

# Introduction to Computer Networks

## Peeking inside the Network with Traceroute



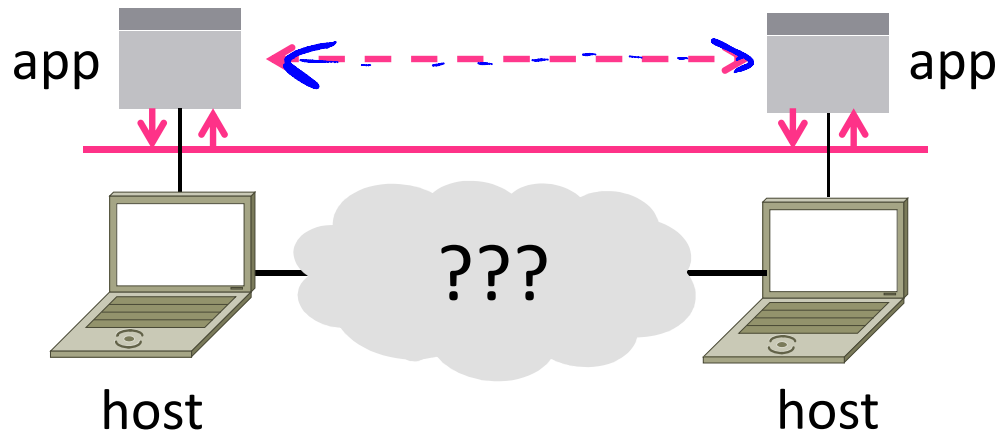
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# Network Service API Hides Details

- Apps talk to other apps with no real idea of what is inside the network
  - This is good! But you may be curious ...

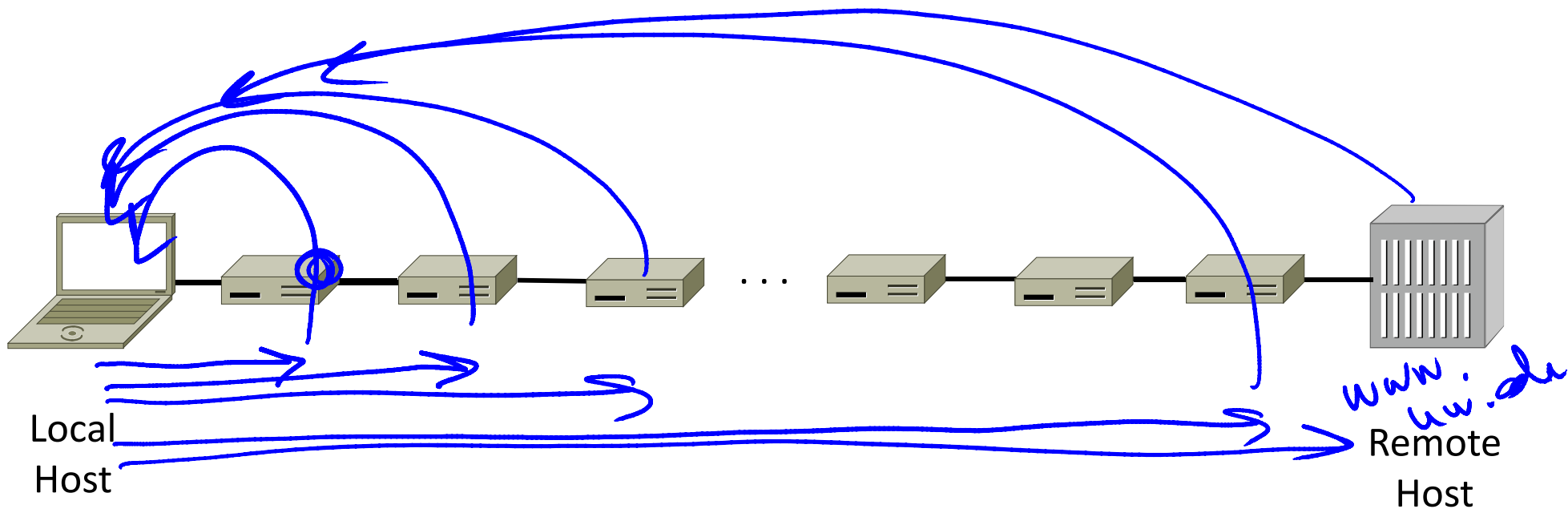


# Traceroute

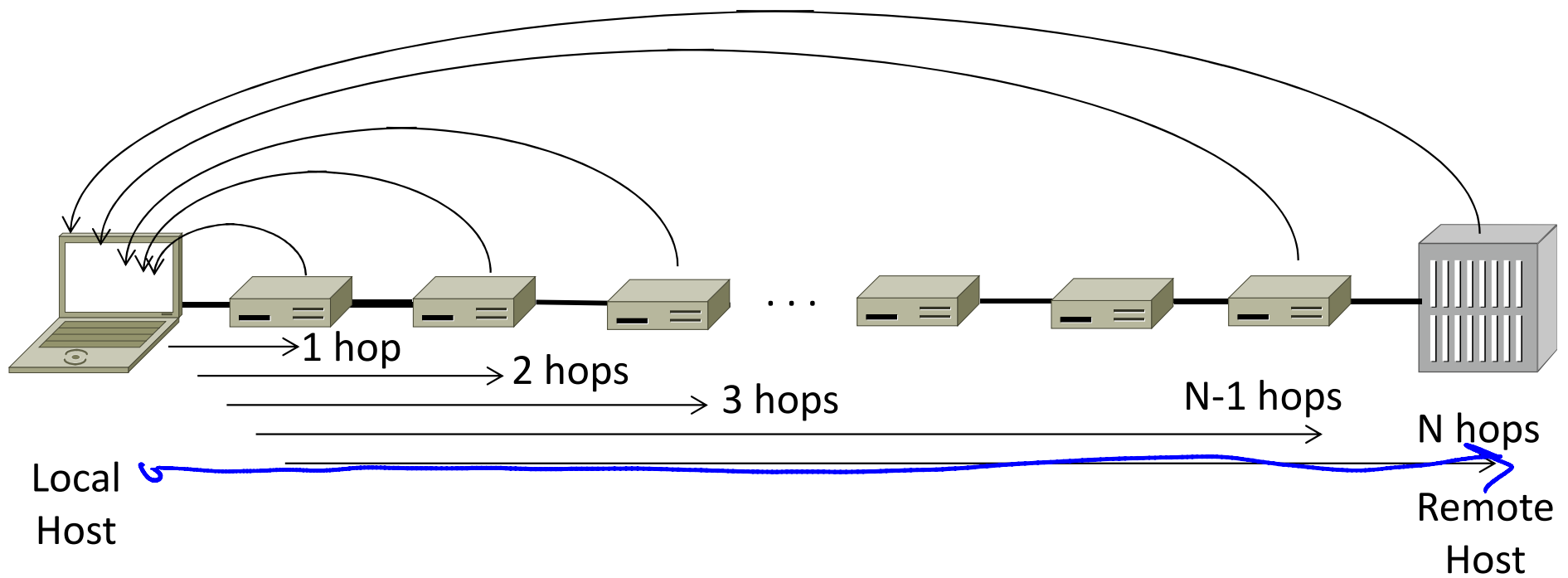
- Widely used command-line tool to let hosts peek inside the network
  - On all OSes (tracert on Windows)
  - Developed by Van Jacobson ~1987
  - Uses a network-network interface (IP) in ways we will explain later

# Traceroute (2)

- Probes successive hops to find network path



# Traceroute (3)



# Using Traceroute

```
Administrator: Command Prompt
C:\Users\djw>tracert www.uw.edu

Tracing route to www.washington.edu [128.95.155.134]
over a maximum of 30 hops:

  0  1 ms  <1 ms  2 ms  192.168.1.1
  1  8 ms   8 ms   9 ms  88.Red-80-58-67.staticIP.rima-tde.net [80.58.67.88]
  2 16 ms   5 ms  11 ms 169.Red-80-58-78.staticIP.rima-tde.net [80.58.78.169]
  3 12 ms  12 ms  13 ms 217.Red-80-58-87.staticIP.rima-tde.net [80.58.87.217]
  4  5 ms  11 ms   6 ms et-1-0-0-1-101-GRIBCNES1.red.telefonica-wholesale.net [94.142.103.201]
  5 40 ms  38 ms  38 ms 176.52.250.226
  6 108 ms 106 ms 136 ms xe-6-0-2-0-grtnycpt2.red.telefonica-wholesale.net [213.140.43.9]
  7 180 ms 179 ms 182 ms Xe9-2-0-0-grtpaopx2.red.telefonica-wholesale.net [94.142.118.178]
  8 178 ms 175 ms 176 ms te-4-2.car1.SanJose2.Level3.net [4.59.0.225]
  9 190 ms 186 ms 187 ms vlan80.csw3.SanJose1.Level3.net [4.69.152.190]
 10 185 ms 185 ms 187 ms ae-82-82.ebr2.SanJose1.Level3.net [4.69.153.25]
 11 268 ms 205 ms 207 ms ae-7-7.ebr1.Seattle1.Level3.net [4.69.132.50]
 12 334 ms 202 ms 195 ms ae-12-51.car2.Seattle1.Level3.net [4.69.147.132]
 13 195 ms 196 ms 195 ms PACIFIC-NOR.car2.Seattle1.Level3.net [4.53.146.142]
 14 197 ms 195 ms 196 ms ae0--4000.iccr-sttlwa01-02.infra.pnw-gigapop.net [209.124.188.132]
 15 196 ms 196 ms 195 ms v14000.uwbr-ads-01.infra.washington.edu [209.124.188.133]
 16 *      *      *      Request timed out.
 17 201 ms 194 ms 196 ms ae4--583.uwar-ads-1.infra.washington.edu [128.95.155.131]
 18 197 ms 196 ms 195 ms www1.cac.washington.edu [128.95.155.134]

Trace complete.
```

# Using Traceroute (2)

- ISP names and places are educated guesses

