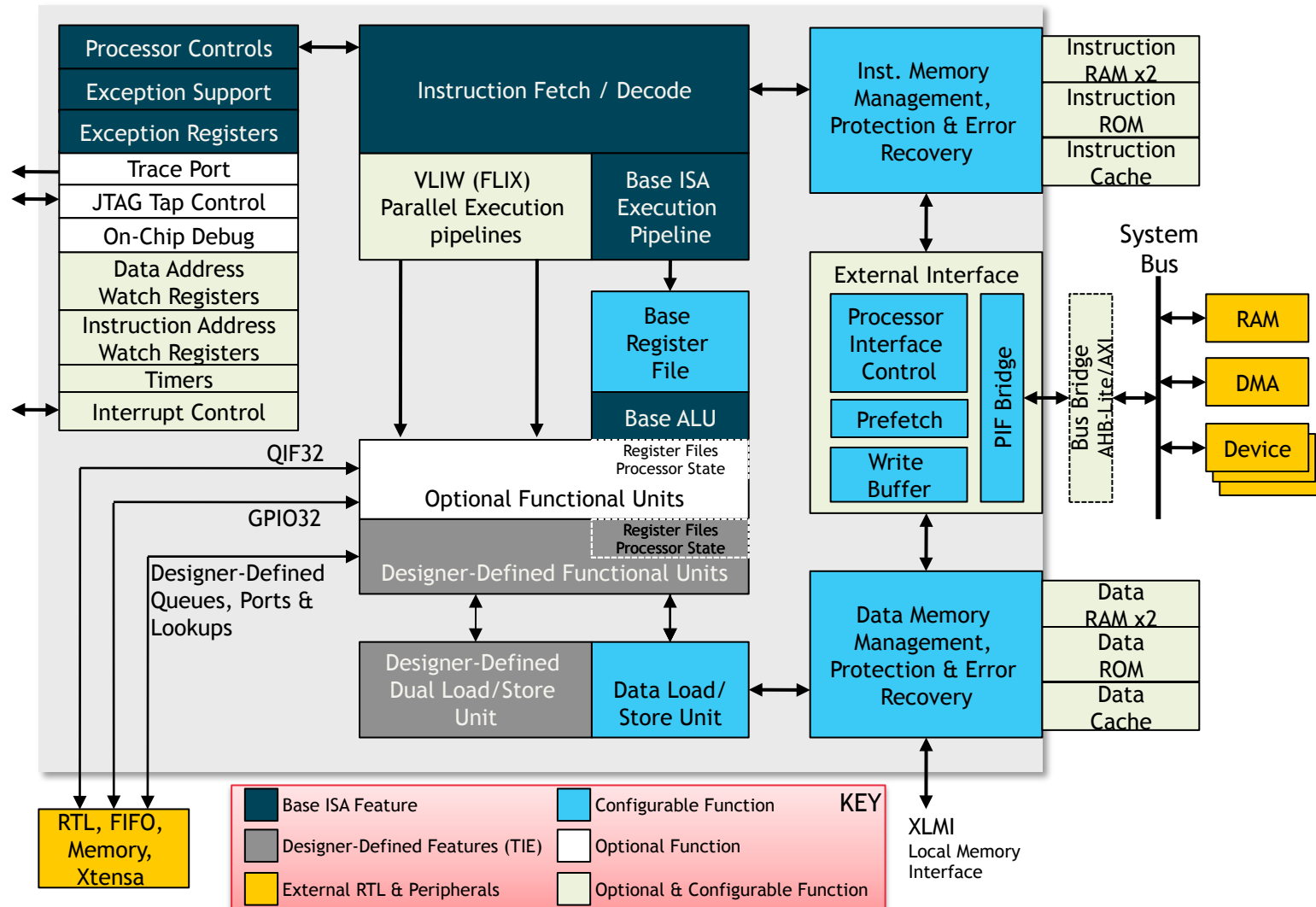




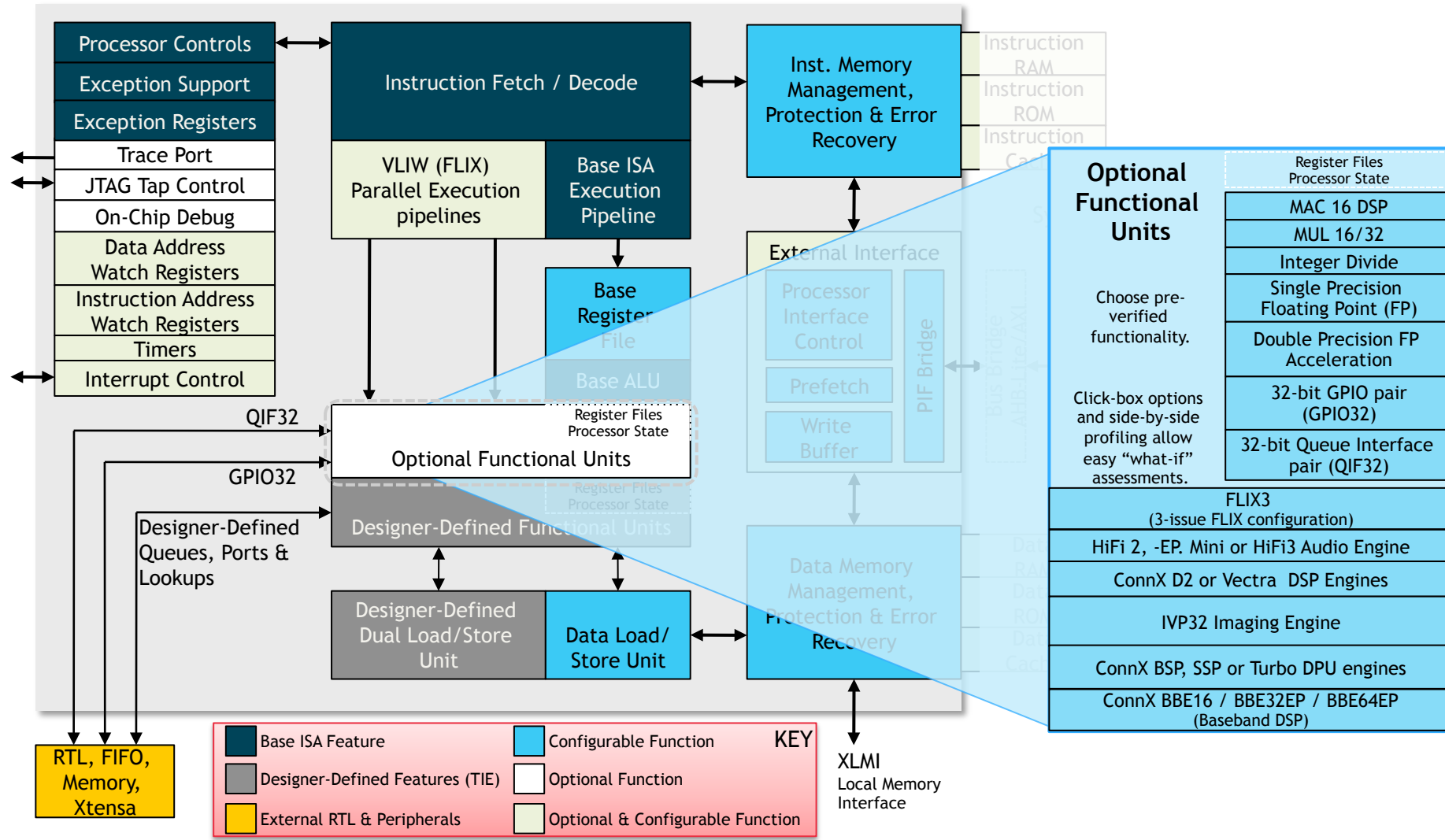
Benchmarking configurable, extensible processors: *and the embedded systems that include them*

Grant Martin, Distinguished Engineer
SEAK Workshop DAC 2014: DAC Workshop on Suite of Embedded Applications and Kernels
San Francisco
1 June 2014

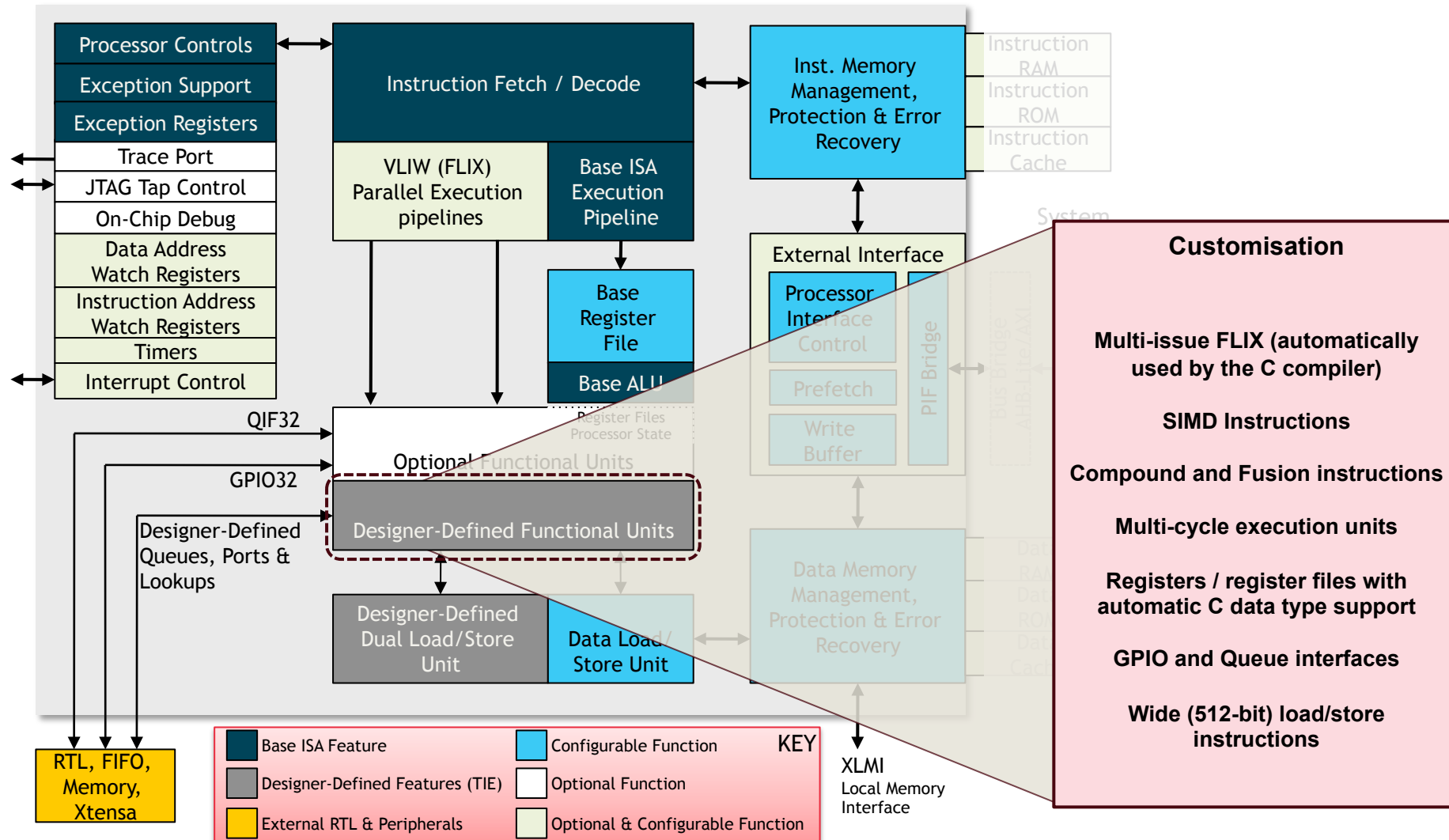
Xtensa LX6 Processor



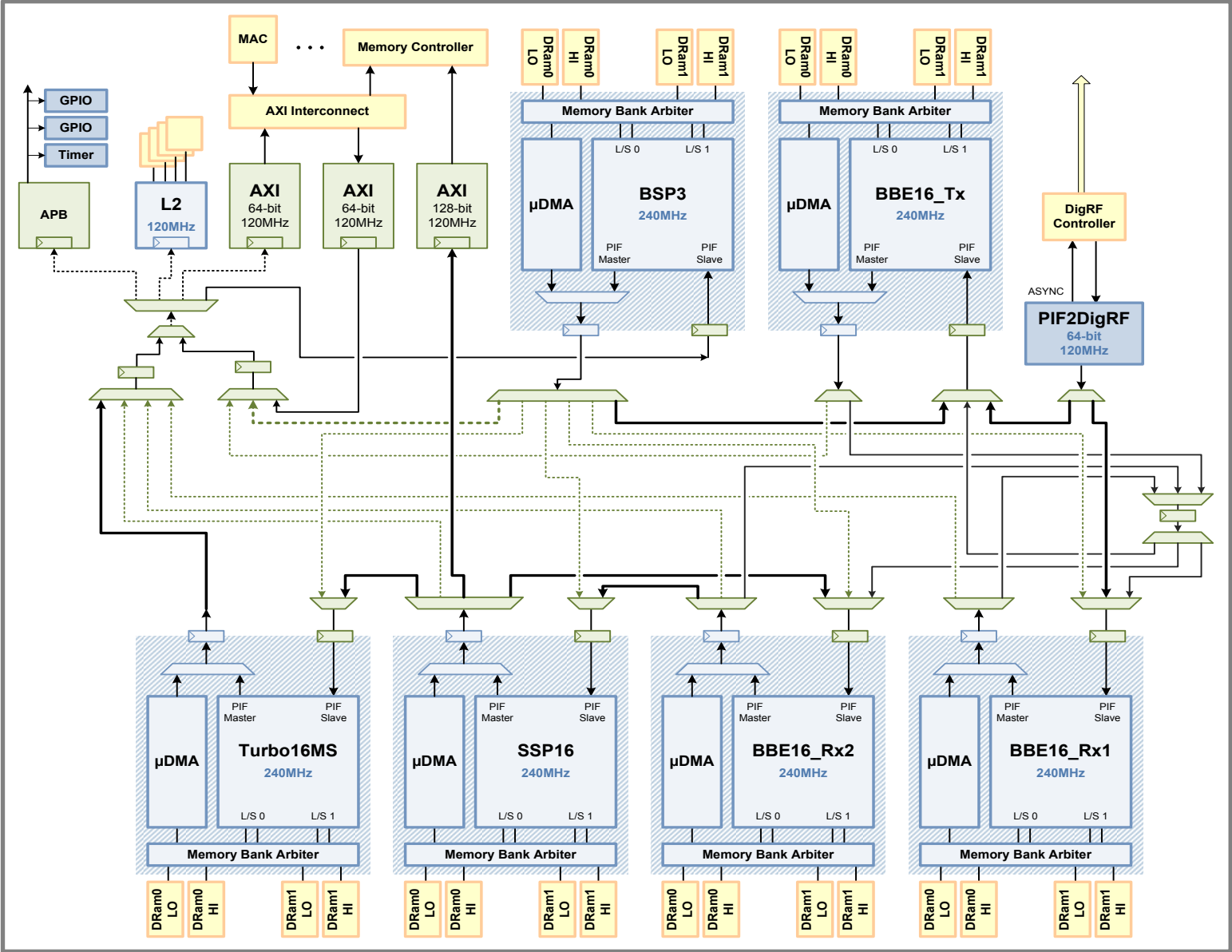
Xtensa LX6: Optional Functional Units



Xtensa LX6 - Customisation



Heterogeneous multiprocessor subsystem for LTE baseband



Observations on Benchmarking and Evaluation

- **Configurable, extensible processors add a new dimension to any evaluation**
 - Not just generic or optimised software on standard platform
 - Adds a wide range of possible PPA through using highly application or even algorithm specific instruction extensions
- **Subsystems of heterogeneous extensible processors explode the design space**
 - The cross product of all possible PPA tradeoffs across all possible processors and architectures is very large
- **Design space exploration and evaluation methods must seek to make this problem tractable**
 - This technology gives key advantages to many embedded systems
 - Not using it is a mistake in the areas where it works well
 - Design teams must be aware of the possibilities and have workable methodologies to evaluate
- **More research needed**

cā dence[®]