Tutorial M6 Outline

OUTLINE OF THE TUTORIAL

Reconfigurable Systems
- FPGAs, Parallel Computers, and their Synergism
- Programming challenges
- Scalability Challenges
- Reconfigurable Computing Boards
- Network/Grid Based Systems
- Reconfigurable Cluster Systems
- Massively Parallel Reconfigurable Systems

Compilers for Reconfigurable Supercomputers
- Compiling for hardware/software
- Commercial compilers (Frontier Design, Celoxica, Matlab compiler)
- Research compilers (Stream-C, Chameleon, DeFacto)

Tools and Visual Reconfigurable Programming
- THE Viva™ PROGRAMMING TOOL
  - Viva™ Graphical User Interface
  - Constructing Viva™ objects
  - Viva™ Input and Output
  - System Objects
  - FPGA Implementations
- THE CORE FIRE™ DEVELOPMENT SUITE.
  - An introduction to CoreFire™.
  - From design to implementation: using CoreFire™
  - Combining GUI design entry and debug tools with CoreFire™ cores.

APPLICATIONS

Background computational needs
Cryptography Applications
- Elliptic curve cryptography
- The Advanced Encryption Standard
- Library development for cryptography reconfigurable hardware
- Functional requirements
- Data path requirements "compiler" requirements

Computational Biology Applications
Image Processing Applications
An example using extant hardware
- The hardware artifact
- The software environment
- A current implementation

HANDS-ON AND DEMOS (1/2 Day)
Experience with TWO Machines (1:30-3:00 P.M.)
Using the SRC Machine
- Running Simple Code (C or Fortran) on Microprocessor
- Using the MAP Compiler
- Using External Macros
- Compiling/synthesizing and running
- A Simple Exercise: Creating Tripple-DES from A DES Module

Using Starbridge and Viva
- Thinking Recursively
- Objects, Sheets and Systems
- Creating Tripple-DES from DES

SRC and Starbridge Projects (3:0-5:00 P.M.)