

Communication Protocols

RASSP E&F Module Number: 25

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Module Objectives:

To educate the designer on the concepts, methods, and standards of communication protocols.

Specific Objectives:

Provide information on:

- 1) Overview of Current Practice in Design
- 2) Description of the Virtual Prototyping Process
- 3) Relevant Documents and Standards for Virtual Prototyping
- 4) Abstraction Levels and Limitations of Virtual Prototyping
- 5) Approaches to Virtual Prototyping
- 6) Case Study of the Lockheed Sanders Infrared Search and Track System (IRST) Design
- 7) Lessons Learned

Prerequisites:

Prerequisite Modules:

RASSP Methodology Overview

Prerequisite Knowledge:

Some knowledge of hardware description languages

Syllabus:

- 1) Introduction (20 Mins)
 - a) Architecture Selection
 - b) Types of Buses
 - c) Performance Considerations
- 2) Scalable Coherent Interface (SCI) (70 Min.)
 - a) SCI Overview
 - b) Logical Level View
 - c) Coherence Level View
 - d) Physical Level View
 - e) Pros and Cons
 - f) An Example of 2-D FFT
- 3) RACEWAY (30 Min.)
 - a) RACEway Overview
 - b) Crossbar ASIC
 - c) Fat-Tree Topology
 - d) Software Architecture
 - e) Features of RACEway
- 4) Futurebus + (30 Min.)
 - a) Futurebus Overview
 - b) Architecture
 - c) Protocols
 - d) Specifications and Features
- 5) PI-Bus (30 Min.)
 - a) PI-Bus Capabilities
 - b) Guidelines
 - c) Features of PI-Bus

Audience:

System design engineer, digital design engineer, first year graduate student.