Scala Network Simulator
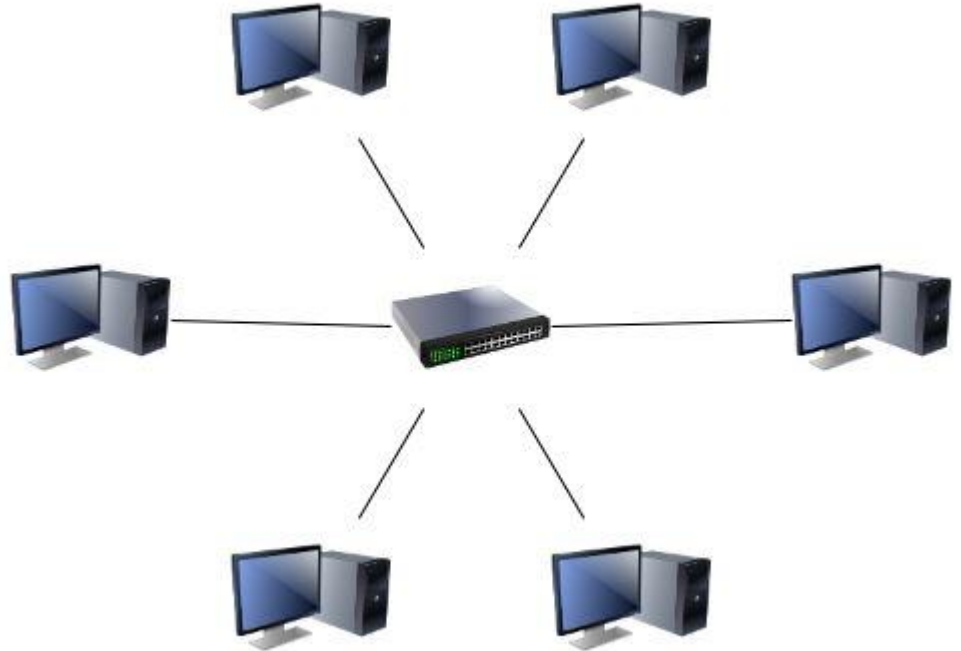
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Intro

- What is networking?

OBJECTIVE

- Learn networking
- Test different network configurations

Key Concepts

- Switches
- Routers
- PCs
- Ports
- Links

```
1  Switch name "sw1";
2      port num 3 uses "Fiber";
3      port num 4 uses "Fiber";
4      port num 5 uses "Ethernet";
5
6  Switch name "sw2"
7      port num 10 uses "Ethernet";
8      port num 11 uses "Fiber";
9      port num 12 uses "Ethernet";
10
11
```

```
1  Router name "r1";
2      port num 6 uses "Fiber" IPAddress "192.168.0.1";
3      port num 7 uses "Fiber" IPAddress "10.10.10.1";
4
5  Router name "r2";
6      port num 8 uses "Fiber" IPAddress "10.10.10.2";
7      port num 9 uses "Fiber" IPAddress "44.44.44.1";
8
9
```

Key Concepts

- Switches
- Routers
- PCs
- Ports
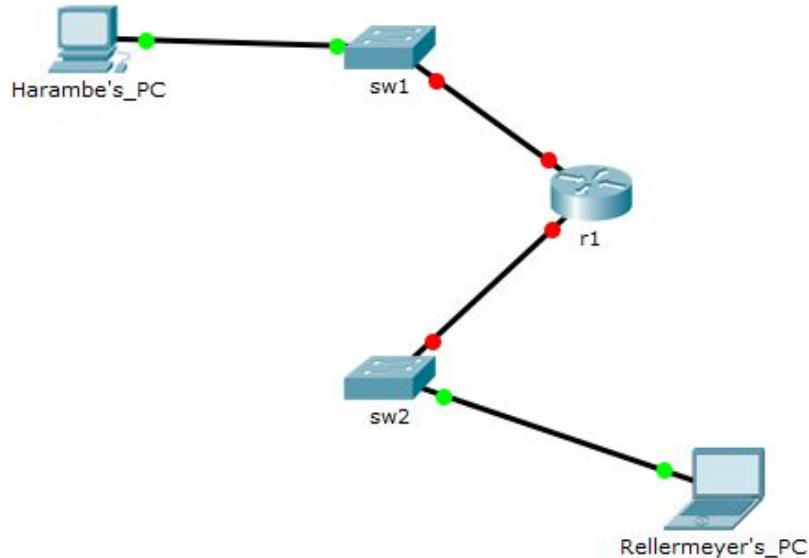- Links

```
1    PC name "Bob's_PC";
2        port num 1 uses "Fiber" IPAddress "192.168.0.36";
3        default gateway "255.255.255.0";
4
5    PC name "Joe's_PC";
6        port num 2 uses "Fiber" IPAddress "192.168.0.21";
7        default gateway "102.168.3.0";
8
9    PC name "Smith's_PC";
10       port num 13 uses "Fiber" IPAddress "44.44.44.8";
11       default gateway "102.185.3.0";
12
```

```
1▼  Links;
2       connect deviceA "sw1" portA 3 deviceB "Bob"'s_PC" portB 1;
3       connect deviceA "sw1" portA 4 deviceB "Joe's_PC" portB 2;
4       connect deviceA "sw1" portA 5 deviceB "r1" portB 6;
5       connect deviceA "r1" portA 7 deviceB "r2" portB 8;
6       connect deviceA "r2" portA 9 deviceB "sw2" portB 10;
7       connect deviceA "sw2" portA 11 deviceB "Smith's_PC" portB 13;
8       connect deviceA "sw2" portA 12 deviceB "Guest's_PC" portB 14;
9
```
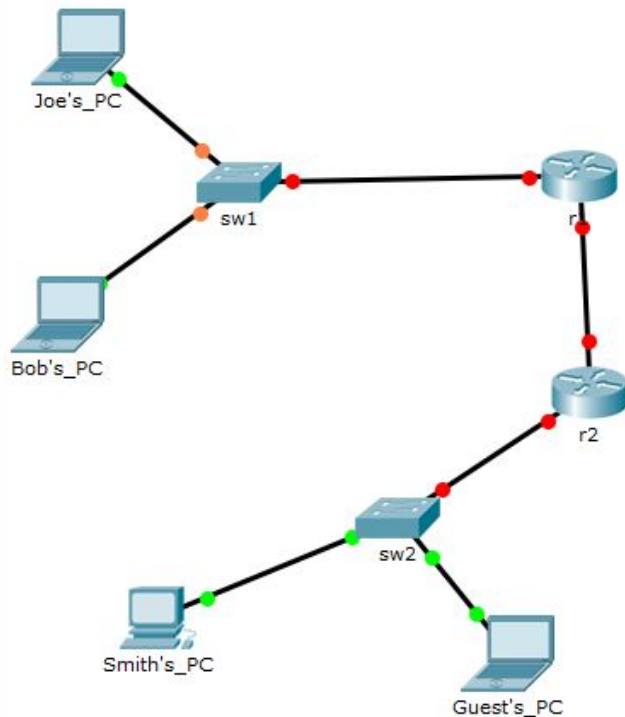
Commands

- send <IP Address> <option> <data>
- changeDevice <device name>
- ping <IP Address>
- traceroute <IP Address>
- inspect <table>

Examples


```
6
7    Switch name "sw1";
8       port num 3 uses "Fiber";
9       port num 4 uses "Fiber";
10      port num 5 uses "Fiber";
11
12   Switch name "sw2"
13      port num 10 uses "Fiber";
14      port num 11 uses "Fiber";
15      port num 12 uses "Fiber";
16
17   Router name "r1";
18      port num 6 uses "Fiber" IPAddress "192.168.0.1";
19      port num 7 uses "Fiber" IPAddress "10.10.10.1";
20
21   PC name "Harambe's_PC";
22      port num 1 uses "Fiber" IPAddress "192.168.0.36";
23      default gateway "123.55.3.0";
24
25   PC name "Rellermeyer's_PC";
26      port num 2 uses "Fiber" IPAddress "192.168.0.21";
27      default gateway "184.22.555.0";
28
29   Links;
30      connect deviceA "sw1" portA 3 deviceB "Harambe's_PC" portB 1;
31      connect deviceA "sw2" portA 10 deviceB "Rellermeyer's_PC" portB 2;
32      connect deviceA "sw1" portA 5 deviceB "r1" portB 6;
33      connect deviceA "r1" portA 9 deviceB "sw2" portB 10;
34
35   Config Network;
```

Examples


```
13    port num 10 uses "Fiber";
14    port num 11 uses "Fiber";
15    port num 12 uses "Fiber";
16
17  Router name "r1";
18    port num 6 uses "Fiber" IPAddress "192.168.0.1";
19    port num 7 uses "Fiber" IPAddress "10.10.10.1";
20
21  Router name "r2";
22    port num 8 uses "Fiber" IPAddress "10.10.10.2";
23    port num 9 uses "Fiber" IPAddress "44.44.44.1";
24
25  PC name "Bob's_PC";
26    port num 1 uses "Fiber" IPAddress "192.168.0.36";
27    default gateway "";
28
29  PC name "Joe's_PC";
30    port num 2 uses "Fiber" IPAddress "192.168.0.21";
31    default gateway "";
32
33  PC name "Smith's_PC";
34    port num 13 uses "Fiber" IPAddress "44.44.44.8";
35    default gateway "";
36
37  PC name "Guest's_PC";
38    port num 14 uses "Fiber" IPAddress "44.44.44.3";
39    default gateway "";
40
41  Links;
42    connect deviceA "sw1" portA 3 deviceB "Bob's_PC" portB 1;
43    connect deviceA "sw1" portA 4 deviceB "Joe's_PC" portB 2;
44    connect deviceA "sw1" portA 5 deviceB "r1" portB 6;
45    connect deviceA "r1" portA 7 deviceB "r2" portB 8;
46    connect deviceA "r2" portA 9 deviceB "sw2" portB 10;
47    connect deviceA "sw2" portA 11 deviceB "Smith's_PC" portB 13;
48    connect deviceA "sw2" portA 12 deviceB "Guest's_PC" portB 14;
49
50  Config Network;
51
```

Demo

Improvements

- GUI interface
- Provide more commands
- Customizability
- More messages for user

Questions