Name: _____

Experiment *1.9*

Microengine Frame Forwarding Code

Purpose

To learn how to forward packets in an IXP1200.

Background Reading And Preparation

Read about transmitting frames in microcode on the IXP1200 in Sections 25.14 and 25.15 of Network System Design with Network Processors. See Chapter 26 for an example ACE. Also read the Intel IXP1200 Programmer's Reference Guide for microcode details.

Overview

Create a MicroACE that forwards packets according to a classification tag.

Procedure And Details (checkmark as each is completed)

_____ Learn how to modify the destination port of a frame from microcode.

_____ Create microcode for a dispatch loop to run a microblock and take different packet handling actions based on the value placed in dl_next_block register by the microblock.

dl_next_block	Action
IX_BUFFER_NULL	Drop
1	Set Dst Port 0. Send to next microblock.
2	Raise frame as exception #1.
3	Set Dst Port 1. Send to next microblock.
4	Set Dst Port 2. Send to next microblock.
5	Raise frame as exception #2.

_____ Create a StrongARM exception handler that performs one of two actions on the exception code.

Exception Code	Action
1	Copy the frame. Set the Dst Port of the first frame to 1, and the second frame to 2. Send both frames to the default target.
2	Set the Dst Port to 2. Send the frame to the default target.

_____   Obtain a MicroACE that sets the dl_next_block value according to a Classify[] macro. Insert your microcode into the dispatch loop after the Classify[] macro, and your exception handler in place of the default exception handler of the MicroACE's StrongARM component.

_____   Compile and test the MicroACE. Connect an IXP1200 to three separate LANs and generate traffic on each. Use the application command to change the classifcation tag for each incoming frame. Check that frames get forwarded appropriately for each tag.

Optional Extensions (checkmark options as they are completed)

_____   Create your own classifier microblock (see Lab 6) and use it in place of the MicroACE shell.

_____   Extend the exception handling code for type 2 exceptions so that it maintains state about open web connections that pass across the network processor. Have the ACE report the number of open web connections via a crosscall.

_____

Notes