

GEORGIA INSTITUTE OF TECHNOLOGY

College of Computing

CS8803J — High-Performance Communication

Spring 2002

CS8803J	Issued: January 28, 2002
Project 1	Due: February 13, 2002

Purpose: This project introduces Intel's ACE framework. The framework permits mixed StrongARM and microengine code for the IXP1200. The work is mostly done on hardware.

Reading: ACE SDK Tutorial
`/net/hp31/ixpdev/doc/howto/*`

Problems:

1. Warmup
2. Tutorial
3. Stack ACE

To turn in: Turn in a write-up that describes your solutions to the problems including all codes and performance data.

Collaboration: (*As in the syllabus*) collaboration on projects and homework in **pairs** is encouraged. If you work in a pair, turn in one write-up with the names of both collaborators. You're welcome to discuss high-level concepts with other groups, but all homework solutions must be worked out and written up separately.

NOTE: support files for this assignment are available via NFS on CoC machines in the following directory:

`/net/hp82/softarch/cs8803j/`

Problem 1: Warmup

A: Use ssh to connect to one of `ilab2`, `ilab3`, ... or `ilab8` and login as yourself. Ping `target` (the attached BV board) to make sure it's alive. If not, boot it. Use telnet to connect to the target. Note that on, e.g., `ilab2`, the BV's address is `target` while from outside `ilab2` it's `ilab2-ixp1`.

B: Observe that you can read and write `/net/hp31/<yourname>` from the `ilabN` machines, the BV cards, and the rest of CoC. You may have to modify protections in your directory to permit the BV to read your files when you're logged in as root on the BV. We advise that you do not let the BV write anything in your directory or read your top-level directory.

C: Use utility programs (in `ixpdev/host-tools/bin`) on the ilab machines to send and receive single packets to arbitrary MAC addresses on the private network. Show that you can send a packet from one ilab and receive it on another.

Problem 2: ACE Tutorial

A: Read and follow the instructions in the ACE tutorial document. Demonstrate the count programs by using an ilab to send packets to one of the BV boards.

B: OPTIONAL: test your transmitter code from Project 1 using the count application to receive packets.

Problem 3: Stack ACE

This last problem has you make an ethernet interface for the StrongARM to the private network using a Stack ACE. You might use an L3Forwarder Library ACE to select packets. Beware of creating a forwarding loop, however!

A: Add a Stack ACE such that packets with an IP address of `10.0.1.20N` (for `ilabN-ixp1`) are forwarded to Linux on the StrongARM core. Packets originating in Linux with destination on the `10.0.1.*` net should be forwarded out a microengine port.

B: Verify that you can send packets between the StrongARM and the ilab machines using this new path.