Silence of the Lans

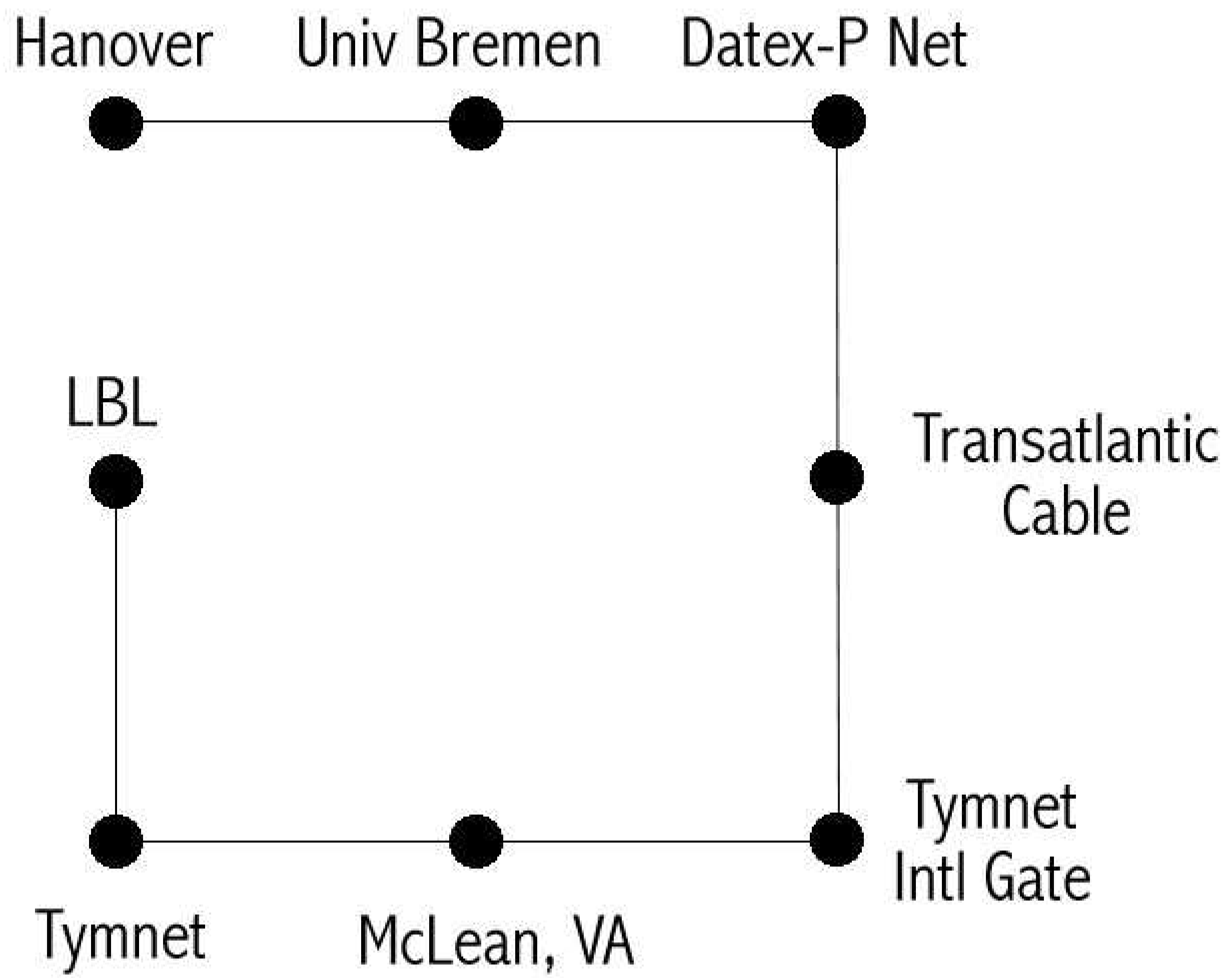
Remote incidents

- Packets traversing network stack
- Remote or local information?
- Very difficult to erase remote network information, very little information kept
- Gathering local network information
- Important nodes on network
- Initial vs. subsequent connections

What we won’t Cover

- DOS - smurf/ping-O-death/winnuke/etc.
- Detection of sniffers

Typical Network Attack



Eradicating Network Traces

- Virtually impossible in most cases
- Don’t know where data was saved
- Must determine where data flow went
- Compromise all routers, hosts, etc.
- Destroy all information there, plus recursively follow this list

Gathering Information

- System configuration
- System & user programs
- System & kernel memory
- Raw mem/disk - anything with IP #'s/hostnames

System Configuration (1/2)

- Enter into the realm of auditing
- Invisible changes
- Freezing system should *gather* most of this
- Need to know how system **should** look like
- Kernel
- Packet filters

System Configuration (2/2)

- Access control (**`hosts.allow`**, **`httpd.conf`**, **`sshd_config`**, etc.)
- Trust (servers, **`rhosts`**, network info, etc.)
- Configs (routes, **`inetd.conf`**, startup files, etc.)
- Protocols
- Userland (**`.rhosts`**, **`.forward`**, etc.)

Programs

- Queries to system
- Program memory
- Logs

Queries to the System

- **`netstat(8c)`**
- **`arp(8c)`**
- lsof
- portscanners

`Netstat` - Show Net Status

`% netstat -a -f inet`

Active Internet connections (including servers)

Proto	R-Q	S-Q	Local Address	Foreign Address	state
tcp	0	0	flying.smtp	192.215.43.108.4778	EST
tcp	0	0	flying.http	dialup6929.nssl..2787	EST
tcp	0	0	flying.smtp	192.215.43.108.4769	WAIT
tcp	0	0	flying.http	telapex..2198	SYN_RCVD

`Netstat`, etc.

`% netstat -rn`

Routing tables

Destination	Gateway	Flags	Refcnt	Use	Interface
127.0.0.1	127.0.0.1	UH	1	1365	lo0
default	209.179.181.129	UG	17	2089112	le0

`arp` - Address Resolution Display and Control

- What ethernet is claiming IP address
- Only useful on LAN
- Easy to forge
- Can give system types

arpwatch - Craig Leres - *ftp://ftp.ee.lbl.gov/*

Portscanners

- **`% tcp_scan fish.com 1-1024`**

21: ftp

23: telnet

25: smtp

53:domain

515: printer

667: UNKNOWN

Logs

- Syslog
- NFS
- NIS
- DNS
- Kernel

Every Scrap of Data - **`bind`**

- Keeps track of **EVERY** query of host
- Send a **`SIGINT`** signal to **`bind`**
- Dumps database into **`named_dump.db`**
- Compare vs. system logs, known hosts, use TTL vs. time left in memory
- A few megabytes of fun…
- 10^4 << 10^8!

More Scraps…

- Use **`pcat`** to dump a processes memory
- If program (esp. auth daemons) talks to net, possibly has net info
- Even if doesn’t log, it remembers!
- Good for system, great vs.intruder tools
- Easy to spot hosts
- Only reasonable way to prevent is to kill daemon, restart (might see PID change)

Using pcat to Examine Memory

- **ps/lsof** locates program (**nfsd**, **statd**, etc.)

```
# pcat 123 | strings > 123.mem
```

- **grep** '[host/IP pattern]' **123.mem**
- **strings** & **less** to further examine

(Also **/dev/mem** & **/dev/kmem)**

Gathering Remote Information

- Speed is important!
- Hosts - recursively freeze each
- Routers & Access equipment
- Telcos
- ISPs
- FIRST/CERTs, etc.

Routers, etc.

- As complicated as hosts… and less documented & understood
- Can seriously impact investigation
- Lots of ways to manage & examine
- All do things differently
- Should look at:
  - Routes
  - Arp/IP/etc tables
  - Any network information