

SDN IXP

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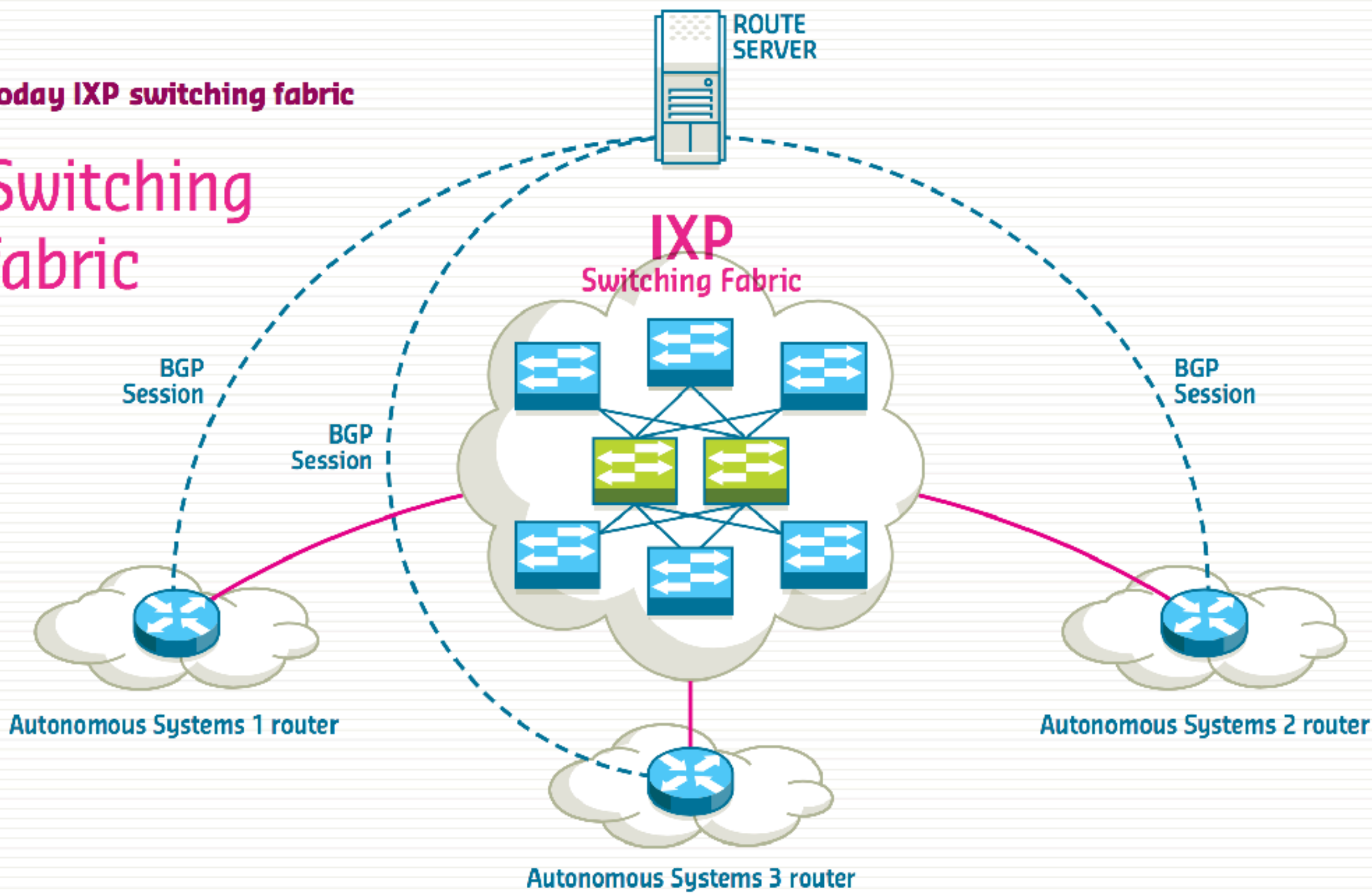


Agenda

- SDN momentum for IXPs - Umbrella
- Toulouse IXP - TouIX to TouSIX
- Tokyo IXP - DIX-IE to PIX-IE
- Osaka - NSPIXP-3 to FAUCET Umbrella

Today IXP switching fabric

Switching fabric



Issues with today IXP switching fabric

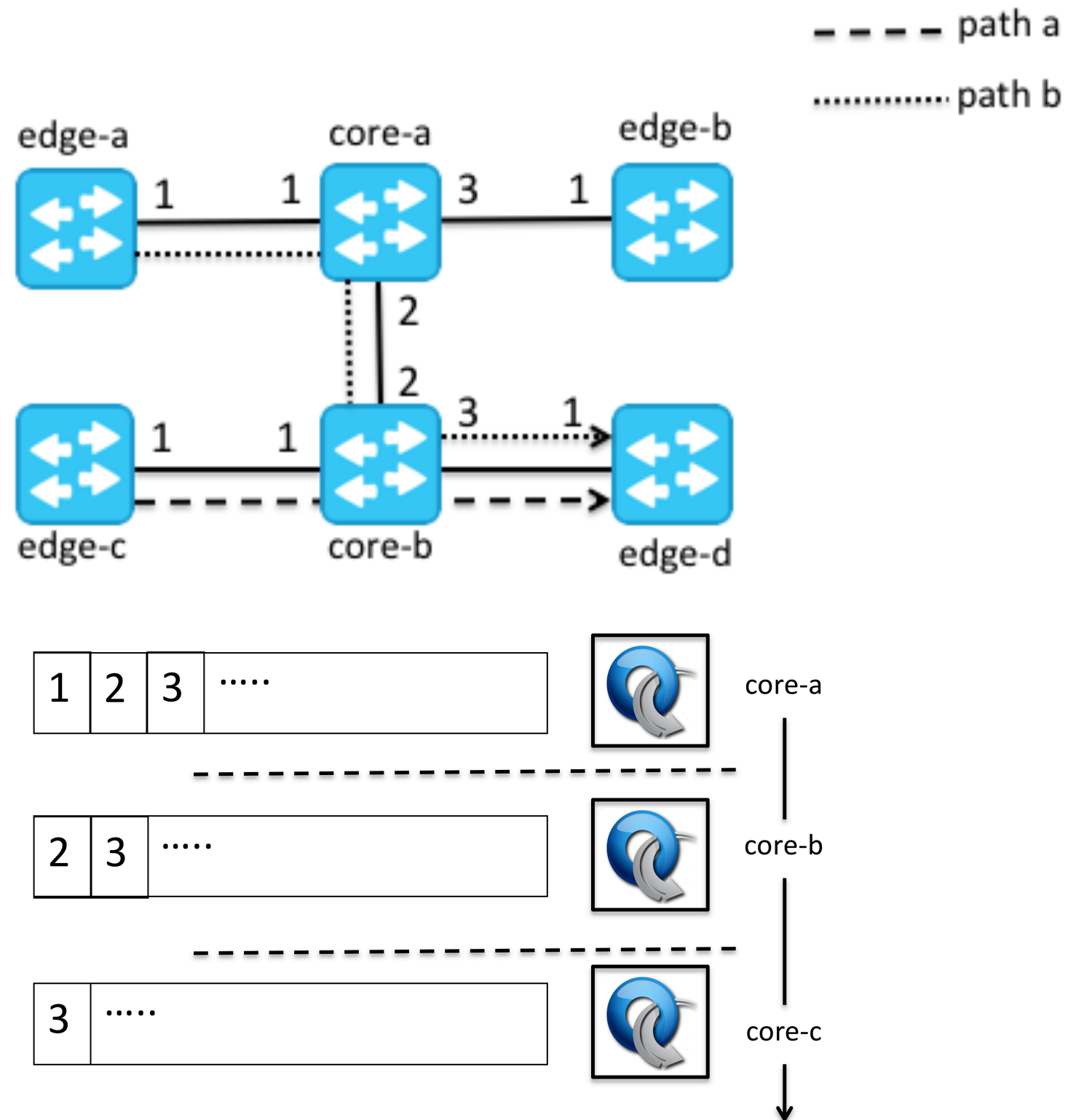
IXP switching fabric are shared Layer 2 broadcast domain

- Broadcast traffic can weaken router CPU or even neutralize the entire IXP
- Loop Free solutions are not perfect
- Hard to scale up
- Undesired traffic are hard to be kept out
- Monitoring is too limited or too complex

Umbrella architecture

- No more Broadcast and perfect edge filtering
- Pseudo Wire
- Can run even if the control plane is down
- Works even without OpenFlow switch in the core
- Fined-grained monitoring with OpenFlow
- Scalable for more PoPs and IXPs Members
- Open to future applications Oriented IXP Customer

Umbrella architecture

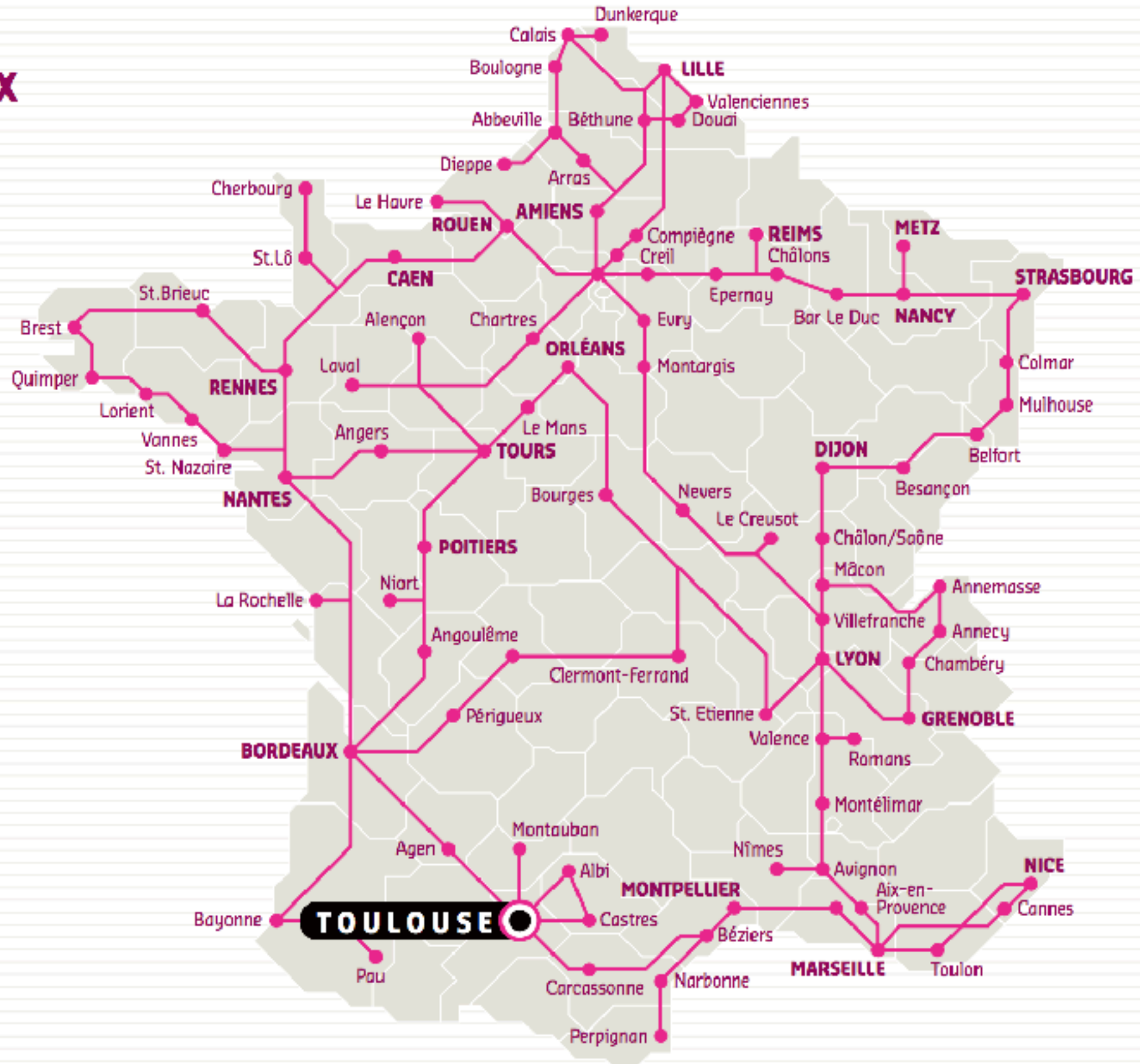




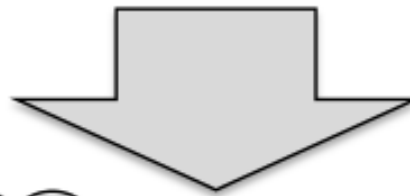
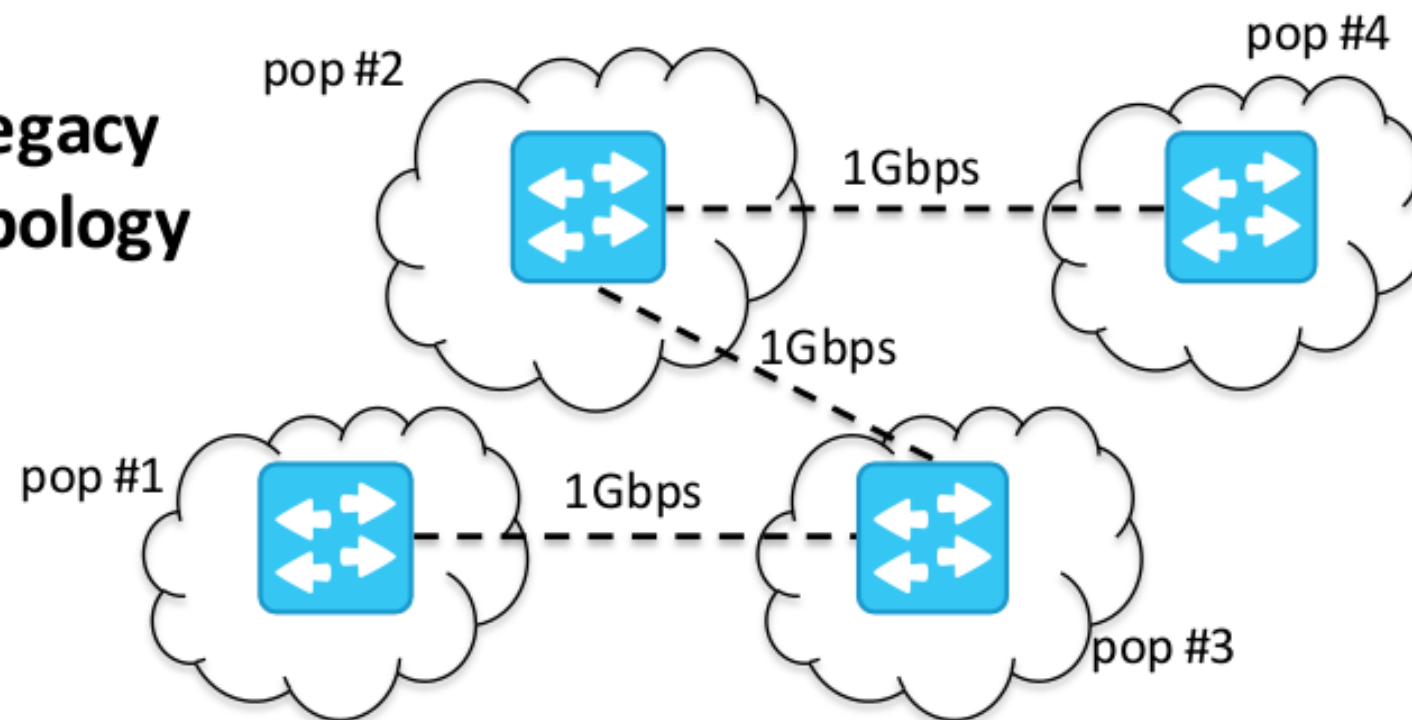
- Founded in 2006
- ToulIX is a EURO-IX member
- 4 PoPs
- 10 active members
- Interconnected to France-IX and Lyon-IX

The Toulouse IXP : ToulIX

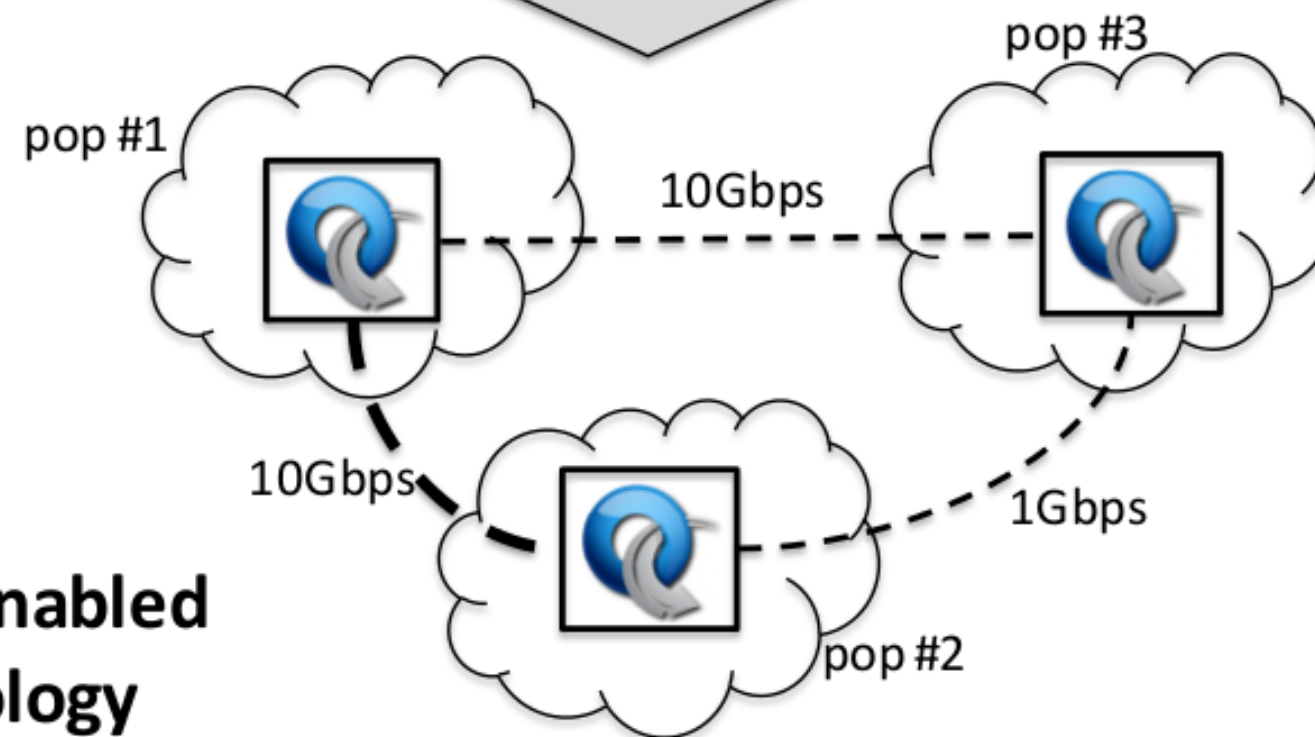
Toulouse context



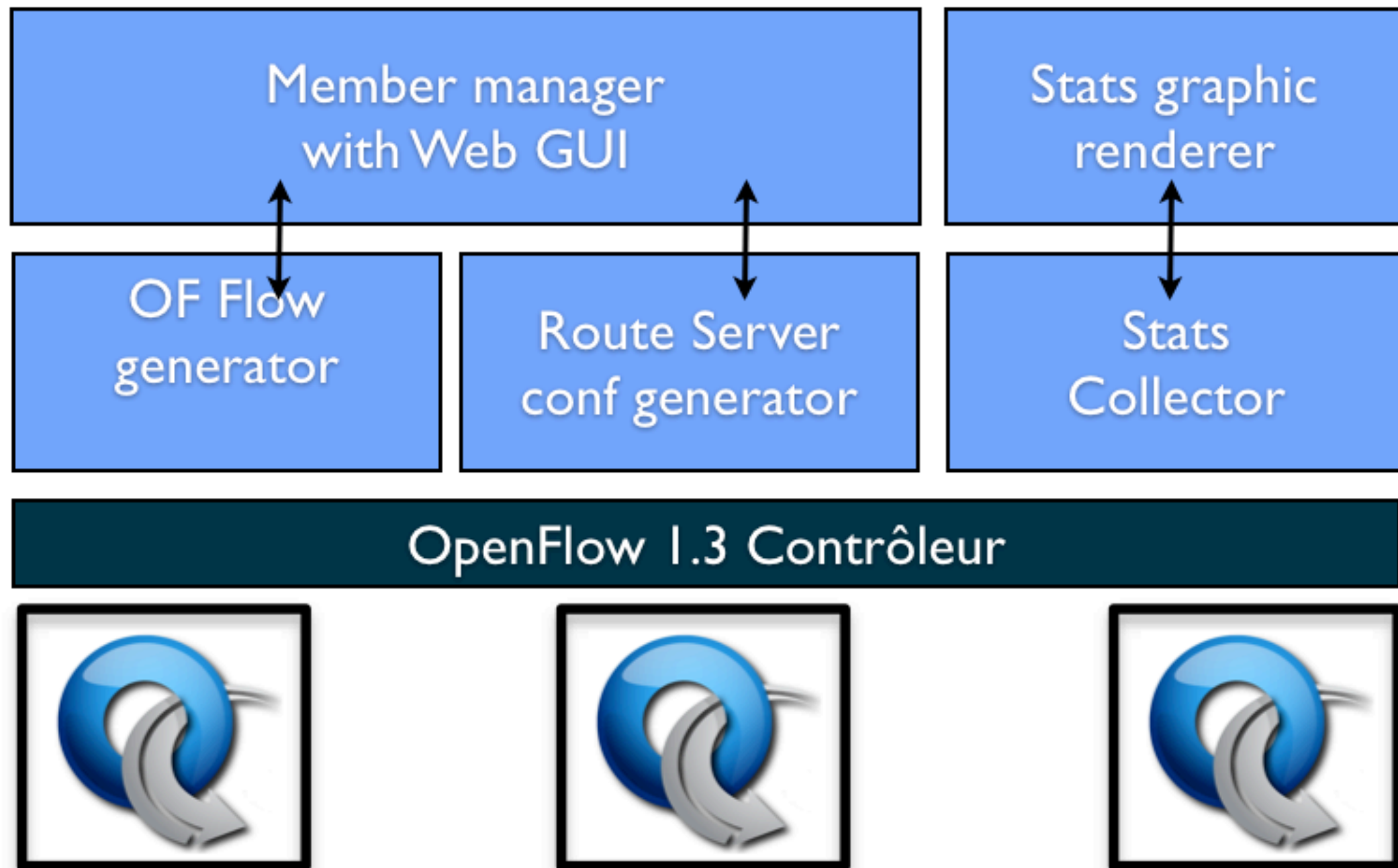
Legacy topology



SDN-enabled topology



TouIX- TouSIX-Manager



In live

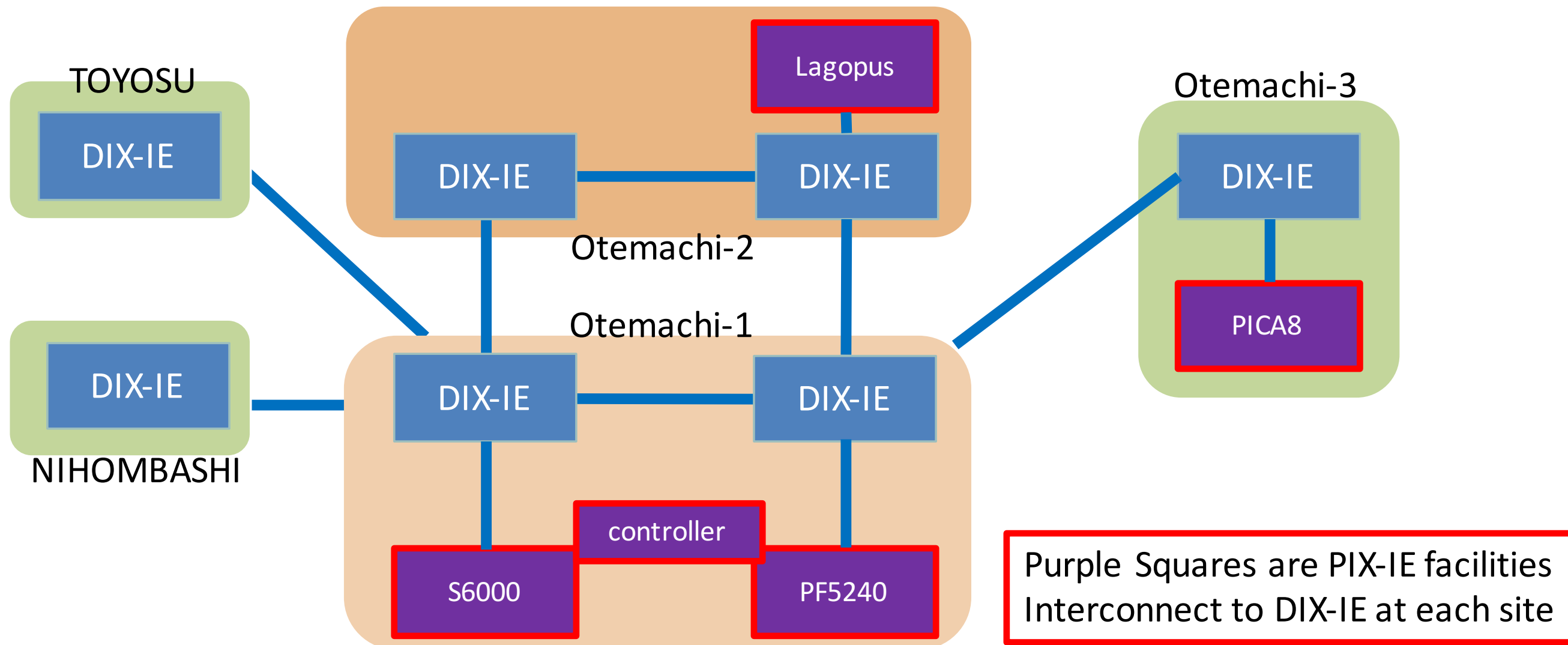
TouSIX - Conclusion

- Umbrella proved to be a good architecture
- More than 2 years without any issue
- Creating an Open Source community is hard



- PIX-IE: A Programable Internet eXchange In Edo
- DDoS Mitigation functions
- On demand Path selection
- Proxy-ARP - external database

PIX-IE



PIX-IE Conclusion

- InterOp ShowNets Tokyo
- PIX-IE running in production for 2 years
- Positive combination OpenFlow and DDoS mitigation
- Proxy-ARP for IXP has important flexibility limitation

NSPIXP-3 OSAKA

- National carrier connected to the DNS M roots server
- A single switch - 10 Operators
- Multi VLANs
- Can not be replace in one time

FAUCET Umbrella

- Unicasting all ARP/ ICMPv6 broadcast - Done
- Group Fast Failover - Testing in progress
- Umbrella label switch encoding - WiP

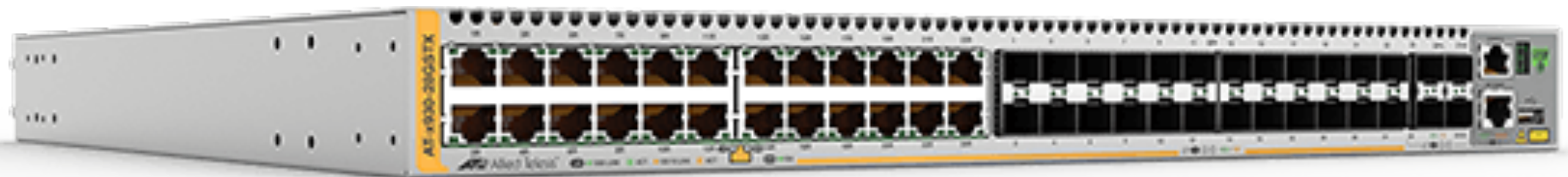
```
vlan:
  100:
    name: "dataplane_umbrella"
dps:
  dataplane:
    dp_id: 0x1
    interfaces:
      1:
        native_vlan: 100
        name: "port1"
        acl_in: 1
      2:
        native_vlan: 100
        name: "port2"
        acl_in: 1
acls:
  1:
    - rule:
        dl_type: 0x0806
        dl_dst: "ff:ff:ff:ff:ff:ff"
        arp_tpa: "10.0.0.1"
        actions:
          output:
            port: 1
    - rule:
        dl_type: 0x86dd
        ip_proto: 58
        icmpv6_type: 135
        ipv6_nd_target: "2001::1/128"
        actions:
          output:
            port: 1
```

Allied Telesis x930-28GTX

All test OK !!

AlliedWare Plus file name : x930-5.4.6-2.6.rel

A an additional OpenFlow Licence was required.

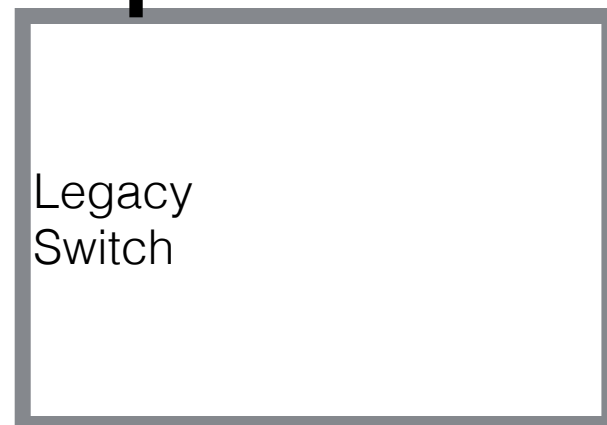


Configuration file FAUCET.yaml
Unicasting all broadcast
Multi VLANs
IPv4 and IPv6

Grafana
Graphing Web front end
InfluxDB
Time Series DB



VLAN to Tokyo



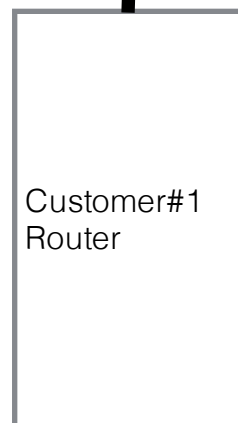
10Gbps

OpenFlow
Switch

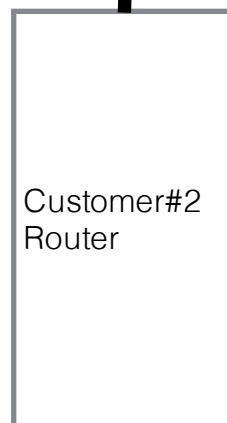
1Gbps

Wide project
Peering test
Router

VLAN peering



...



In live

Where are we

- NSPIXP-3 Full migration expected Early 2018
- TouSIX-Manager with FAUCET Umbrella End and Pica8 with AT switch expected at the end 2017
- Integrating FAUCET Umbrella in IXP-Manager.org



ENDEAVOUR



<http://www.h2020-endeavour.eu>



