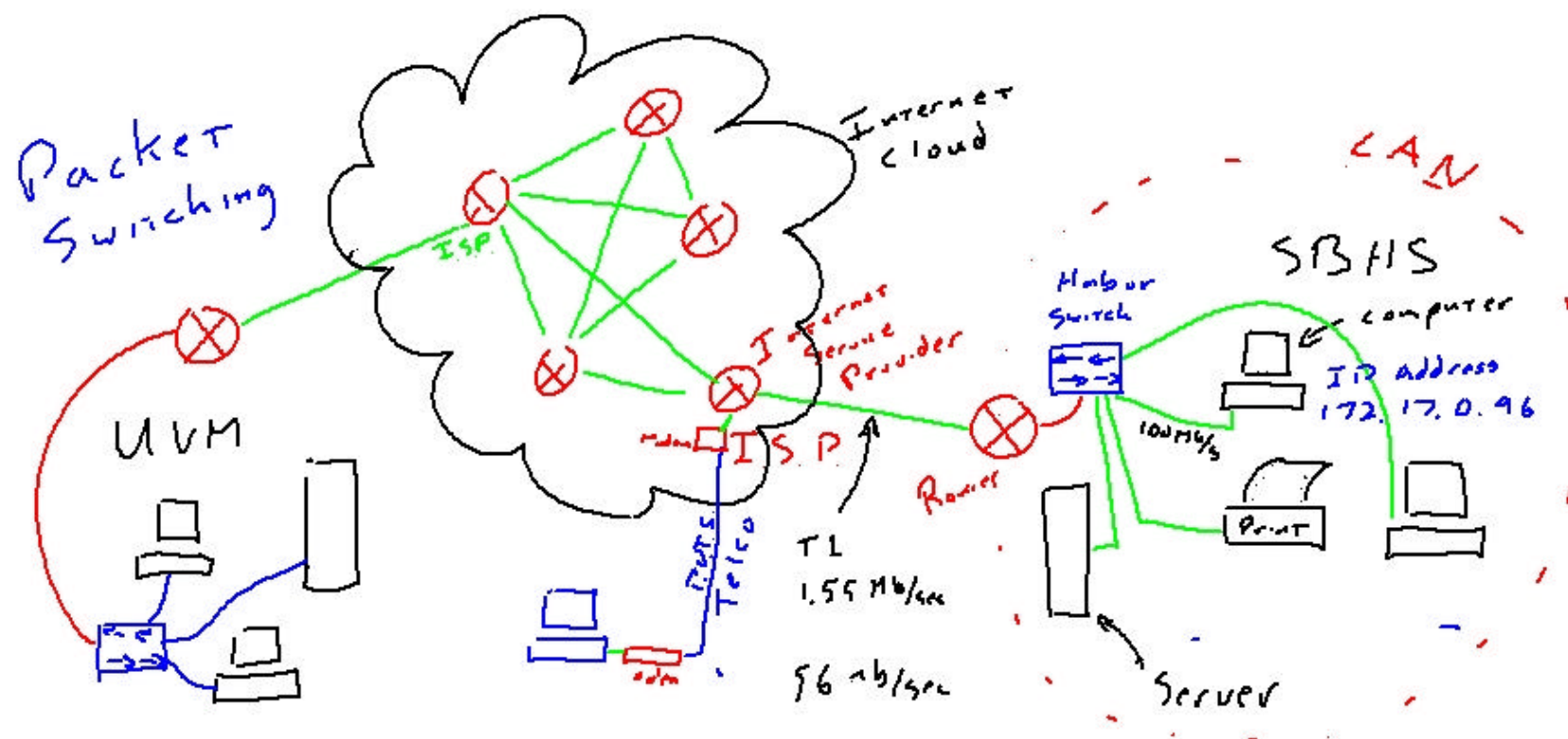


Ubiquitous Mirrors: Turning Clients Into Servers



and answering fun
questions in the process

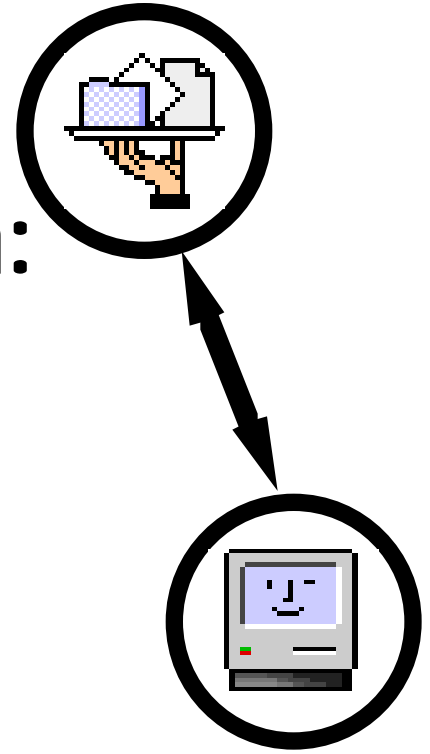
1. First off, the basics.

A (quick & easy) introduction:

What are Mirrors?

Why are they useful?

What are alternatives to Mirrors?



2. What are we trying to do?

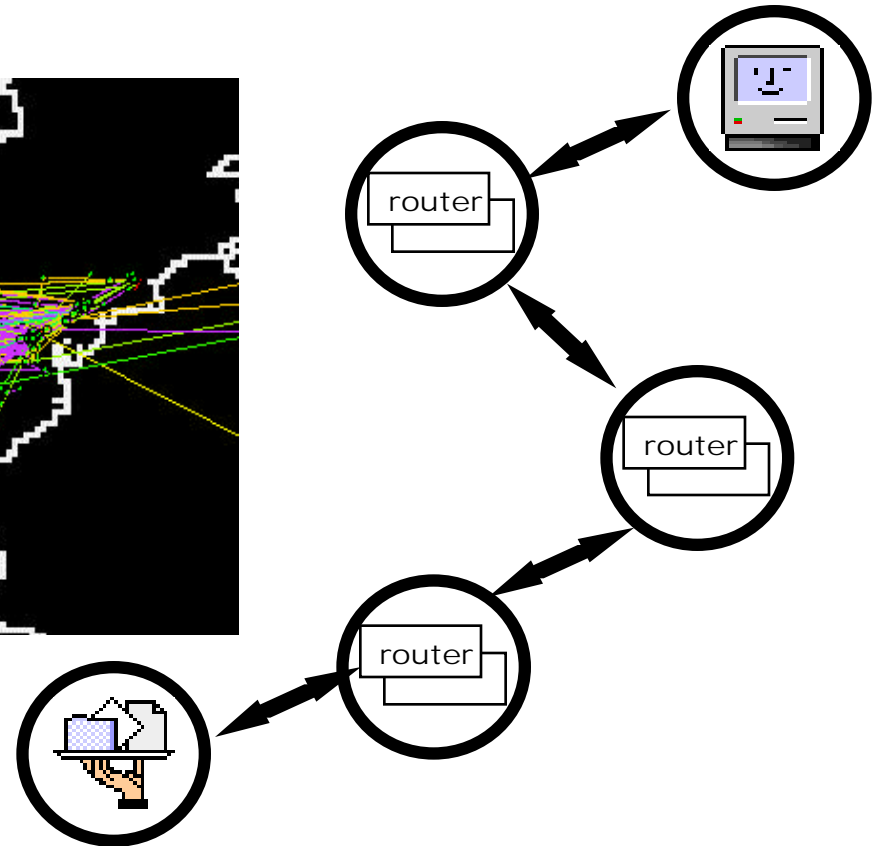
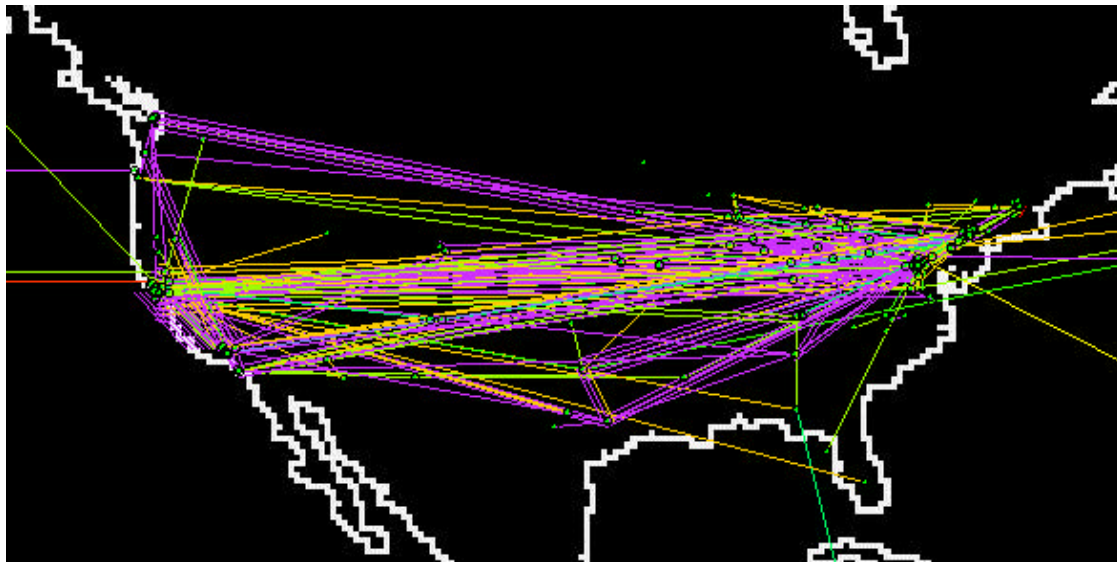
A) On the Mac side, we've created a Mirror application for the Macintosh.

B) On the Apache side, we've created cgi-bin applets to run on a front end Web server.

C) We want to answer a few cosmic, important, academic questions.

3. What about Physical vs. Network location on the Internet

(this is what suckered you folks to coming to my session, anyways; right?)



An optimum Traceroute (I wish we could all have this kind of connectivity):

```
terminator-myke:; traceroute nic-131-c209-156.mw.mediaone.net
traceroute: Warning: cchecksums disabled
traceroute: Warning: Multiple interfaces found; using 141.213.231.10 @ hme0
traceroute to nic-131-c209-156.mw.mediaone.net (24.131.209.156), 30 hops max, 40
byte packets
 1  v-umce-rsug.c-arb4.umnet.umich.edu
    (141.213.231.2)  0.392 ms  0.266 ms  0.258 ms
 2  pc-arbrlks2.c-arb2.umnet.umich.edu
    (141.211.0.233) 15.352 ms  7.673 ms 39.936 ms
 3  atm3-0x8.michnet8.mich.net
    (192.122.183.77) 0.788 ms  0.662 ms  0.720 ms
 4  198.108.90.18
    (198.108.90.18) 1.246 ms  1.299 ms  1.129 ms
 5  AAWMI-UBR-B-pos-2-0.mw.mediaone.net
    (24.131.2.54)  2.365 ms  1.774 ms  1.746 ms
 6  nic-131-c209-156.mw.mediaone.net
    (24.131.209.156) 9.651 ms * 9.259 ms
```

A Typical Traceroute from Home

(what I see when I connect from Apple's "preferred" ISP, Earthlink)

```
terminator-myke:; traceroute dialup-166.90.236.132.dial1.detroit1.level3.net
traceroute to dialup-166.90.236.132.dial1.detroit1.level3.net (166.90.236.132), 30 hops
max, 40 byte packets
```

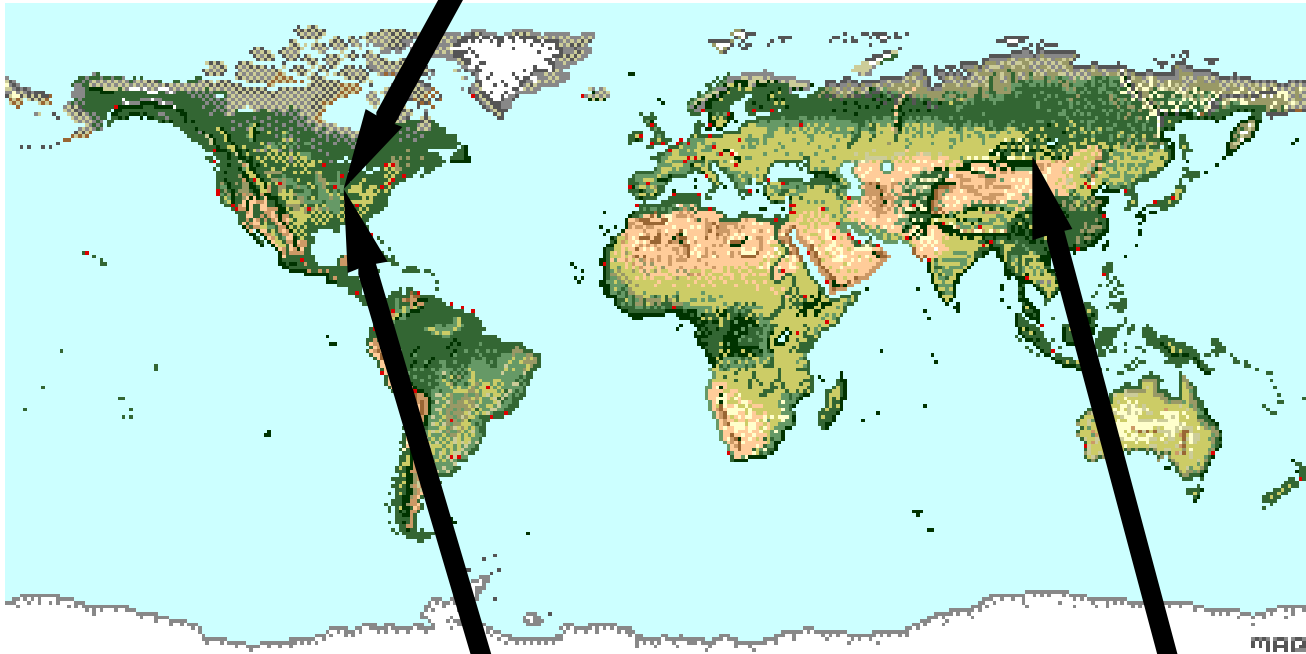
```
 1  v-umce-rsug.c-arb4.umnet.umich.edu
    (141.213.231.2)  0.389 ms  0.251 ms  0.239 ms
 2  pc-arbrlks2.c-arb2.umnet.umich.edu
    (141.211.0.233)  2.173 ms  7.392 ms  1.750 ms
 3  atm3-0x8.michnet8.mich.net
    (192.122.183.77)  0.694 ms  0.662 ms  0.729 ms
 4  iar1-serial2-2-0-0.Chicagochd.cw.net
    (208.172.10.137) 16.356 ms 15.801 ms 16.000 ms
 5  acr2-loopback.Chicagochd.cw.net
    (208.172.2.62)  15.908 ms 15.750 ms 16.012 ms
 6  cable-and-wireless-peering.Chicagochd.cw.net
    (208.172.1.202) 37.829 ms 37.857 ms 37.344 ms
 7  so-4-0-0.mp1.Chicago1.level3.net
    (209.247.10.161) 37.899 ms 38.150 ms 38.160 ms
 8  so-0-1-0.mp2.Detroit1.level3.net
    (64.159.0.198)  37.600 ms 37.796 ms 37.875 ms
 9  gig9-1.hsa2.Detroit1.level3.net
    (64.159.0.214)  38.355 ms 38.624 ms 38.121 ms
10  nas23.det1.Level3.net
    (209.244.42.215) 40.541 ms 40.406 ms 40.243 ms
11  dialup-166.90.236.132.Dial1.Detroit1.Level3.net
    (166.90.236.132) 191.224 ms 188.566 ms 189.623 ms
```

A Traceroute from MacHack!

(if we were really in New York, I'd take everyone out for Coney Dogs)

```
terminator-myke:; traceroute dsl092-112-130.nyc2.dsl.speakeasy.net
traceroute: Warning: ckecksums disabled
traceroute: Warning: Multiple interfaces found; using 141.213.231.10 @ hme0
traceroute to dsl092-112-130.nyc2.dsl.speakeasy.net
(66.92.112.130), 30 hops max, 40 byte packets
 1 v-umce-rsug.c-arb4.umnet.umich.edu
   (141.213.231.2)  0.475 ms  0.333 ms  0.270 ms
 2 pc-arbrlks1.c-arbl.umnet.umich.edu
   (141.211.0.241)  0.424 ms  0.512 ms  0.386 ms
 3 atm3-0x7.michnet8.mich.net
   (192.122.183.73)  0.689 ms  0.757 ms  0.741 ms
 4 iar1-serial2-2-0-0.Chicagochd.cw.net
   (208.172.10.137) 15.995 ms 16.046 ms 15.625 ms
 5 acr2-loopback.Chicagochd.cw.net
   (208.172.2.62)  16.316 ms 17.492 ms 15.819 ms
 6 acrl-loopback.NewYorknyr.cw.net
   (206.24.194.61)  33.175 ms 33.434 ms 33.194 ms
 7 iar2-loopback.NewYorknyr.cw.net
   (206.24.194.24)  33.974 ms 33.467 ms 33.852 ms
 8 internap-network-services.NewYorknyr.cw.net
   (208.173.135.66) 33.651 ms 33.422 ms 33.468 ms
 9 border22.ge2-0-bbnet1.nyc.pnap.net
   (209.191.128.90) 32.982 ms 33.488 ms 33.305 ms
10 spk-2-nyc.dsl-isp.net
   (209.191.132.36) 46.668 ms 40.220 ms 49.675 ms
11 dsl092-097-032-nyc2.dsl.speakeasy.net
   (66.92.97.32)  284.098 ms 153.512 ms 102.816 ms
12 dsl092-112-130.nyc2.dsl.speakeasy.net
   (66.92.112.130) 79.981 ms 132.609 ms 128.692 ms
```

if I am here



is it faster for me to download
from a Mirror here?

or a mirror here?

could physical location vs. network location be determined programatically?

is this merely an academic problem or can it be applicable to the real world?

would something like this help to speed up file transfer times and make optimum use of available bandwidth?

would the Mirror application be appreciated and used by the Macintosh user community?

and a dynamic User-to-Mirror routing mechanism?

THANKS for coming!

(insert your questions here)