

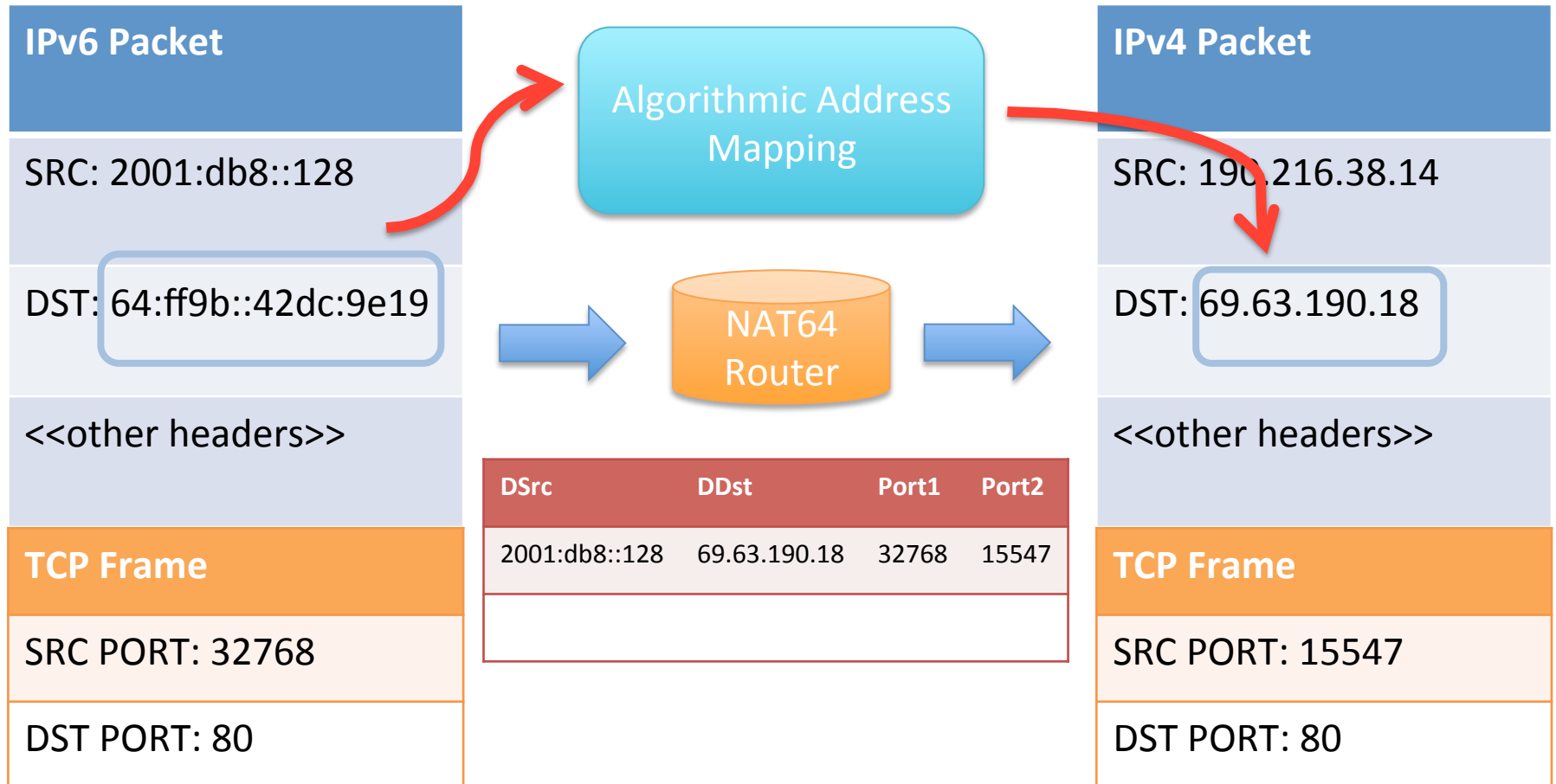
An experiment with stateless NAT64

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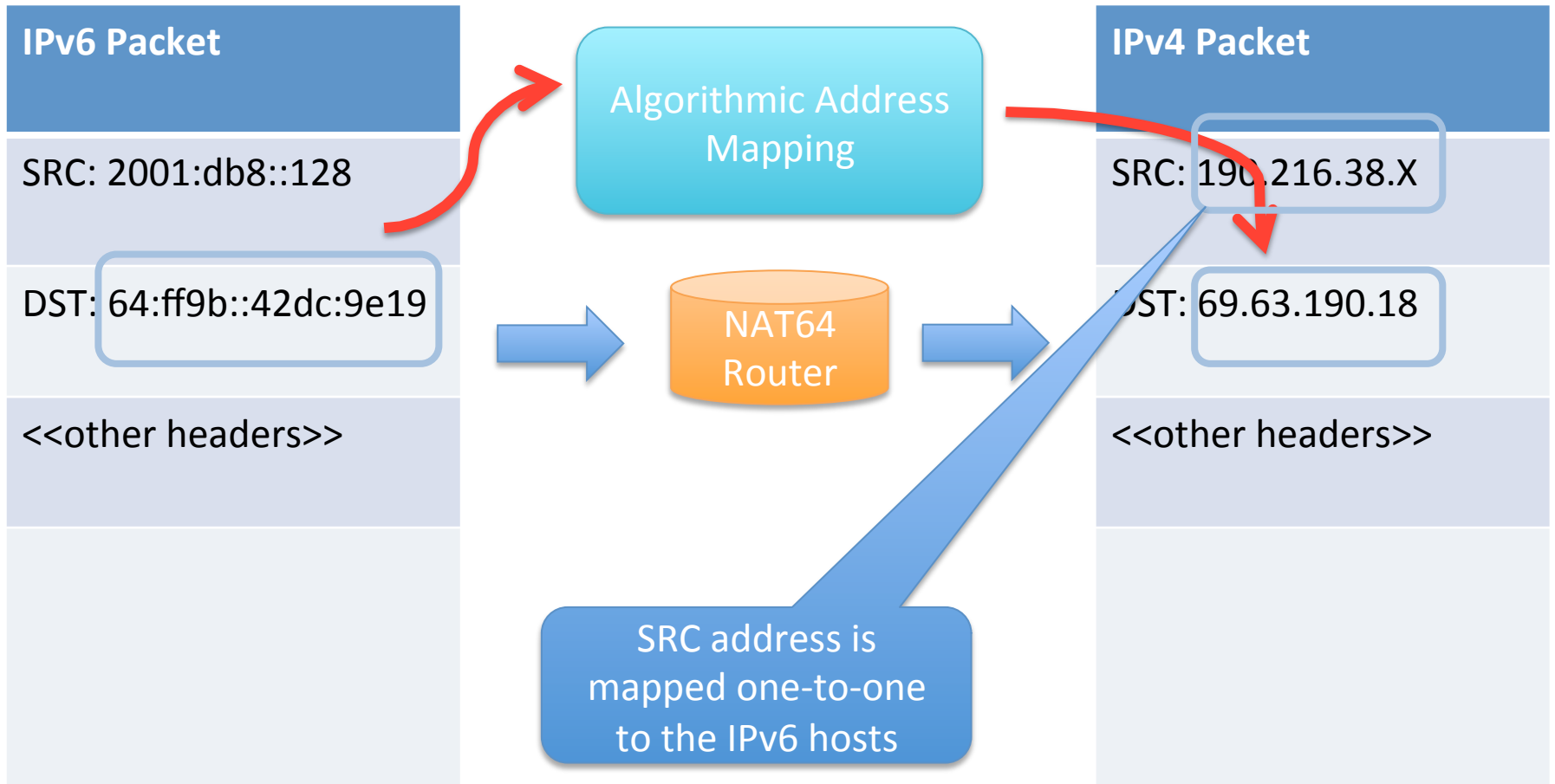
NAT64

- We all know what it is...
 - Connect IPv6-only clouds with IPv4-only clouds
 - Translate protocol headers including addresses
 - Source IPv4 address for translated packet
 - Multiplexed using TCP / UDP port numbers: Stateful NAT64
 - One-to-one mapping: Stateless NAT64
 - Destination IPv4 address is embedded / encoded in IPv6 destination address

Stateful NAT64



Stateless NAT64



Introducing TAYGA

- TAYGA is a user-mode, stateless NAT64 implementation
 - Uses the TUN driver
- Mapping between IPv6 hosts and IPv4 hosts is one-to-one
 - You need to have as many IPv4 addresses as hosts you want to have
- <http://www.litech.org/tayga/>

Configuring TAYGA

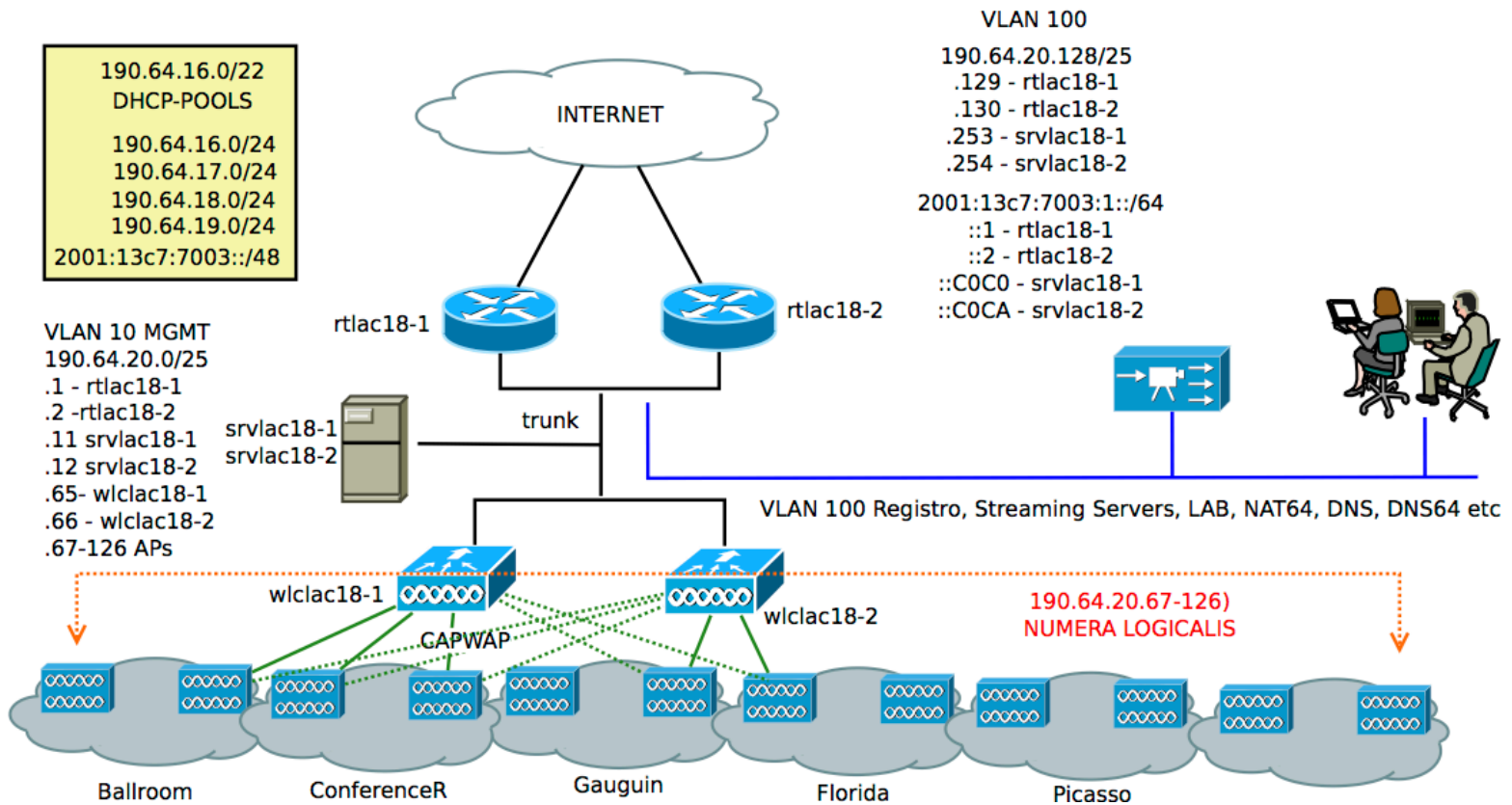
- {Taken from TAYGA's website}
- Compile:
 - The usual `./configure && make && make install`
- Create `/usr/local/etc/tayga.conf`:

```
tun-device nat64
ipv4-addr 192.168.255.1
prefix 64:ff9b::/96
dynamic-pool 192.168.255.0/24
data-dir /var/db/tayga
```
- Create tun device and configure static routes and addresses

The Experiment

- LACNIC 18, Montevideo, Uruguay in October 2012
- 350 attendees, ~550 devices
- Multiple SSIDs
 - Dual-Stack, IPv6-Only+NAT64

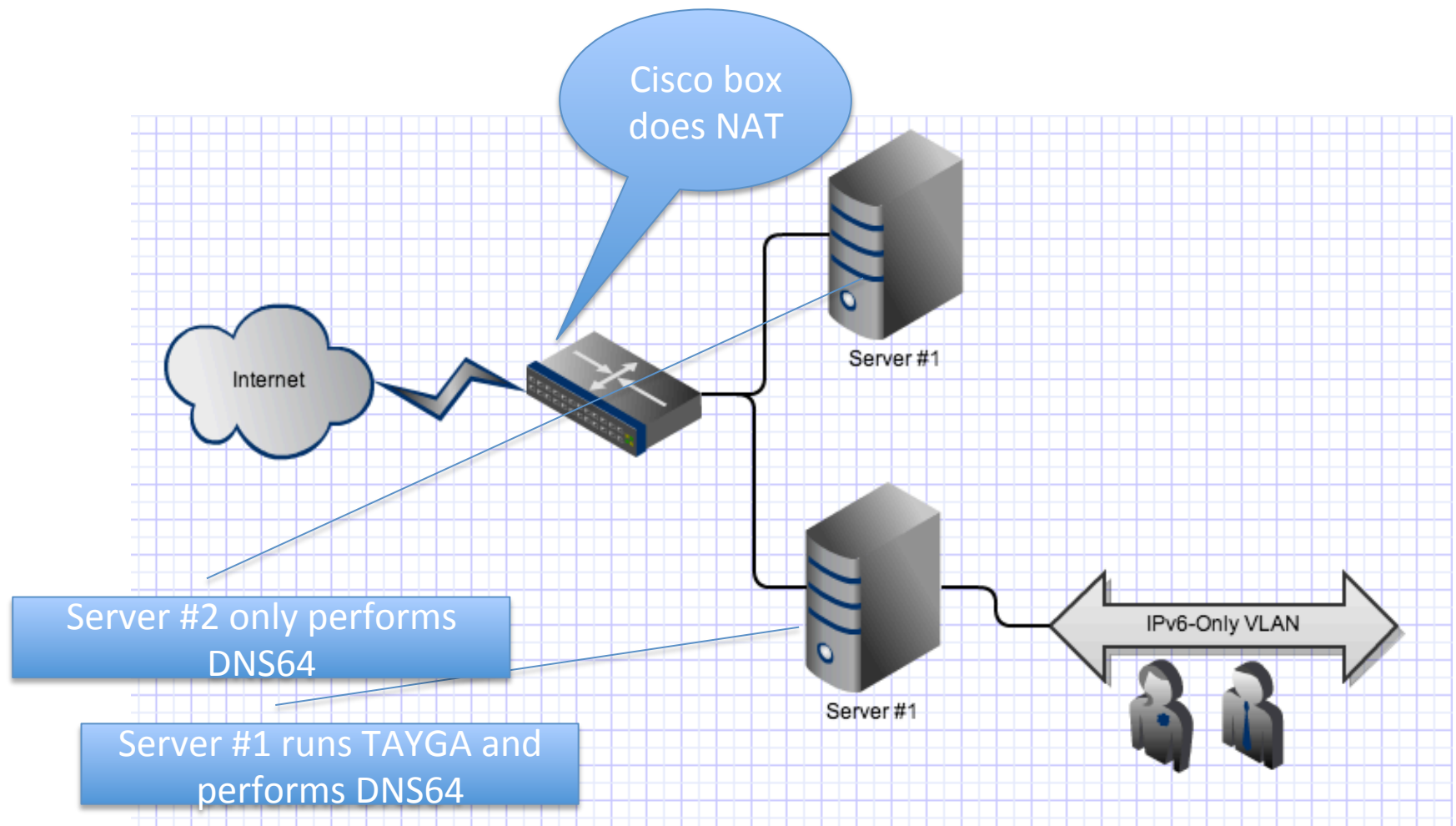
The Network



Network Setup

- NAT64 to a private IPv4 pool
- Stateful NAT44 configured in the Cisco boxes
 - Could have used the servers themselves with *iptables -j MASQUERADE*

Network Setup (ii)



DNS64

- Implemented with BIND 9.8
- DNS64 synthetic answers restricted to the IPv6-only VLAN
- Very simple configuration:

```
dns64 64:ff9b::/96 {  
    clients <lacnic18pfx>:b0b0::/64;  
}
```

Some Results

- Number of users
 - Not many, 10-12 devices peak
- Performance
 - No noticeable degradation compared to the dual stack SSID
- What works and what doesn't
 - Skype
 - Dropbox
 - Some users reported Twitter not working, couldn't confirm

Some results (ii)

- The good about it:
 - No kernel modules needed
 - No unnecessary or possibly conflicting** IOS upgrades to perform on the Cisco boxes
 - Easier troubleshooting / user tracking as every NAT64ed hosts has its own IPv4 address
 - Stateful NAT performed at network's edge

THANKS !