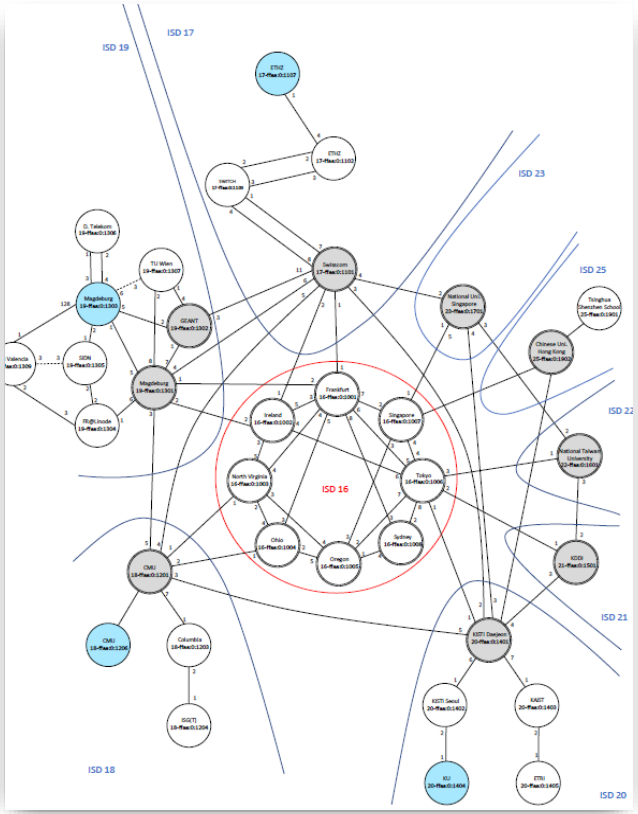
SCION: Heir to the throne ♛

A next-generation **MOBA**

MOBA: Multiplayer Online ~~Battle Arena~~

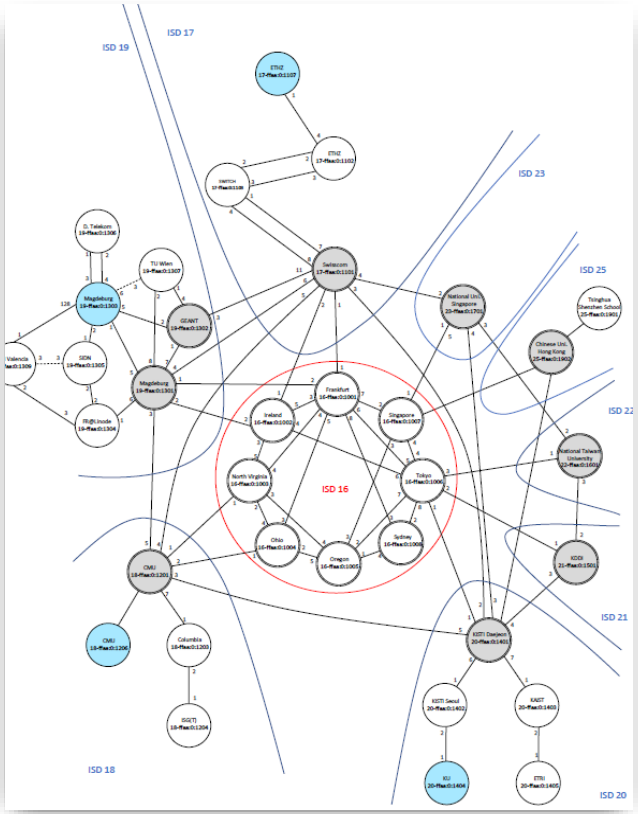
BANDWIDTH ATTACK !!

- Play on the **real SCIONLab network**
- Control endpoints on this topology
- Create a **sender** application to transfer data

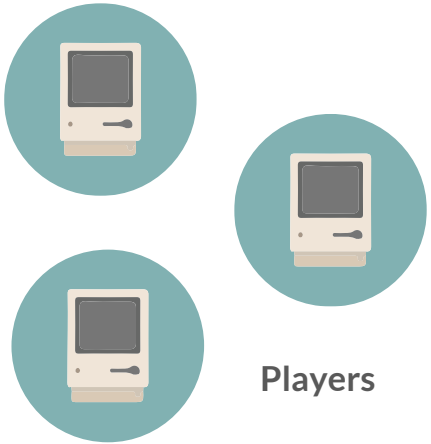


Aim of the Game

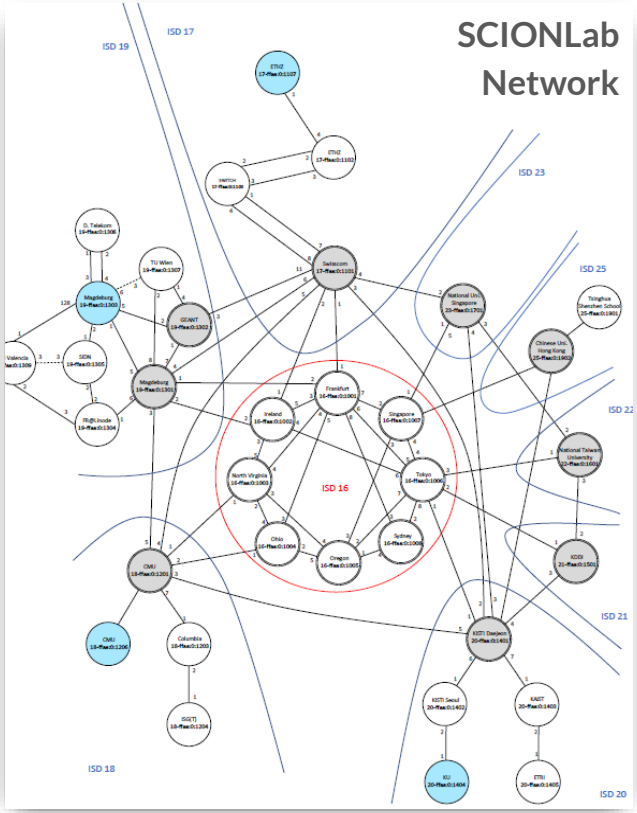
- Create an application that delivers as much data as possible over the network.
- The application will run on a source server…
- … and will send data to pre-defined sink server
- Later who selects sources, sinks etc…



“How to play”



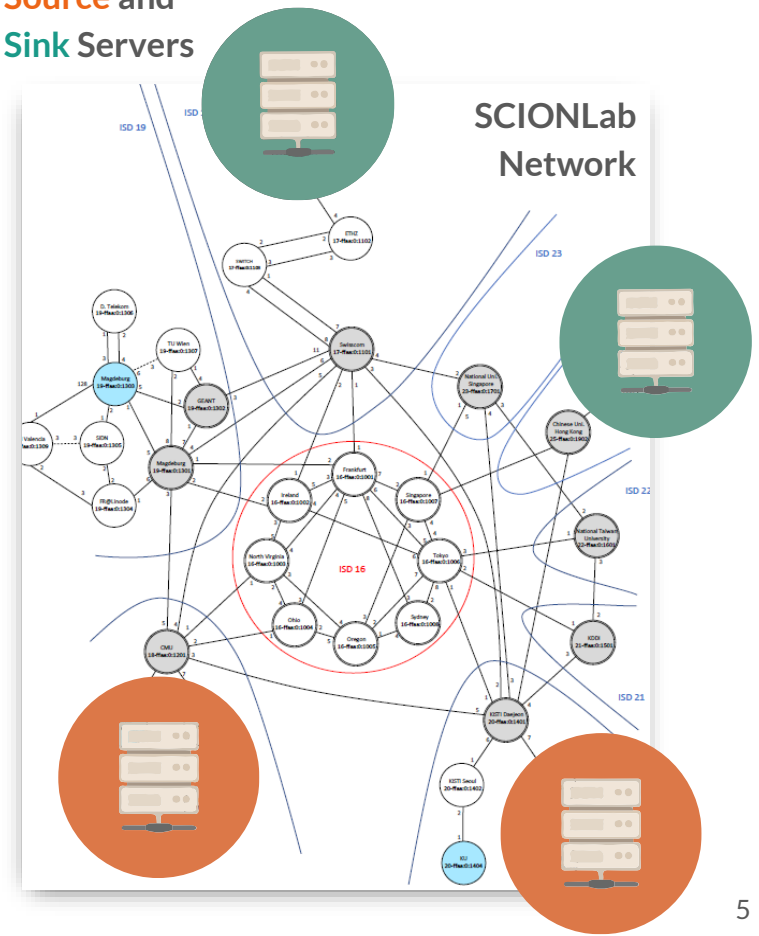
Players



“How to play”

Players

Source and
Sink Servers



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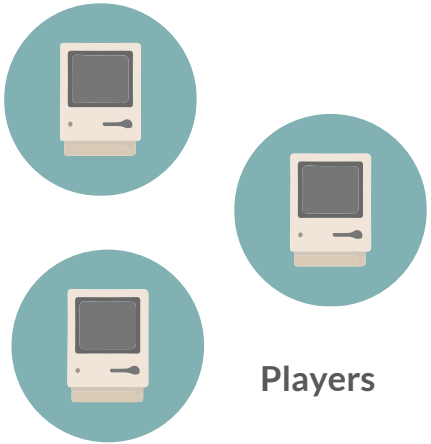
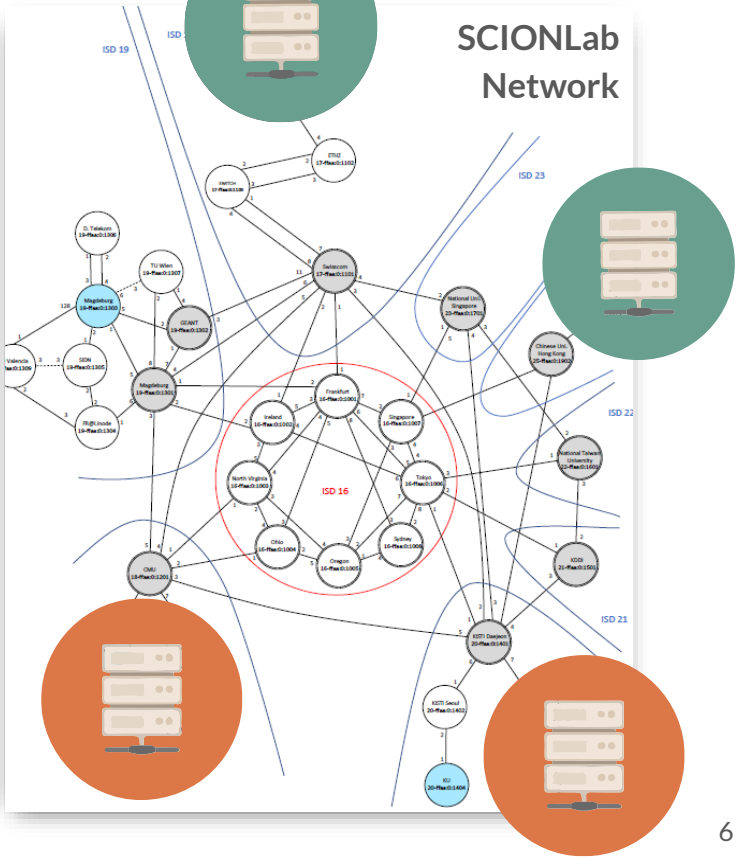


Players

Web Server

Source and
Sink Servers



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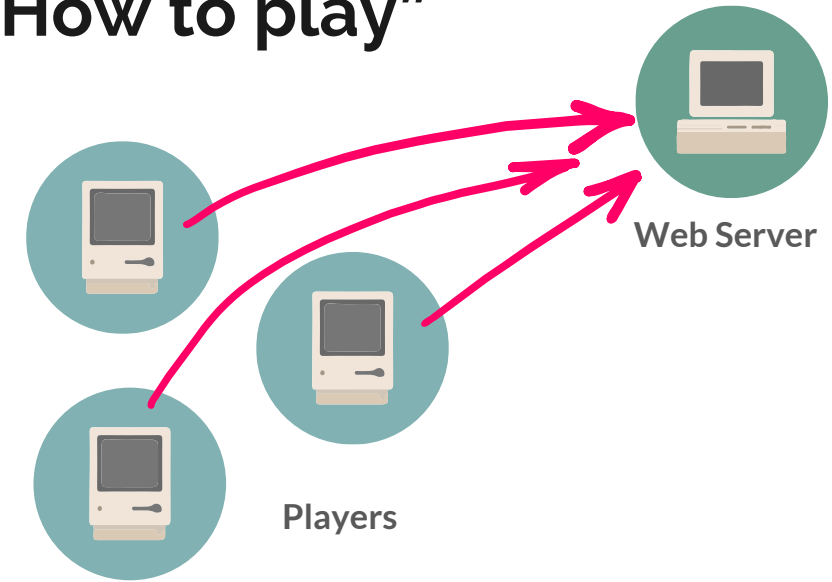
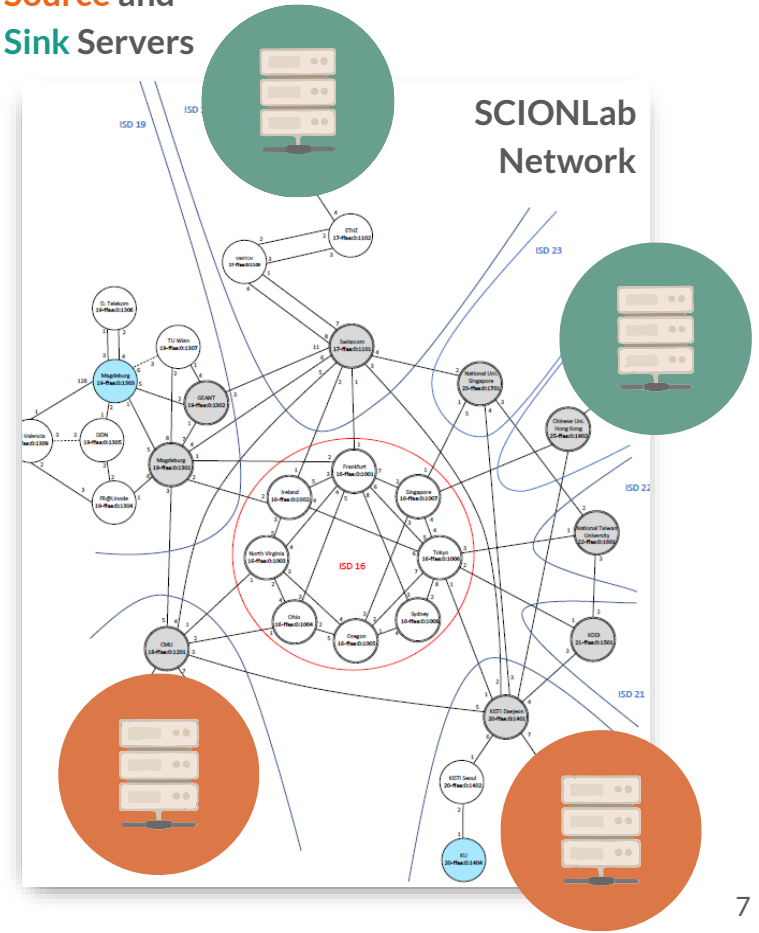


Source and
Sink Servers



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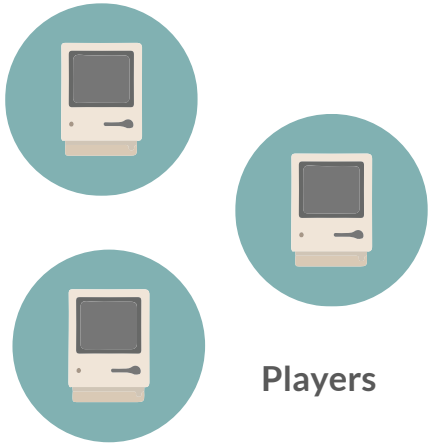
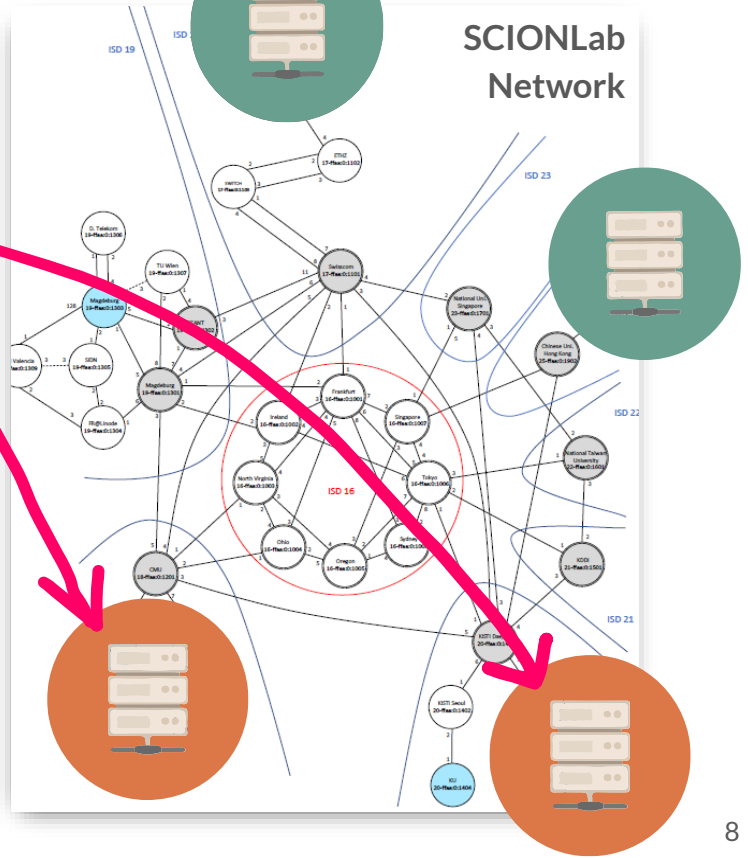


Players

Source and
Sink Servers

Web Server



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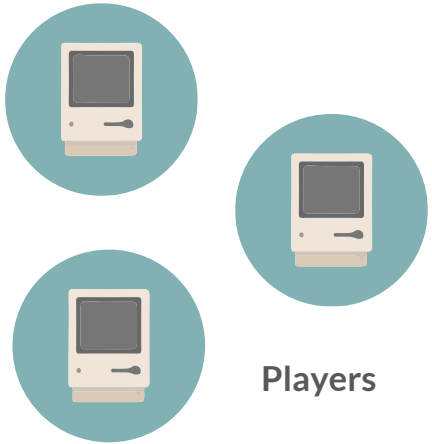
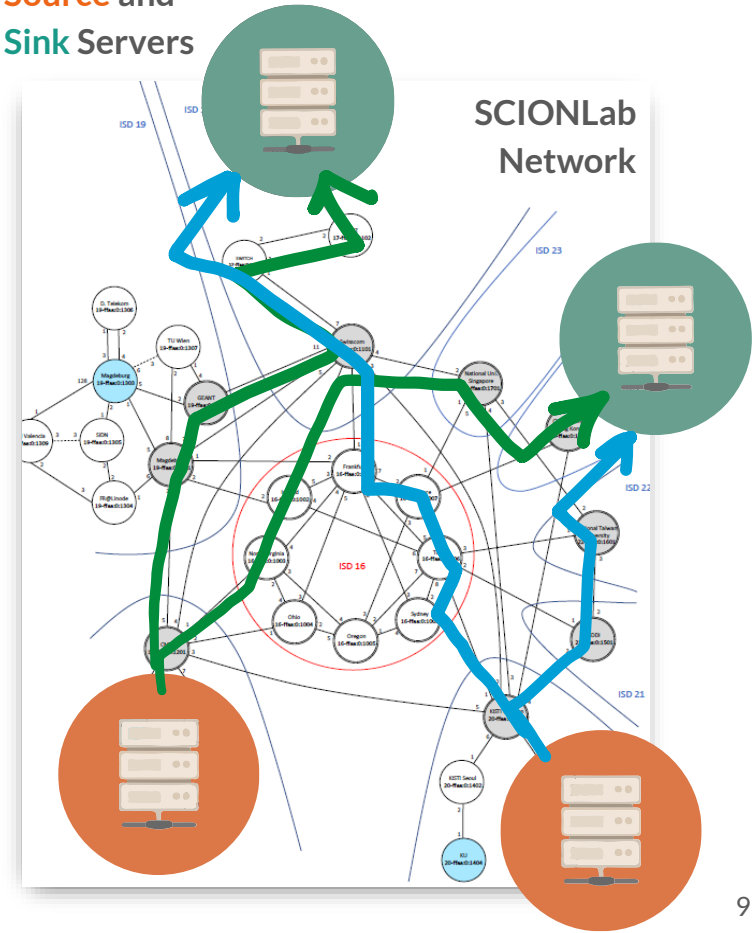


Players

Web Server

Source and
Sink Servers



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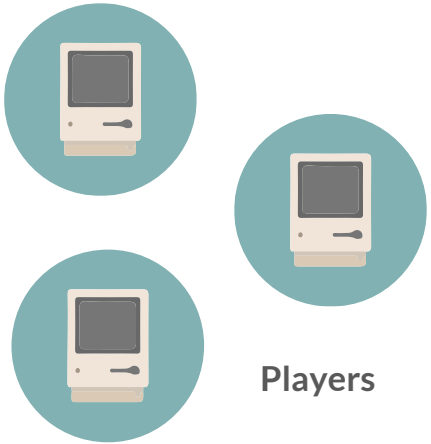
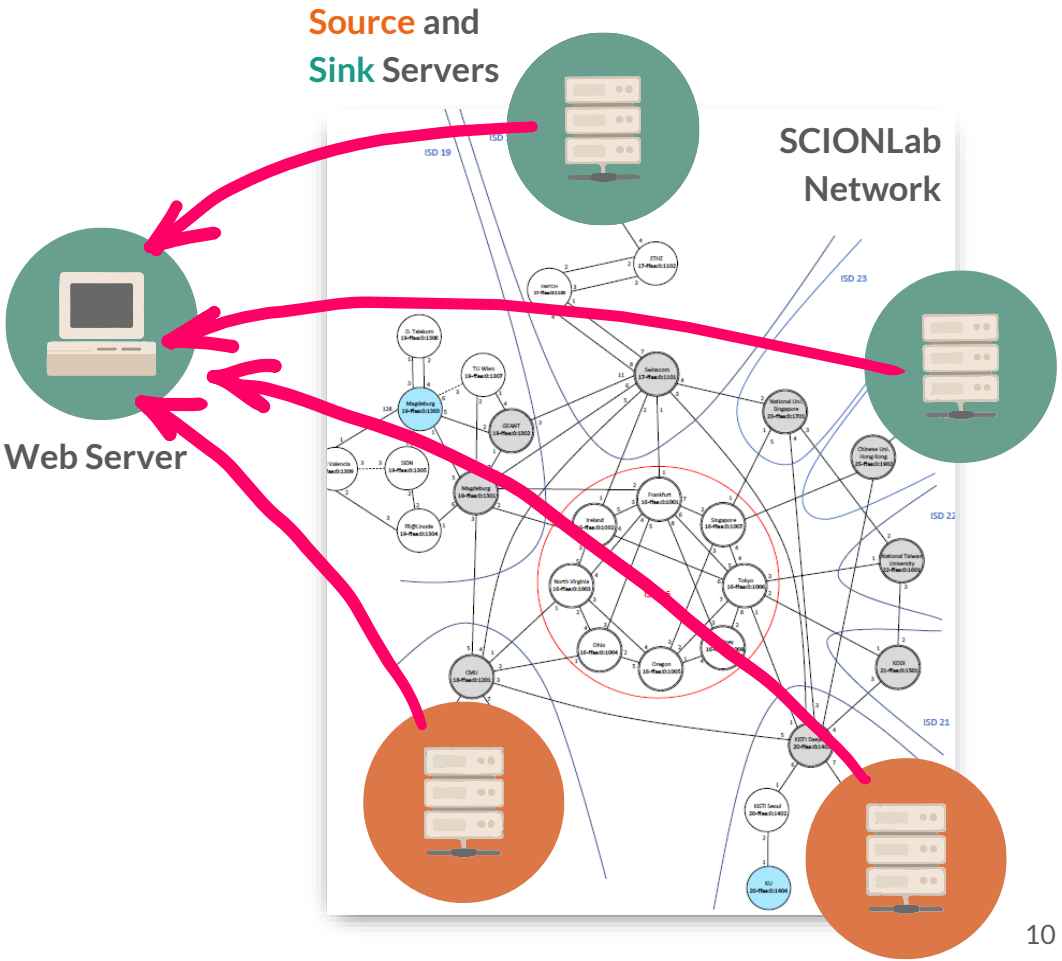
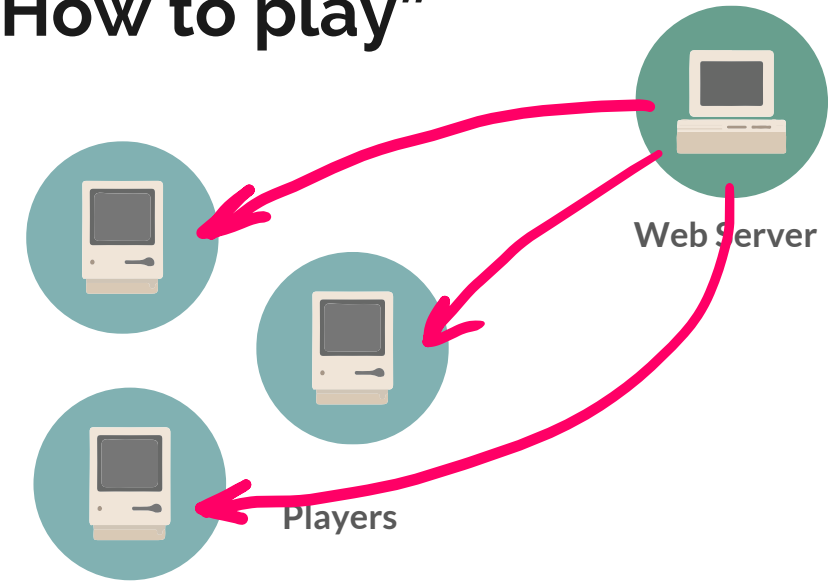
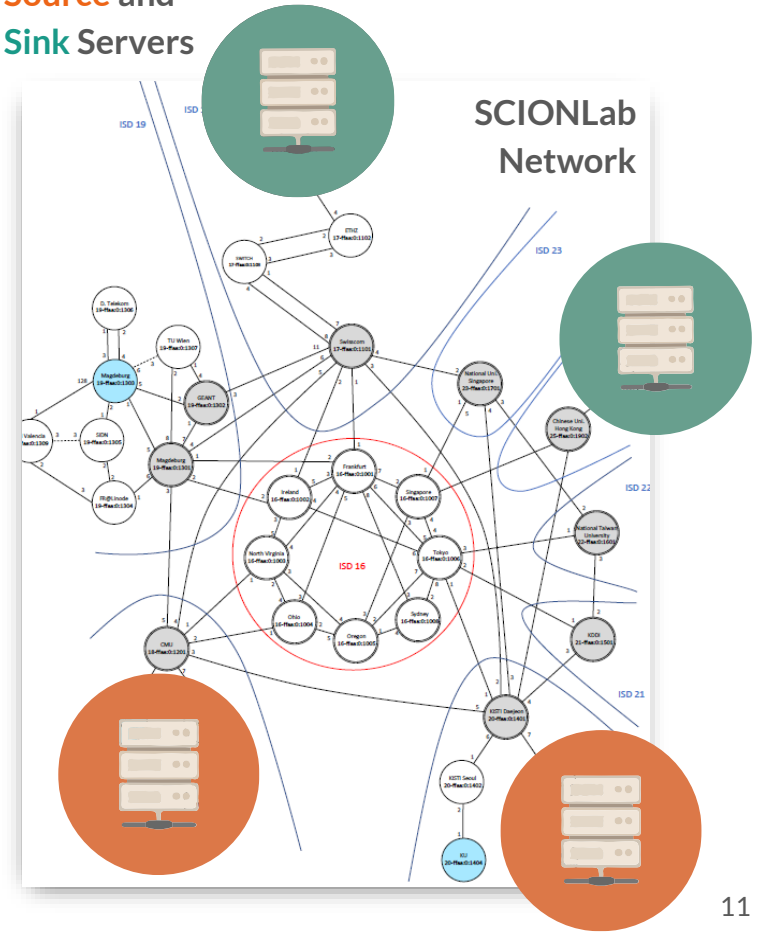

Players


Source and
Sink Servers
SCIONLab
Network
Web Server

“How to play”



Source and
Sink Servers



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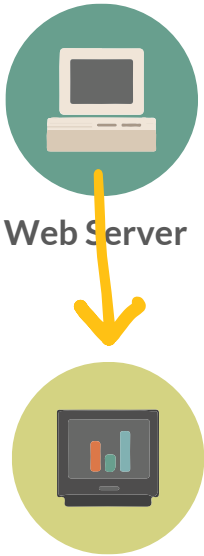
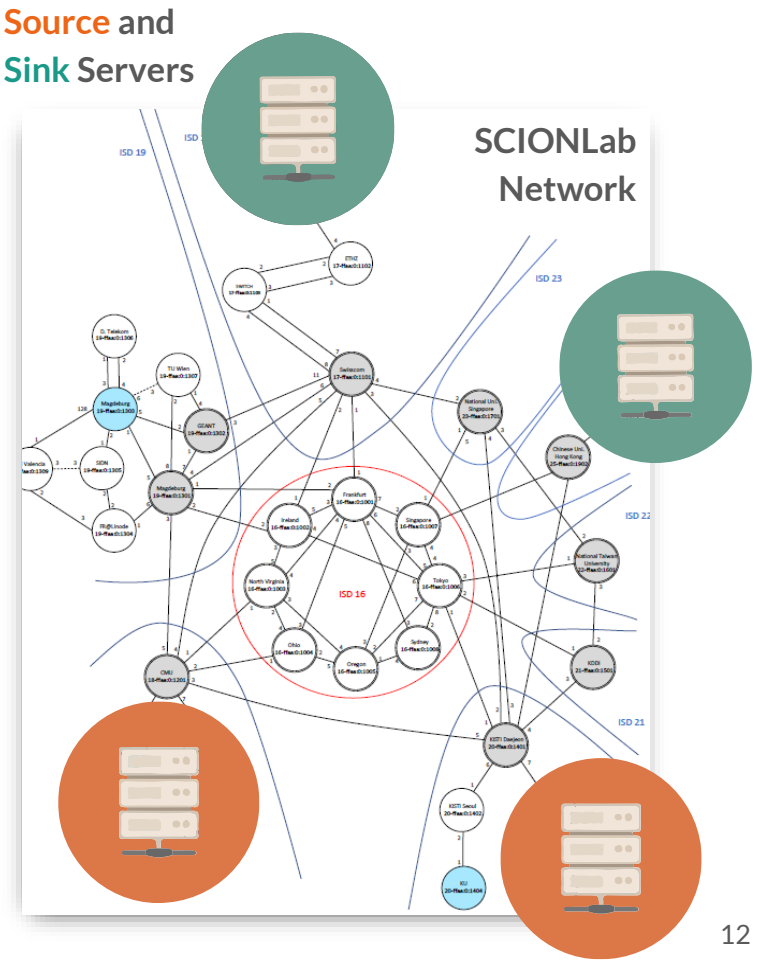
Players



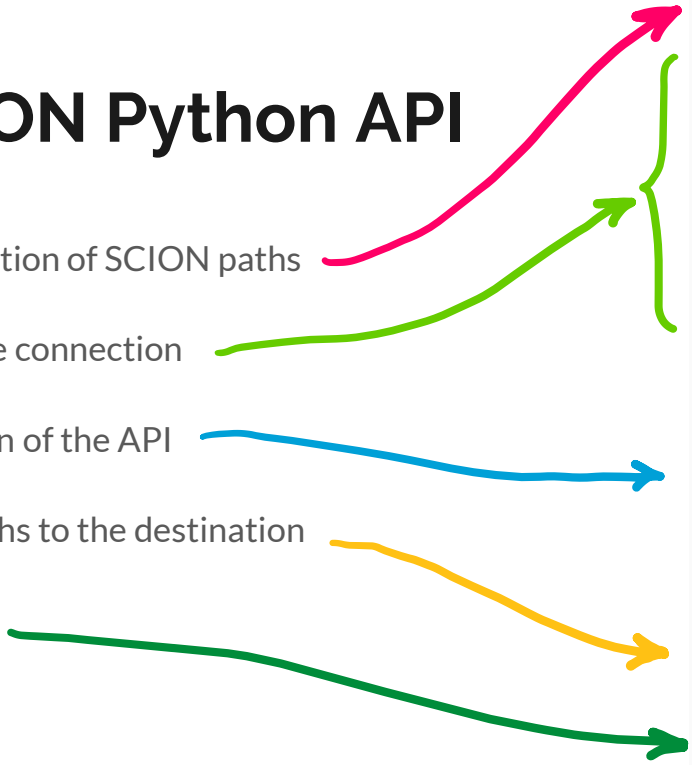


Game Rounds

- The game happens in rounds, one every **90** seconds
- In every round, the latest version is run from the source for **30** seconds
- At the end of the round, the number of transferred bytes is collected and the score is computed
- **1 source** and **3 sinks** are computed randomly at each round
- **10 rounds** are for **“testing”**, **10 rounds** count towards the **final score**!

The SCION Python API

- Representation of SCION paths
- Socket-type connection
- Initialization of the API
- Getting paths to the destination
- Listening



```python
class Path:
    ...

class connect:
    def __init__(self, destination, path):
        ...
    def write(self, buffer):
        ...
    def read(self, buffer):
        ...
    def close(self):
        ...

def set_log_level(level):
    ...

def init():
    ...

def local_address():
    return '1-ffaa:0:0,[127.0.0.1]'

def paths(destination):
    return [Path(), Path()]

def listen(port):
    return connect(None, None)
```

Example code 1

```
9  def main():
10     sci.init()
11     print('Local Address is {}'.format(sci.local_address()))
12     for dest_addr, nbytes in parse_tasks_from_stdin():
13         destination = "{}:12345".format(dest_addr) # send to port 12345
14         print(' === TASK to destination {} : {}MB ==='.format(destination, int(nbytes/1024/1024)))
15         paths = really_get_paths(destination)
16         print('Got %d paths' % len(paths))
17         with sci.connect(destination, paths[0]) as fd:
18             for i in range(int(nbytes / 1000)+1):
19                 fd.write(MTU*b'a')
```

Example code 2

```
22  def really_get_paths(destination):
23      # getting paths is async, so let's just retry until we get some
24      while True:
25          try:
26              return sci.paths(destination)
27          except sci.SCIONException:
28              time.sleep(0.1)
29
30
31  def parse_tasks_from_stdin():
32      def parse_line(line):
33          dest, nbytes = line.split()
34          return dest, int(nbytes)
35      return [parse_line(line) for line in sys.stdin]
```

Getting creative!

- Use multiple paths to the same destination
- Multithreading
- DoS the paths of your adversaries
- … you name it!

SCION
you select path
explicit trust
✓
no convergence
✓
✗

Signing up, submitting, getting the logs

REMEMBER TO `$ export TEAM_TOKEN=<token>`

Signup your team	`./scionlab.sh signup TEAMNAME`
Submit new code	`./scionlab.sh submit FILENAME`
Get the latest logs	`./scionlab.sh log`