# OpenFlow-based Migration and Management of the ToulX IXP

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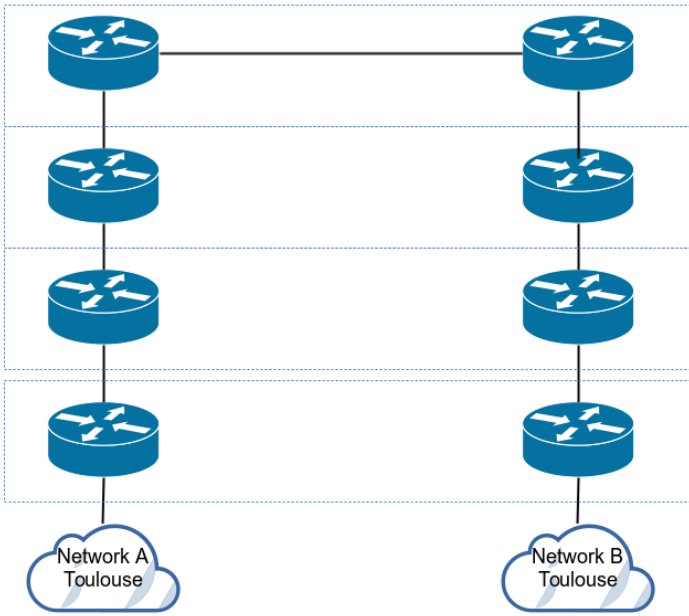
# Content

# Inter-networking methods

## Transit network

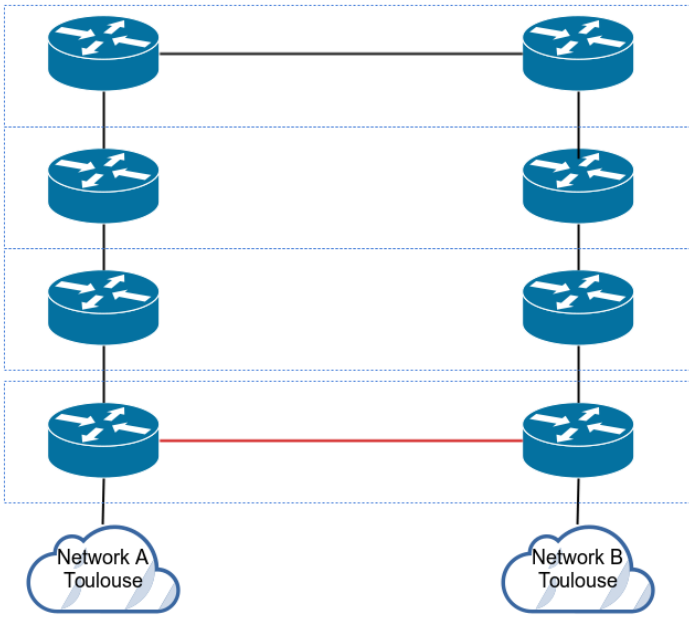
- Give access on the entire geographical network
- Pays per quantity transited
- Network shared with other customers



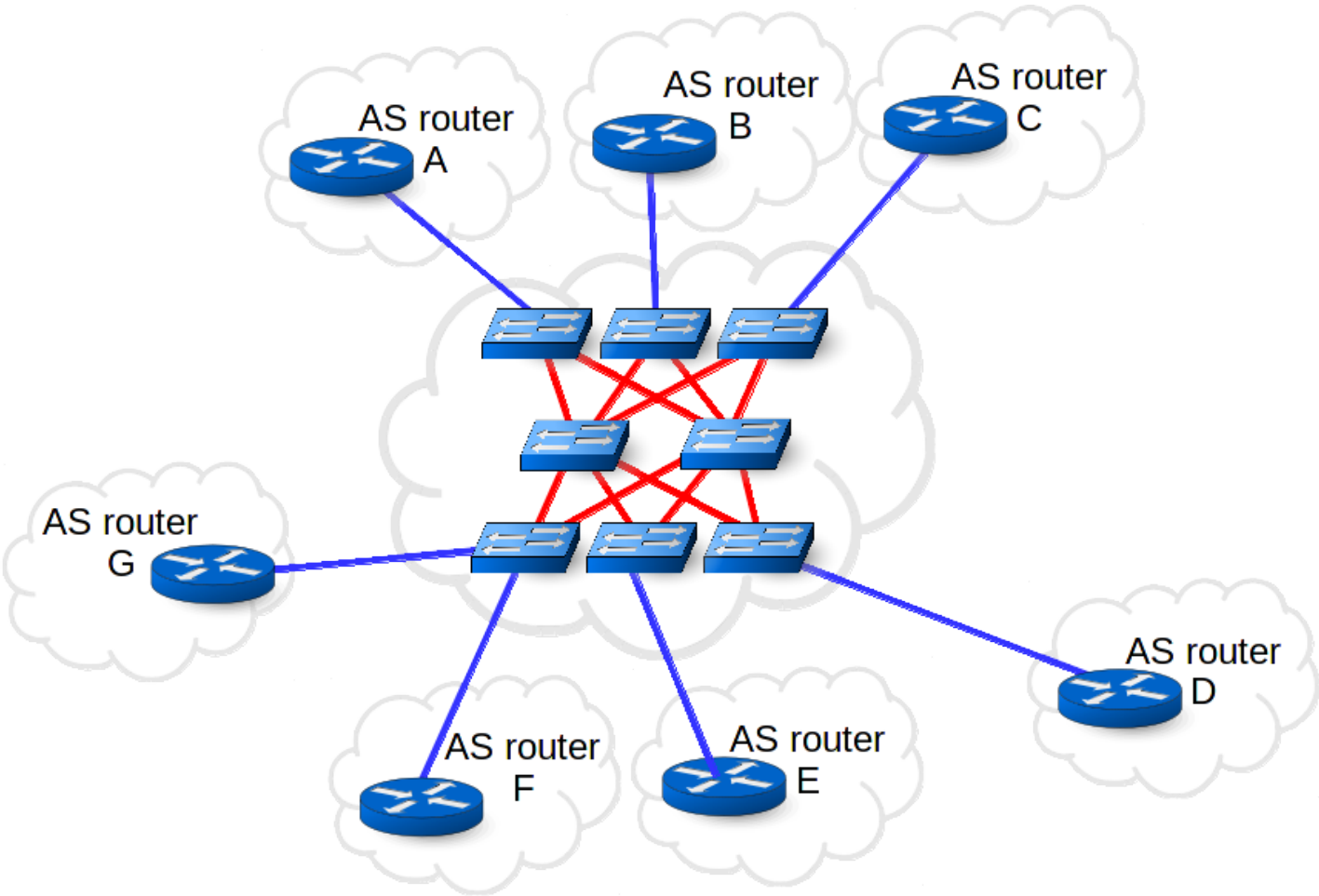
# Peering network

## Benefits

- No restriction on traffic (cost reduced)
- Latency reduced
- Security increased



# Typical IXP fabric



# IXP strengths

- Flexibility
- Low-cost shared infrastructure
- Security

# SDN

Decoupling control plane from data plane

- More flexible network
- Less constraints from constructor implementation

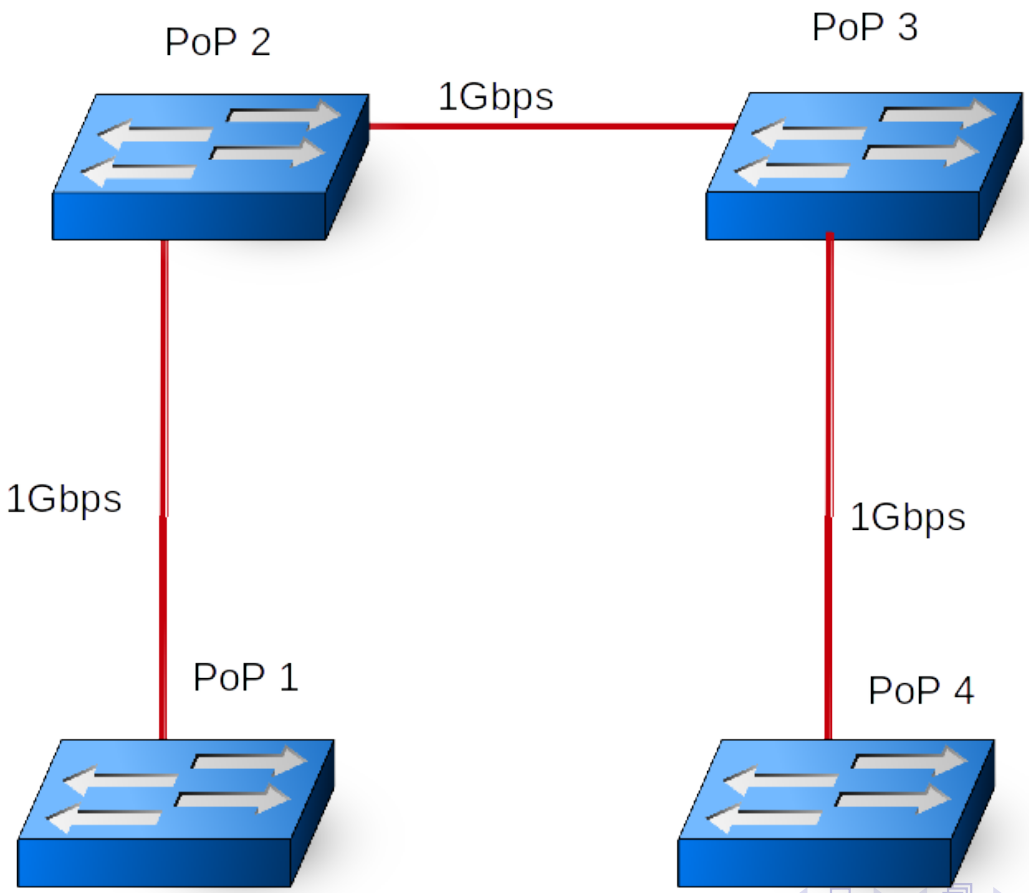
Popular norm: OpenFlow

# TouIX

- 10 members announcing IP prefixes and sharing data
- Available on 4 PoP


http://touix.net/

# TouIX topology



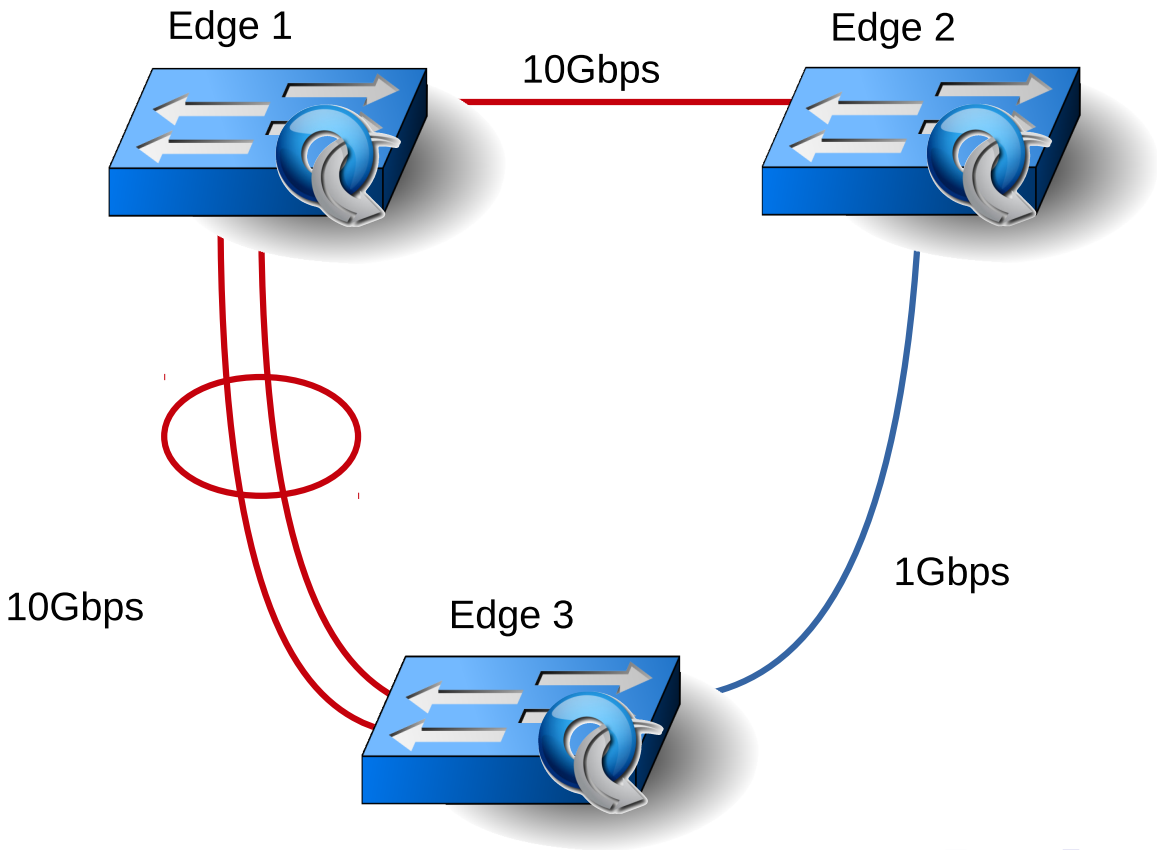
# TouSIX project

Replace TouIX IXP with native OpenFlow fabric
Main objectives:

- Help on management and availability of the network
- Full OpenFlow monitoring
- Open to new services with SDN

Toulouse SDN Internet eXchange

# Network topology

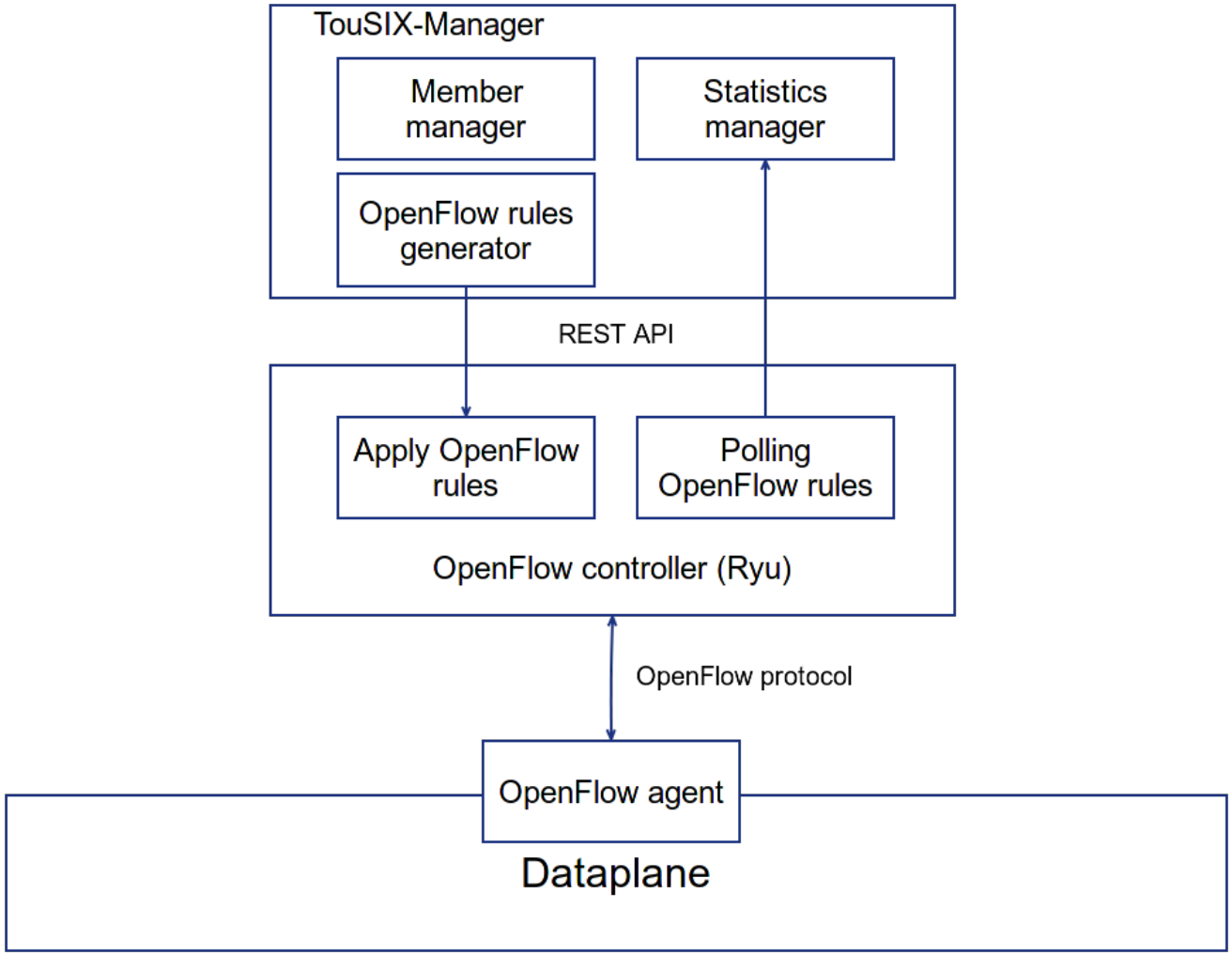


# Switch configuration

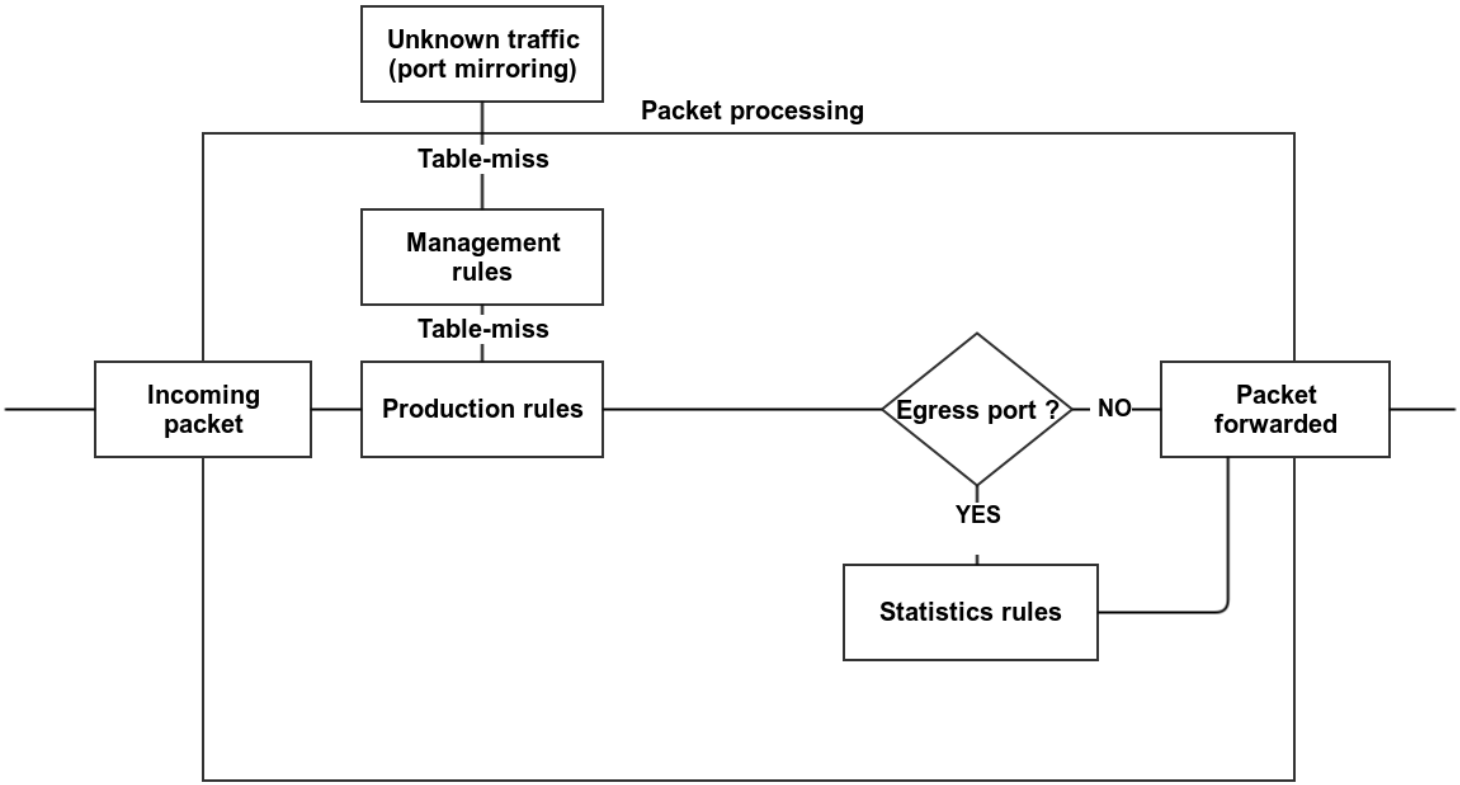
## Choice

- Pica8 + PicOS
- Whitebox switch: OpenVSwitch
- OpenFlow 1.3 MultiTable

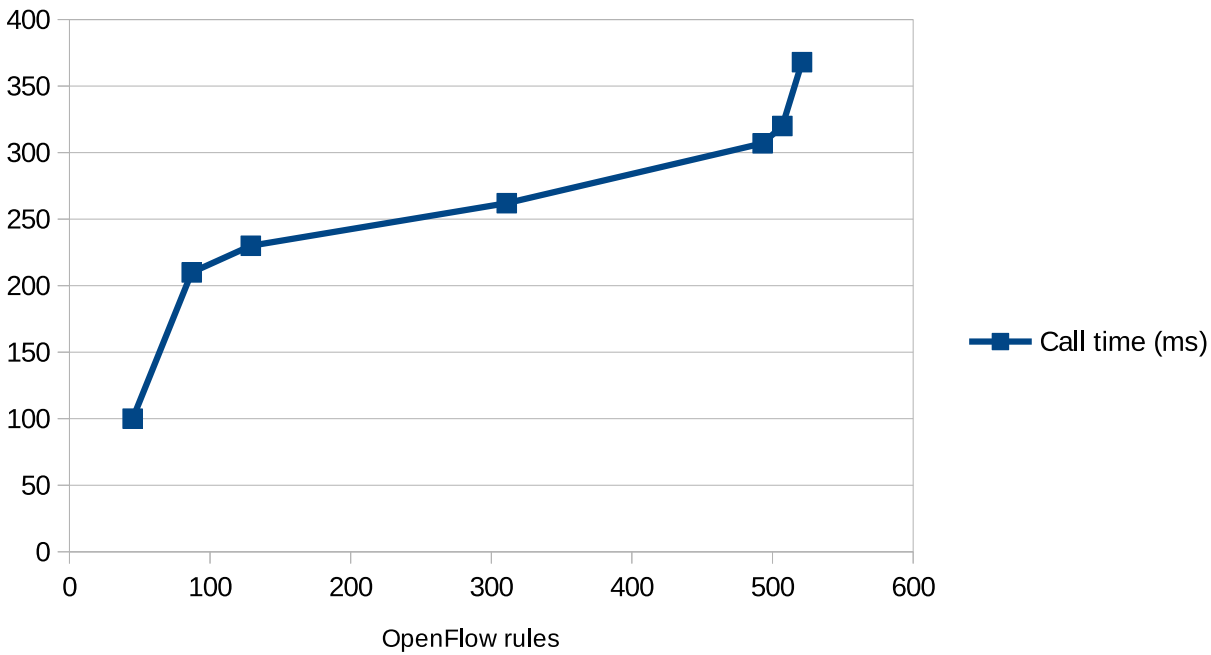
# Software architecture



# OpenFlow rules management

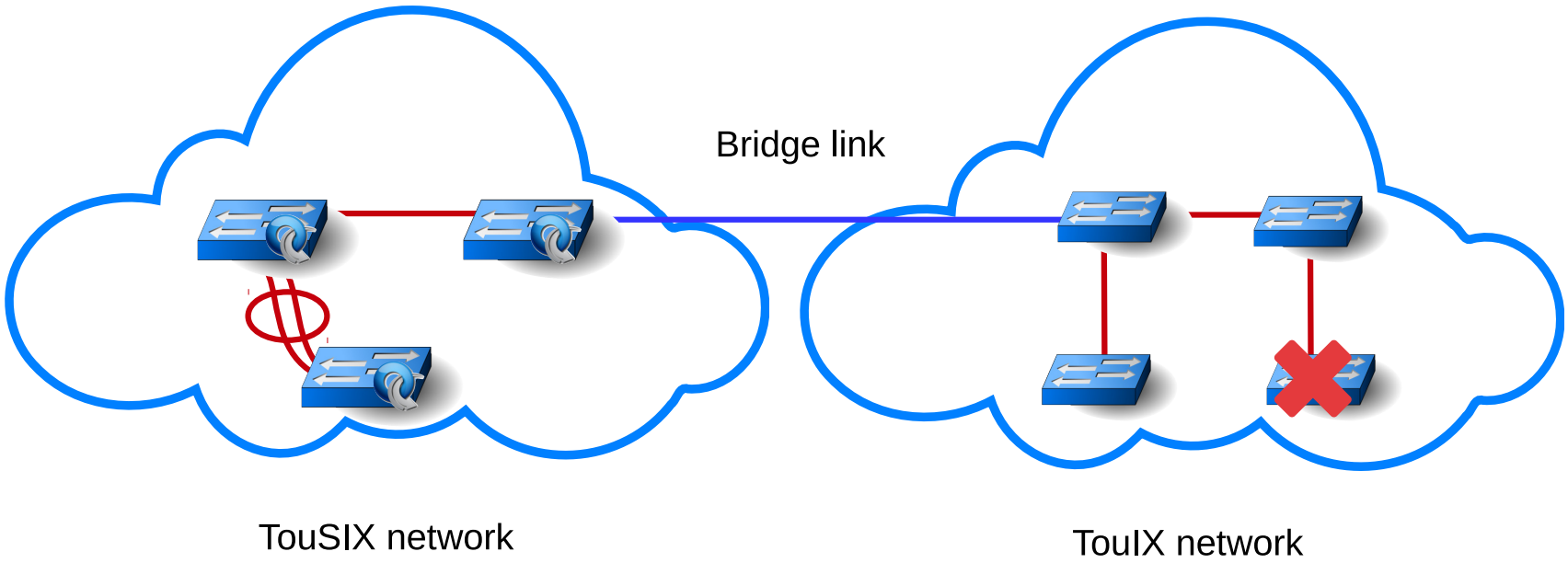


# Statistics performance

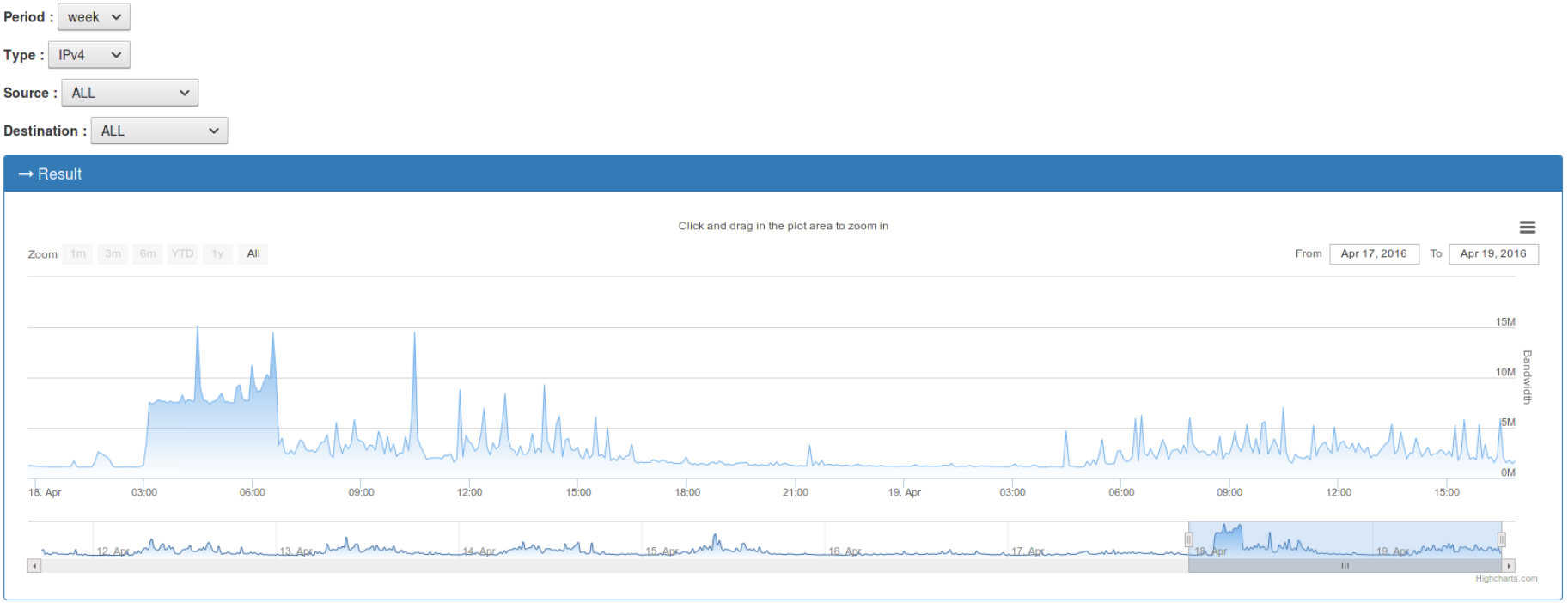



Rules generation module execution time

# Deployment



# Statistics sampling




Total IPv4 traffic on ToulX IXP (18-19th april).

# Conclusion

- 1st operationnal european IXP leveraging SDN
- Foundation for experimental research platform