UMBRELLA Fabric OpenFlow SDN

The TOUIX to TOUSIX experience

Marc Bruyère, CNRS

TOUIX

LAAS CNRS

INSTITUT CARNOT LAAS CNRS

TouSIX First OpenFlow European IXP

What is an IXP ?

Today IXP switching fabric

Operator-oriented OpenFlow IXP fabric

The Toulouse IXP : TouIX

Migrating TouIX in TouSIX

TouSIX-Manager

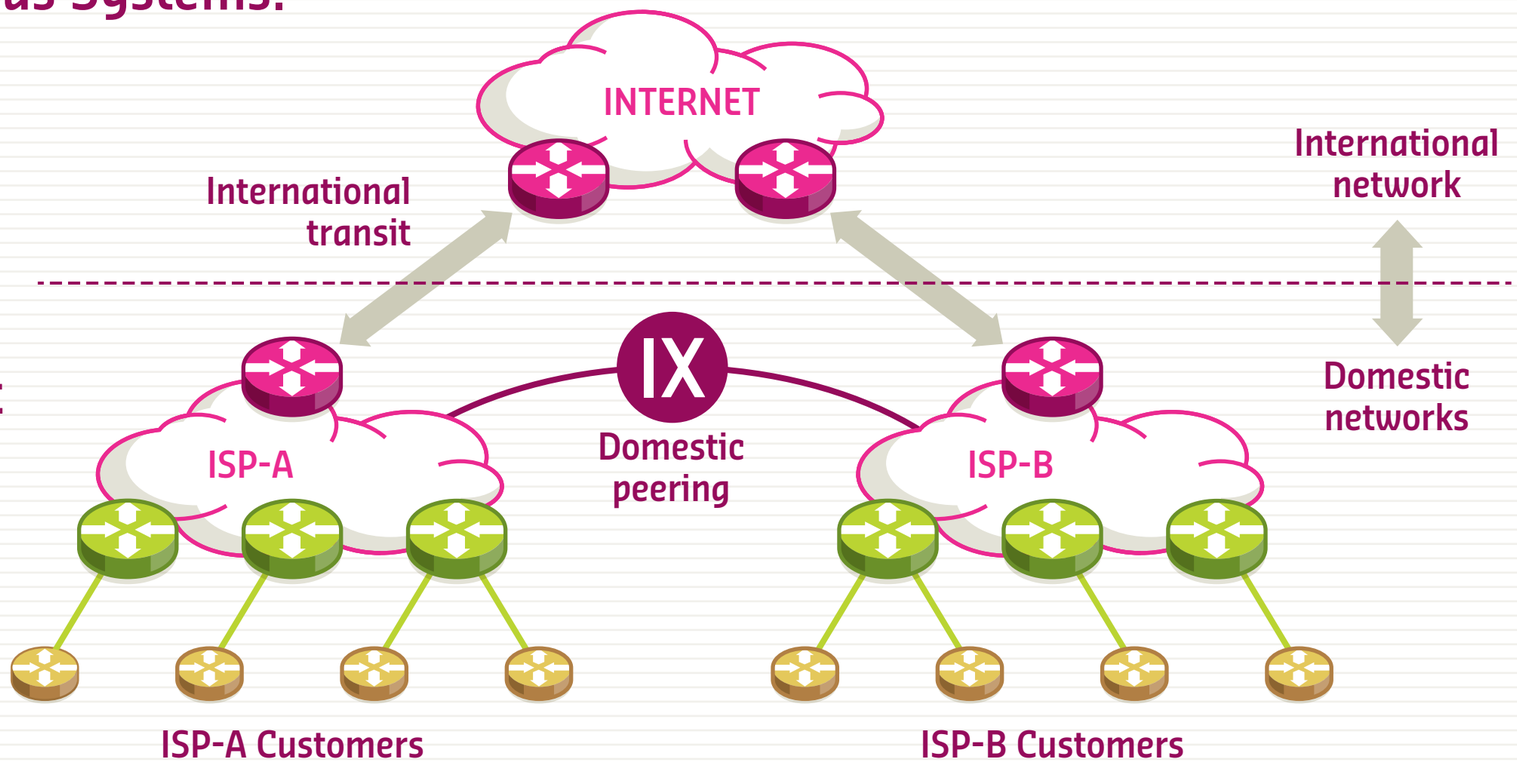
What's next

What is an IXP ?

An Internet Exchange Point (IXP) is a network facility that enables the interconnection and exchange of Internet traffic between more than two independent Autonomous Systems.

Direct benefit :

- ✓ Lower Latency
- ✓ Reduce transit cost
- ✓ Increase security



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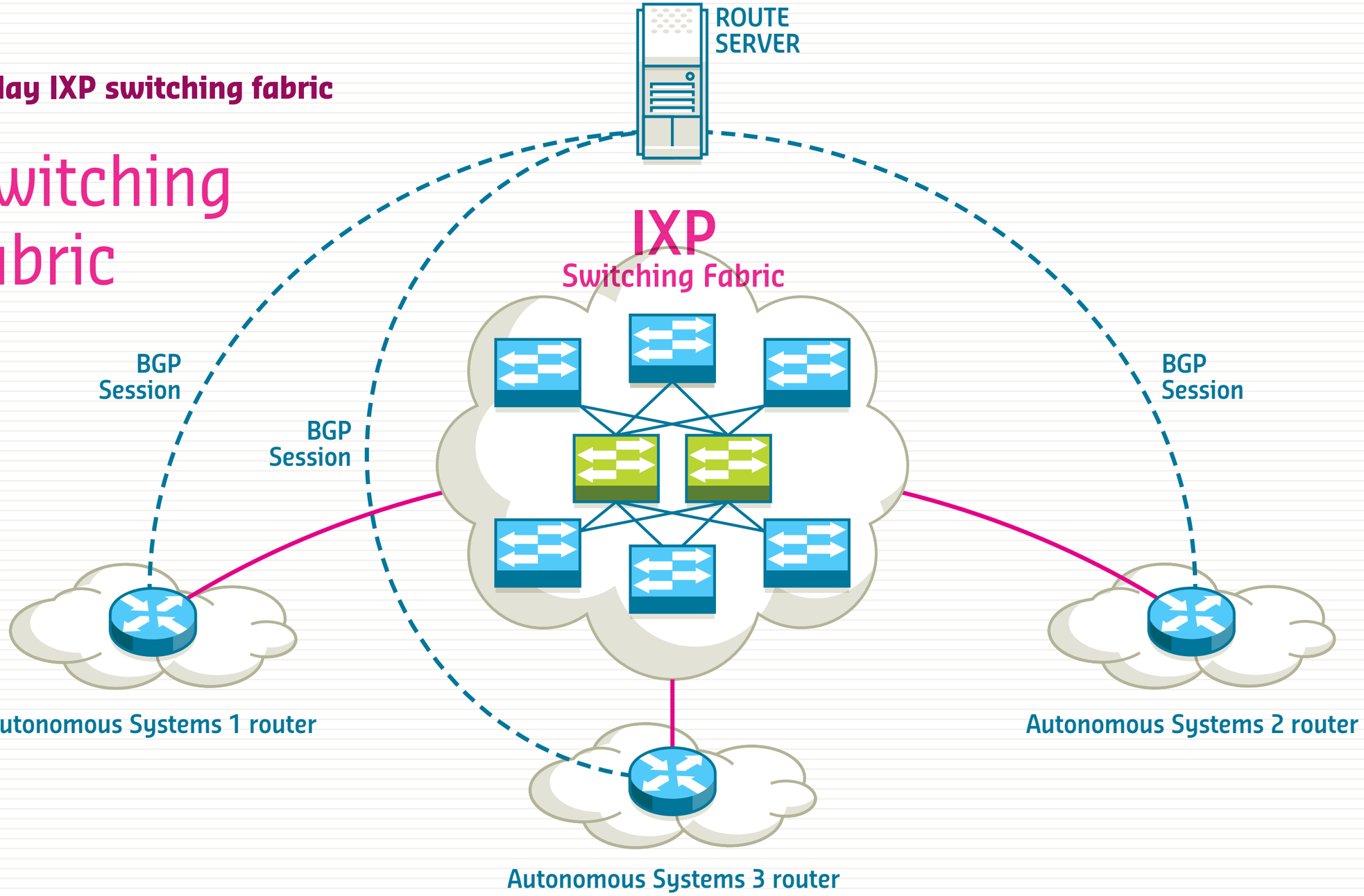
Today IXP switching fabric

Switching fabric



Issues with today IXP 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
- Undesired traffic are hard to be kept out
- Monitoring is too limited or too complex

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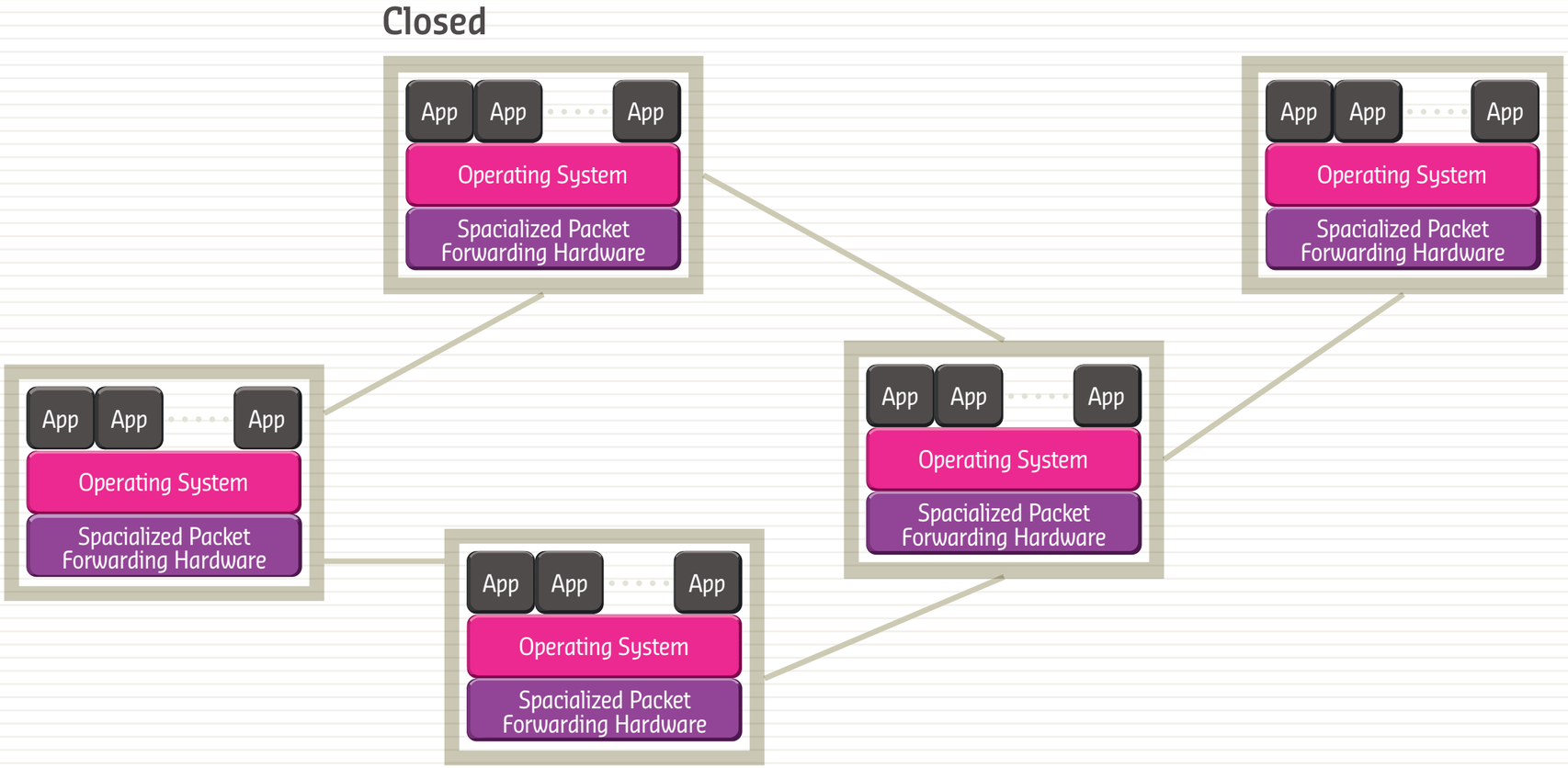
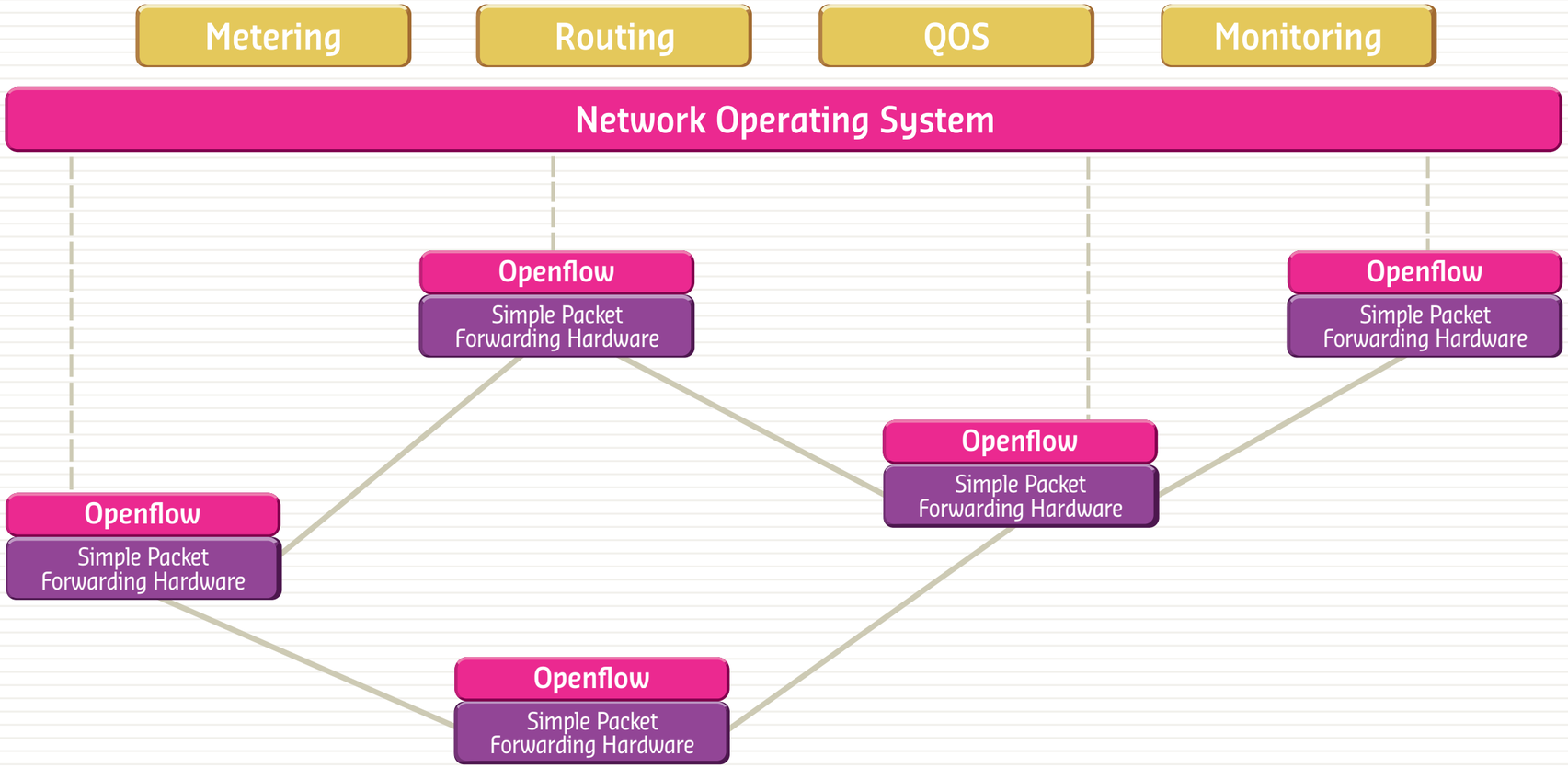
Non SDN configuration




WENGER

Operator-oriented OpenFlow IXP fabric

SDN configuration



Operator-oriented OpenFlow IXP fabric

- 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
- Link redundancy with Group Fast Failover
- Scalable for more PoPs and IXPs Members
- Open to future applications Oriented IXP Customer

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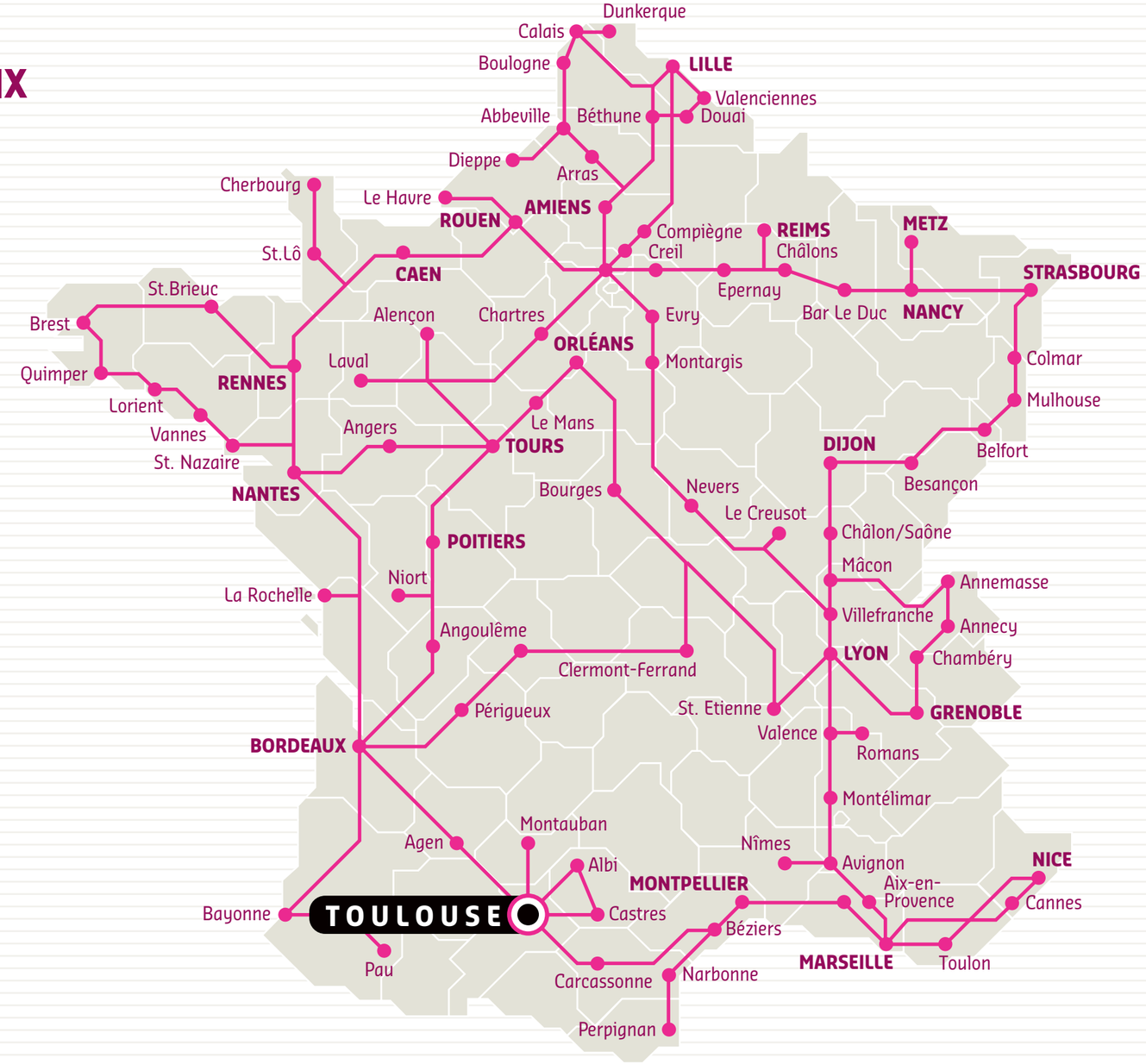
The Toulouse IXP : ToulX

Toulouse context



The Toulouse IXP : TouIX

TouIX

- Founded in 2006
- TouiX is an EURO-IX member
- 4 PoPs around Toulouse city
- 10 active members
- 300K Ip prefixes
- Interconnected with France-IX and LyonIX

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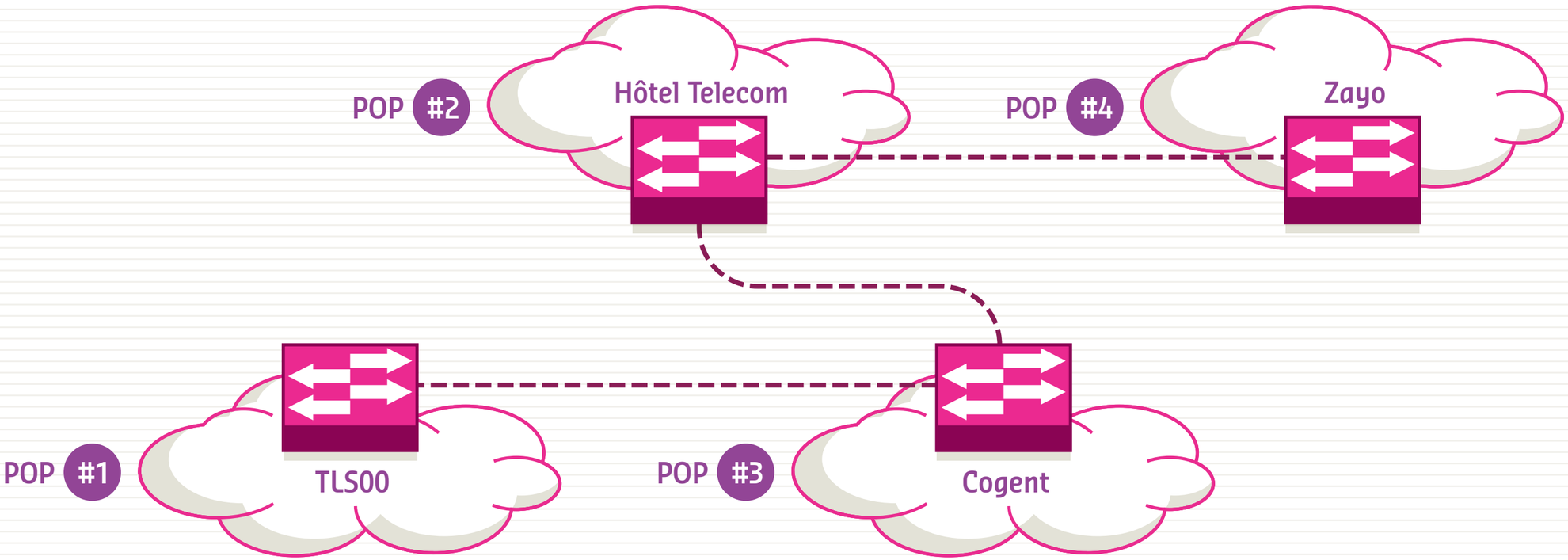
ToulX old topology



The Openflow switch selected

- OpenVSwitch 2.x
- Openflow 1.3
  Multi Table

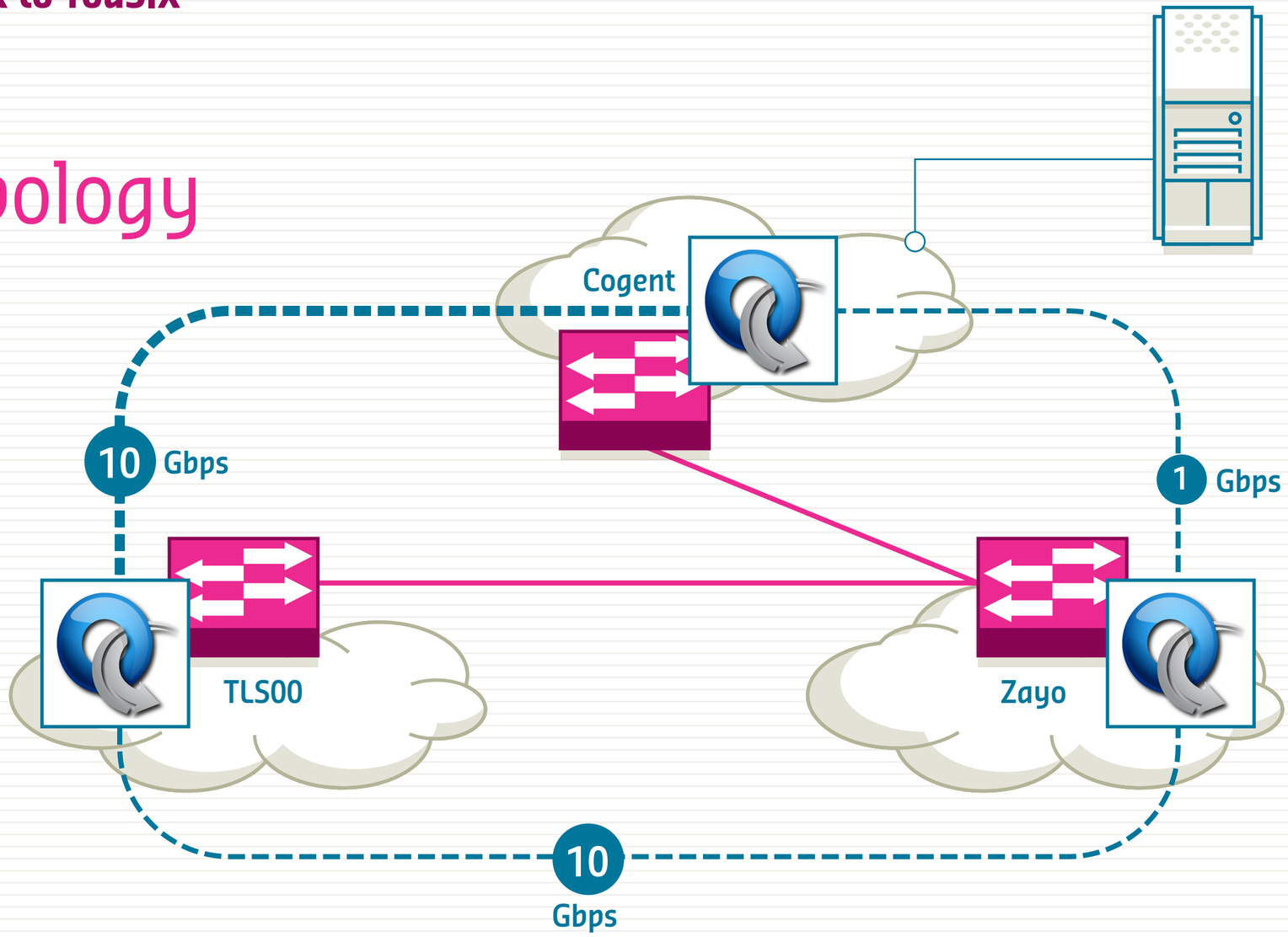
PICA8 WHITE BOX SDN

Migrating ToulX to TouSIX

TouSIX new topology

OpenFlow Ctrl and France-IX

Data



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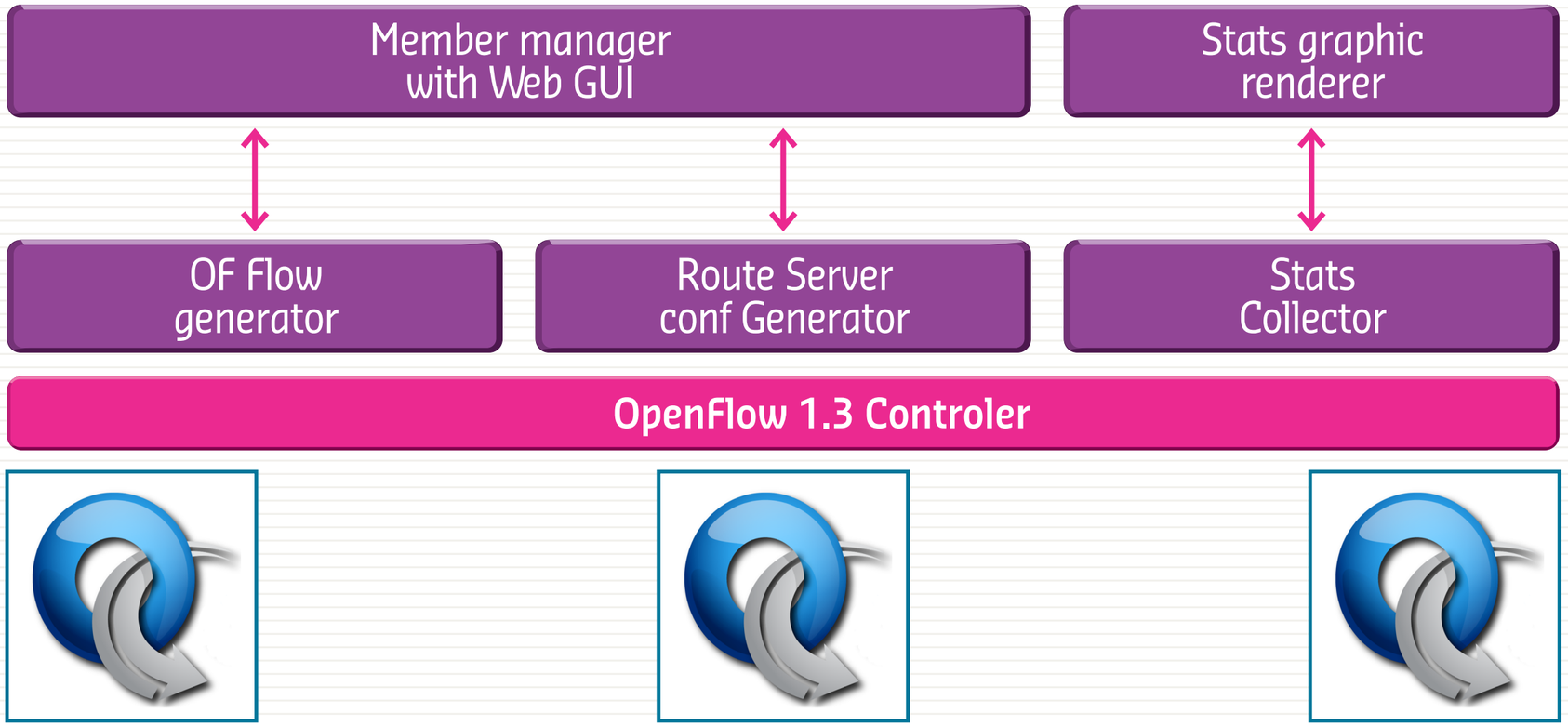
TouSIX-Manager architecture



Please join !

All code can be found at:

https://github.com/umbrella-fabric/TouSIX-Manager

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An IXP open to innovation

The following TouSIX members are funding a PhD student to do research

- ★ Alsatis
- ★ Covage
- ★ FullSave
- ★ Inter Media Sud
- ★ Tetaneutral.net
- ★ France-IX

What's next

ENDEAVOUR

http://www.h2020-endeavour.eu

mbruyere@laas.fr