

# Advanced Computer Systems Architecture

## Chip-Multiprocessors: Applications and Architectures

CSE 526M

Prof. Patrick Crowley

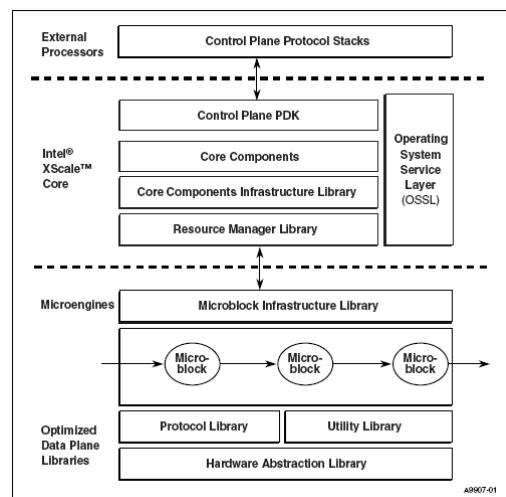
## Plan for Today

- Questions
- Today's discussion

## Objective

- Structure of IXA Applications
- Building Microblocks and Dispatch Loops
- Simple Receive, Process and Transmit shell
- Simulating with Packet Streams

## Intel IXA Portability Framework



See: IXA Portability Framework Developer's and Reference Manuals

## Microblocks 1

- Structured code that runs on microengines
- Meant to be interchangeable, composable blocks of functionality
- In full blown IXA spec, microblocks should have a control counterpart (e.g., core) on XScale

## Dispatch Loop

- An infinite loop that manages flow between microblocks on a single microengine
- Dispatch loop state (dl\_\*) is used to pass information between microblocks, but *this is only a programming convention*

## Anatomy of a Dispatch Loop

- Example project

## Dispatch Loop State

- dl\_buf\_handle
- dl\_next\_block
- Dispatch loop meta state
  - Lots of extended information stored here, but is a bit arcane

## Microblocks 2

- Implementations are written into their own files
- Application-specific dispatch loops include microblocks, and coordinate flow between blocks

## Organizing Your Files

- [Dir] Application
  - [Dir] dispatch\_loop
    - [Files] dispatch loop implementations
    - [File] dl\_system.h
  - [File] Project .dwp file
  - [Files] Microblock implementations

## Full Blown Example

- Example Project

## Using the Packet Simulator

- Enable packet generation and transmission
  - “Simulation->Enable Packet Simulation”
- Add one or more MSF devices
  - “Simulation->System Configuration->MSF Devices”
    - (x2) x32MPHY4, 4 ports, POS3 protocol, rest defaults
    - “->Network Connections”, connect rx and tx
- Create one or more streams of packets
  - “Simulation->Data Streams”
    - CSE526\_PACKETS, Ethernet IP
    - Frame content doesn't really matter now, but will later
- Assign packet streams to MSF devices
  - “Packet Simulation->Traffic Assignment”

# Assignment

- Commentary:
  - Download the sample full blown application and project and implement a different process step (currently it counts packets seen). In your commentary, describe your processing step and include your code.