David Bozarth
CES 440
28 Nov 2004

Homework #9

5. I will give costs for the two methods, and compare them.

Cost of router memory:
(5 routers)(0.01 $/byte) = 0.05 $.router/byte
  .. this is the cost of router memory for each byte of overhead

Total time of use over 2 years:
(40 hr/wk)(52 wk/yr)(2 yr)(3600 s/hr) = 1.4976×10^7 s

Operating at full capacity over this period of time, there are
((1.4976×10^7 s) / (1000 s/session))(200 pk/session)(4 hop)(10^{-8} $/(byte.hop))

    = 0.119808 $.pk/byte .. this is what it costs to send 1 byte of overhead for all packets for 2 years.

- - - - - - - - - -

In the Virtual Circuit case, the cost of transmitting all the overhead:

    (0.119808 $.pk/byte)(3 byte/pk) = $ 0.359424

For Virtual Circuit, the cost of the router memory is:

    (0.05 $.router/byte)(11 byte/router) = $ 0.55

So the cost of the Virtual Circuit method over 2 years is:

    $(0.35924 + 0.55) = $ 0.909 per concurrent circuit

- - - - - - - - - -

In the Datagram case, the the cost of transmitting all the overhead:

    (0.119808 $.pk/byte)(15 byte/pk) = $ 1.79712

For Datagram, the cost of the router memory is:

    (0.05 $.router/byte)(15 byte/router) = $ 0.75

So the cost of the Datagram method over 2 years is:

    $(1.79712 + 0.75) = $ 2.547 per concurrent message

- - - - - - - - - -

The Virtual Circuit method is cheaper by $ 1.638 per concurrent message

---

7. The successful routes are: ABCD, AGHD. The unsuccessful routes are: ABCF, ABEG, ABEF, AGEF, AGHF, AGEB.

This is a total of (8 routes)(3 hops/route) = **24 hops of bandwidth**

---

9. C's new routing table (horizontal):

destination:	A	B	C	D	E	F
hops:	11	6	8	3	5	8
through:	B	B	E	D	E	B