Performance of a T3 link

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CS 577 Term Project

Outline

- **Project Goals**
- **Description**
- **Details - What to measure?**
- **Technology - How to measure?**
- **Analysis**
- **Conclusion**

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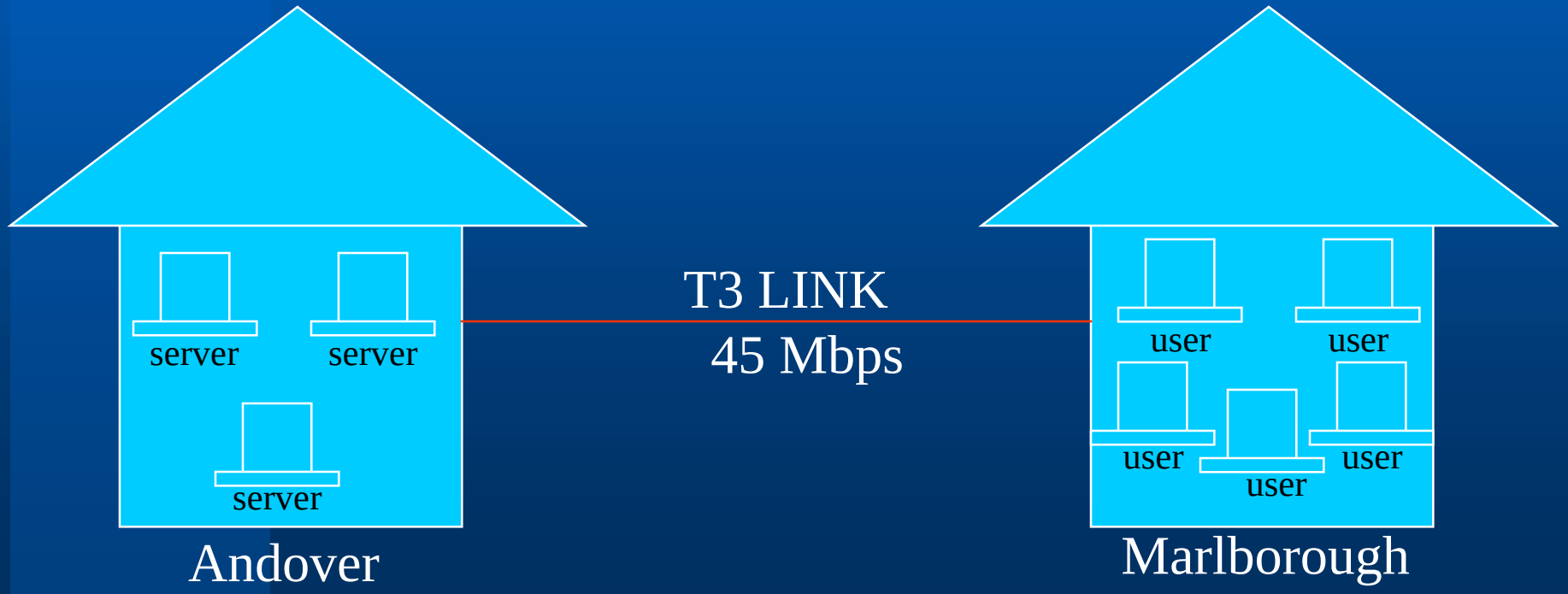
Project Goals

- **To measure utilization of a T3 link between Andover and Marlborough**



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Description

- **Engineers in both locations**
- **Clear Case, Team Track, etc. in Andover**
- **Marlborough employees need to access Clear Case, Team Track, etc.**
- **T3 link (45Mbps) between two locations**
- Do we get the use out of the T3 link?
- Can we justify having a T3 link or T1 would be enough?

T3 - comprised of 28 T1 lines

•A T3 line (also know as a DS-3) is an ultra high-speed connection capable of transmitting data at rates up to 45 Mbps.

•A T3 line is equal to approximately 672 regular voice-grade telephone lines

•Fast enough to transmit full-motion, real-time video, and very large databases over a busy network.

T3 - comprised of 28 T1 lines

- A T3 line is typically installed as a major networking artery for large corporations and universities with high-volume network traffic.

- A T3 is the second fastest, non optical connection offered in North America.

- A T3 line is comprised of 28 T1 lines, each operating at total signaling rate of 1.544 Mbps.

T3 vs T1

•The most significant differences between T1 lines and T3 lines are cost and speed.

•The typical T1 connection costs approximately $800 per month while a T3 connection can cost as much as $15,000 per month.

•T3 lines are extremely high bandwidth connections into a carrier's backbone.

•They typically include SLAs (Service Level Agreements) that guarantee uptime and performance

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What to measure?

- **Utilization** - the % of the pipe being used
- **Throughput** - the amount of information transferred within the system for a given amount of time
- **Latency** - response time
- **Jitter** - variation in delay for packet transfers

- Take spot measurements at different times of day

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How to measure?

Performance Measurement Tools

Network Monitoring Tools

Network Performance and Measurement Tools

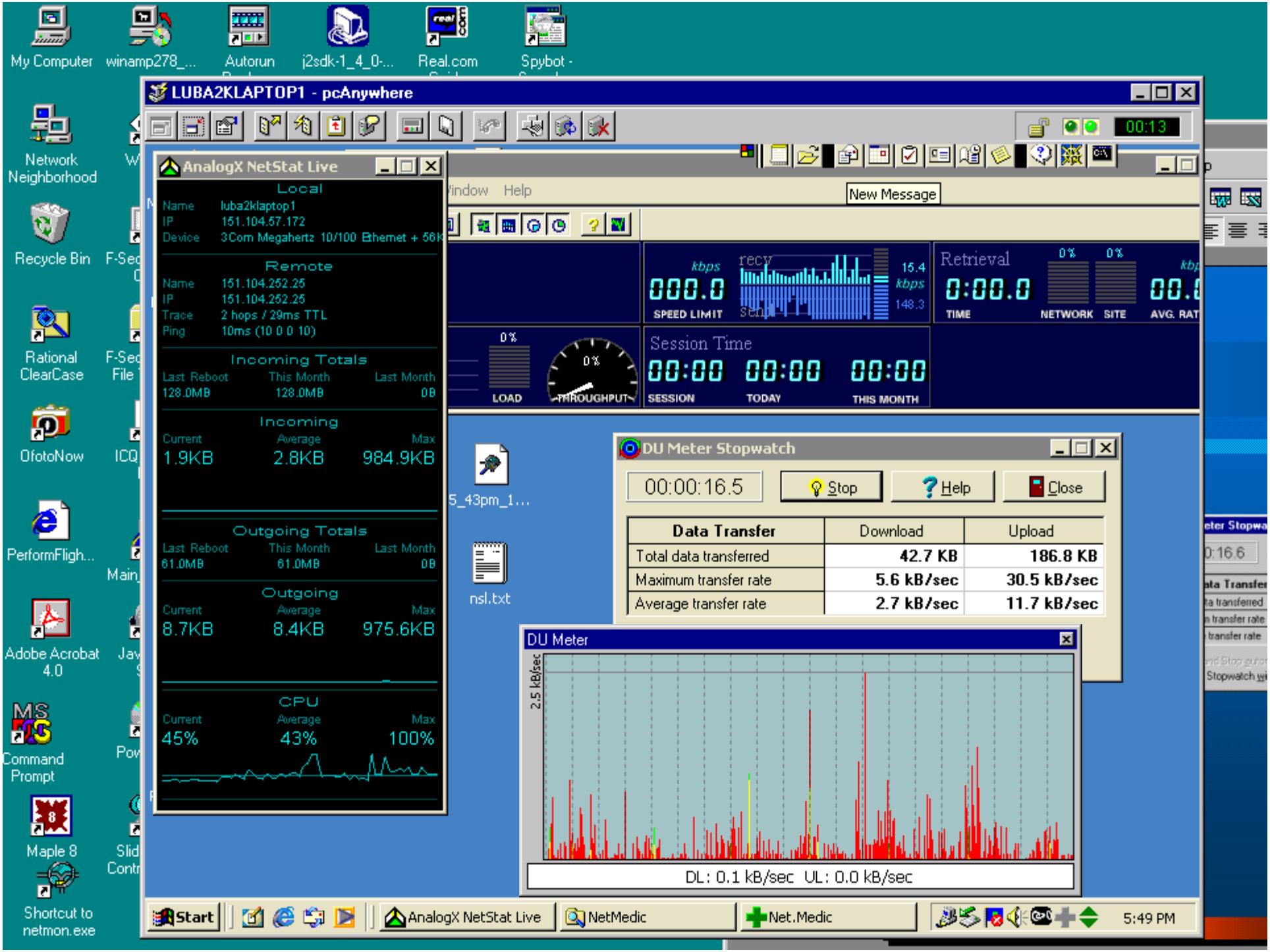
Surveyor

DU Meter

NetStatLive

Net.Medic

MRTG - THE WORST
- HARD TO INSTALL


LUBA2KLAPTOP1 - pcAnywhere
00:13
AnalogX NetStat Live
Local
Name luba2klaptop1
IP 151.104.57.172
Device 3Com Megahertz 10/100 Ethernet + 56k
Remote
Name 151.104.252.25
IP 151.104.252.25
Trace 2 hops / 29ms TTL
Ping 10ms (10 0 0 10)
Incoming Totals
Last Reboot This Month Last Month
128.0MB 128.0MB 0B
Incoming
Current Average Max
1.9KB 2.8KB 984.9KB
Outgoing Totals
Last Reboot This Month Last Month
61.0MB 61.0MB 0B
Outgoing
Current Average Max
8.7KB 8.4KB 975.6KB
CPU
Current Average Max
45% 43% 100%
New Message
kbps
000.0
SPEED LIMIT
recv
15.4 kbps
148.3
Retrieval
0:00.0
TIME
NETWORK
SITE
AVG. RAT
LOAD
THROUGHPUT
Session Time
00:00 00:00 00:00
SESSION TODAY THIS MONTH
DU Meter Stopwatch
00:00:16.5
Stop
Help
Close
Data Transfer Download Upload
Total data transferred 42.7 KB 186.8 KB
Maximum transfer rate 5.6 kB/sec 30.5 kB/sec
Average transfer rate 2.7 kB/sec 11.7 kB/sec
DU Meter
2.5 kB/sec
DL: 0.1 kB/sec UL: 0.0 kB/sec
nsl.txt
Start
AnalogX NetStat Live
NetMedic
Net.Medic
5:49 PM

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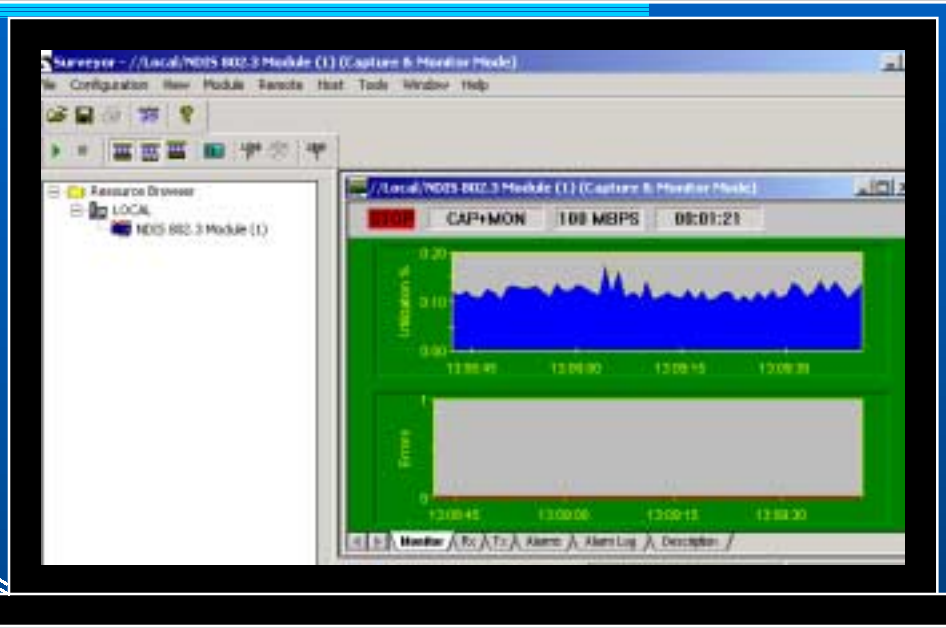
DDM-200 OC-3

Lucent Technologies

T3 LINK

transmitter

receiver



Closet
in
Andover

Coax 3

Path Builder S500 Series 3COM Tunnel Switch

10BaseT/100BaseTX

SuperStackII Switch 3900

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Analysis

- Getting to the T3 link not easy
- Waiting to place a hub instead of the switch
- Approximate result are known

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Conclusion

- **T3 link is only 1.6% utilized**
- **T3 link is justified anyway**