

UMBRELLA Fabric OpenFlow SDN

The TOUIX to TOUSIX experience

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東京大学
THE UNIVERSITY
OF TOKYO

TouSIX First OpenFlow European IXP

What is an IXP ?

 Today IXP switching fabric

 Operator-oriented OpenFlow IXP fabric

 The Toulouse IXP : ToulIX

 Migrating ToulIX in TouSIX

 TouSIX-Manager

 What's next

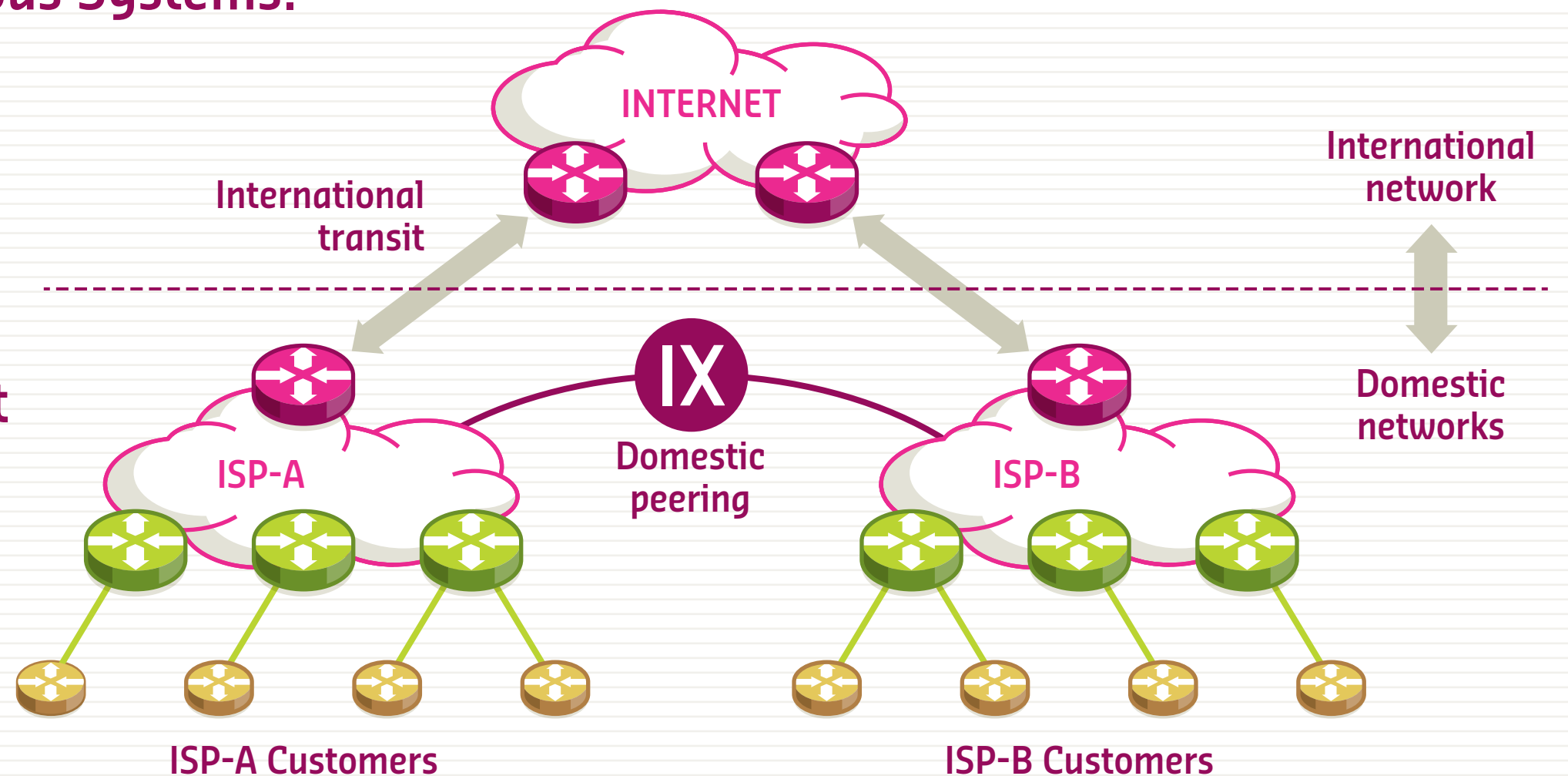
What is an IXP ?

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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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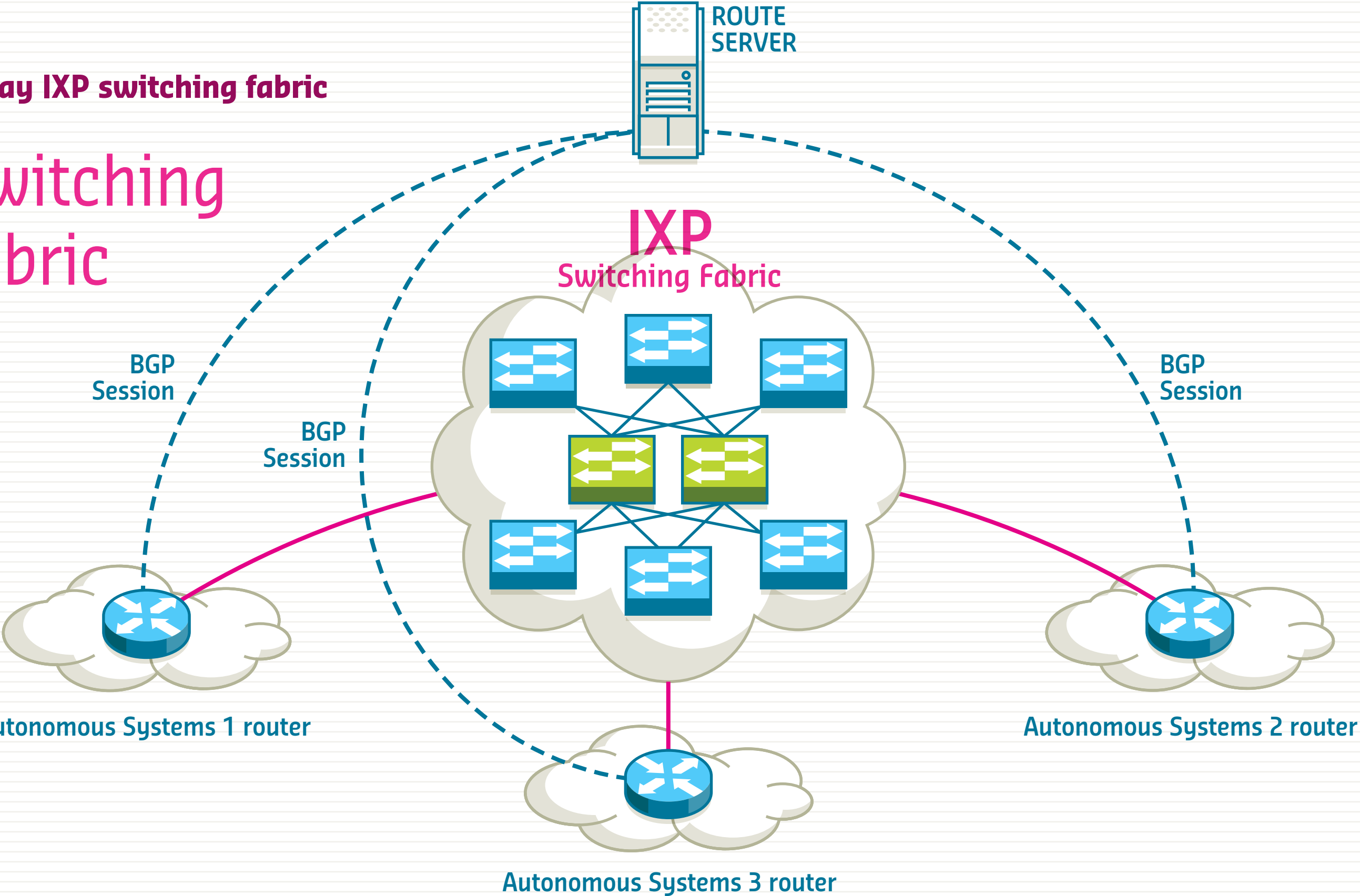
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What's next

Today IXP switching fabric

Switching fabric



Today IXP 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

Today IXP switching fabric



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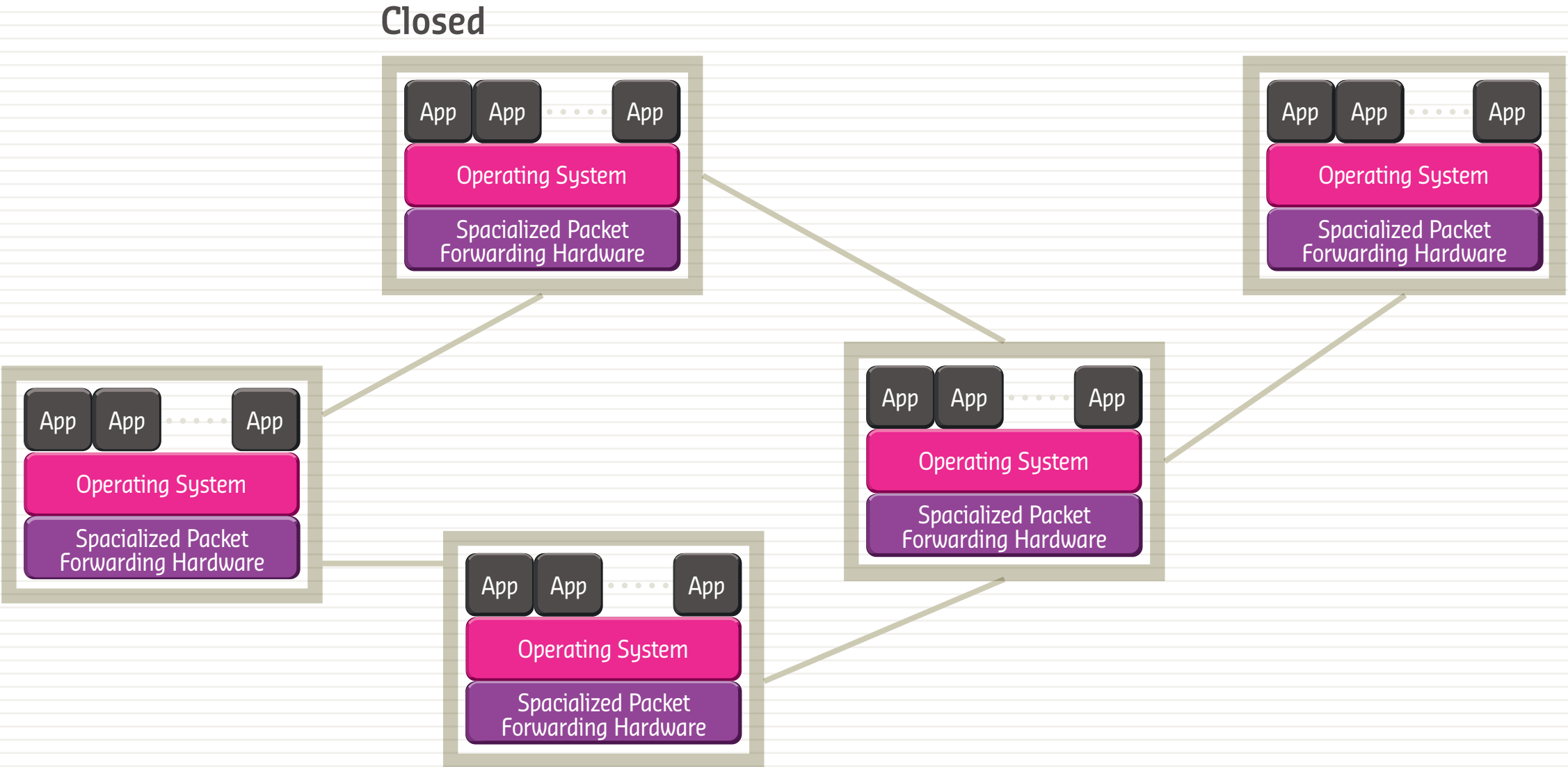
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Operator-oriented OpenFlow IXP fabric



Non SDN configuration

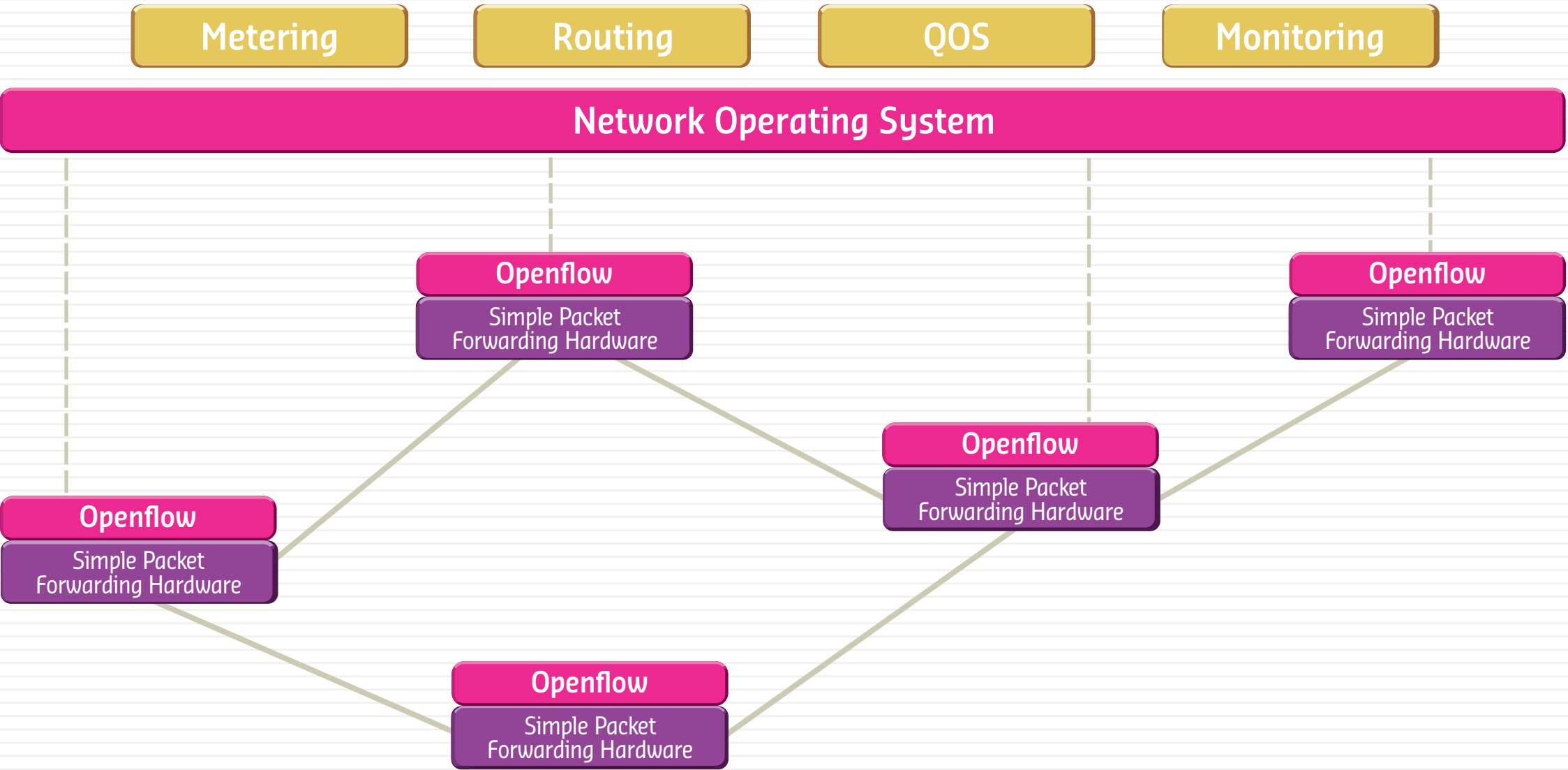




Operator-oriented OpenFlow IXP fabric



SDN configuration







Operator-oriented OpenFlow IXP fabric



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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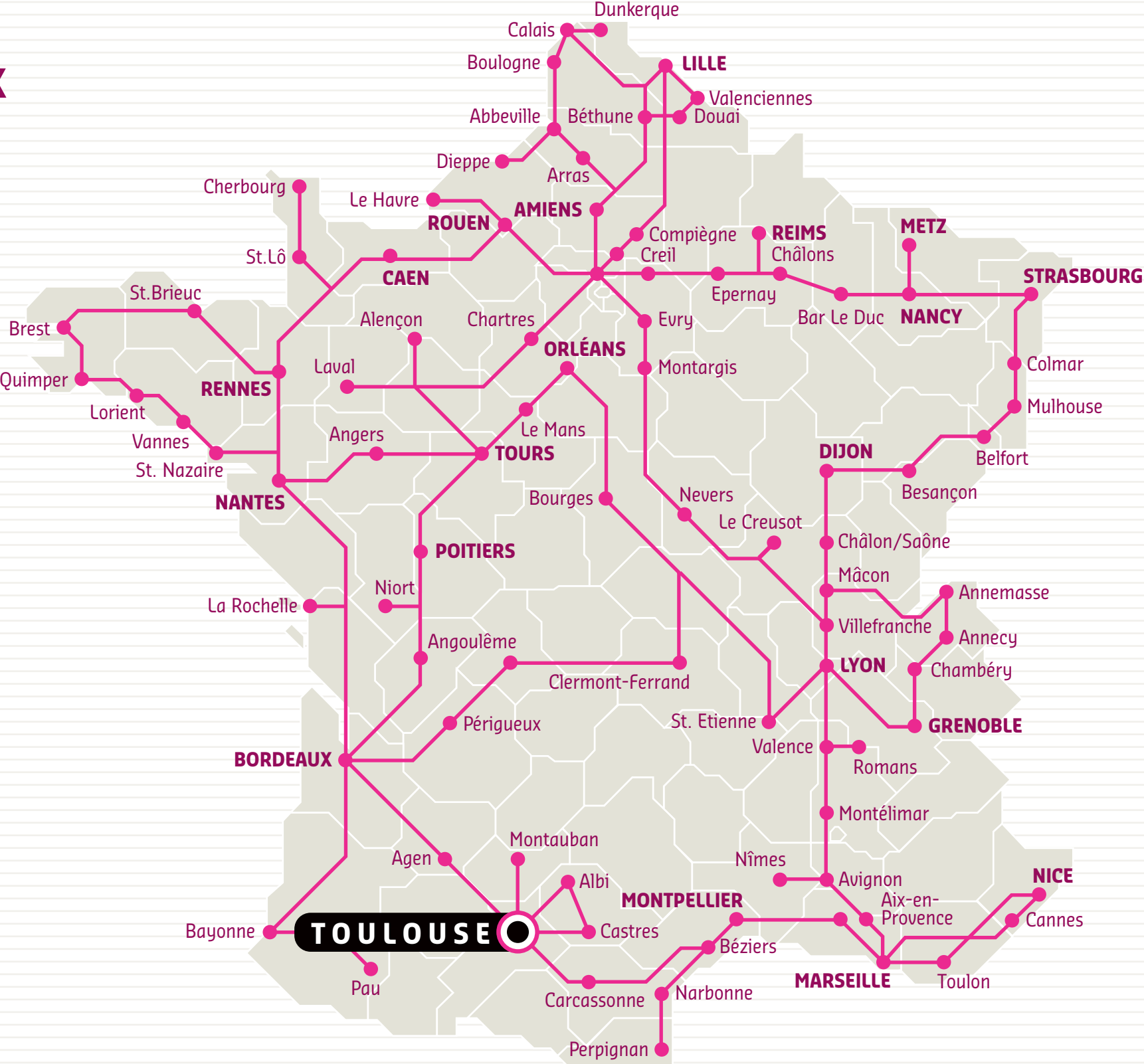
● Migrating TouIX in TouSIX

● TouSIX-Manager

● What's next

The Toulouse IXP : TouIX

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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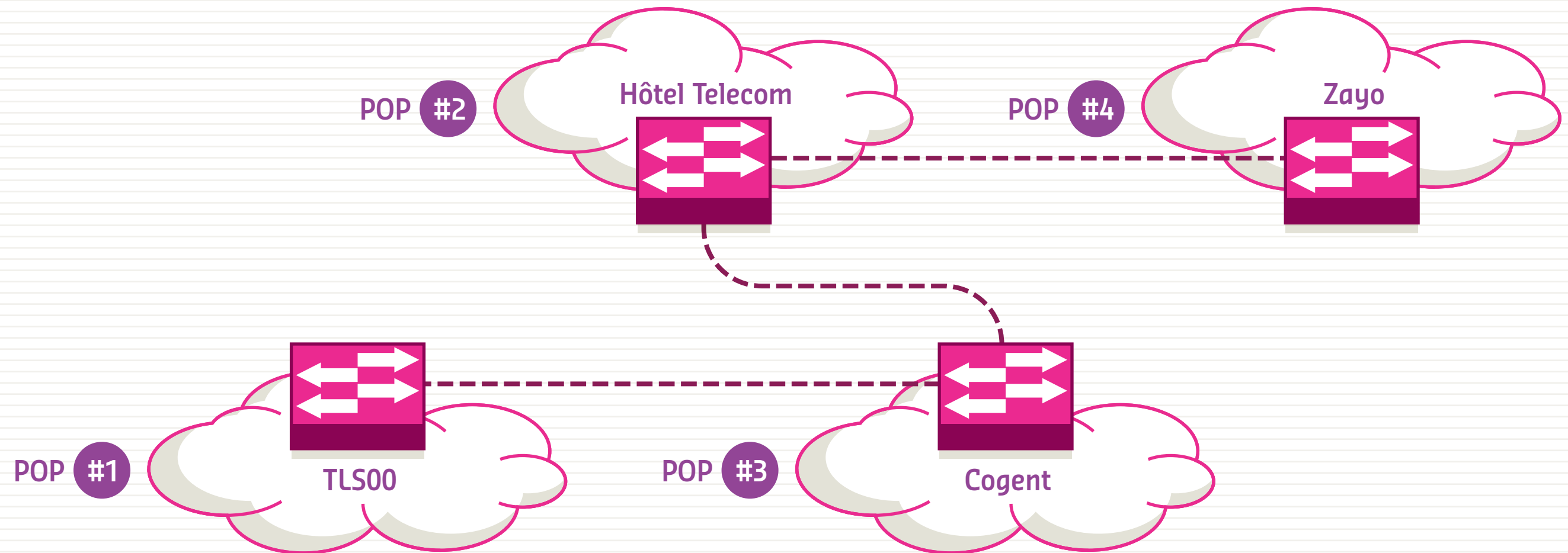
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Migrating ToulX to TouSIX

ToulX old topology



Migrating TouIX to TouSIX

The OpenFlow switch selected

- ❑ OpenVSwitch 2.x
- ❑ OpenFlow 1.3
Multi Table

PIC7A8[®]
WHITE BOX SDN

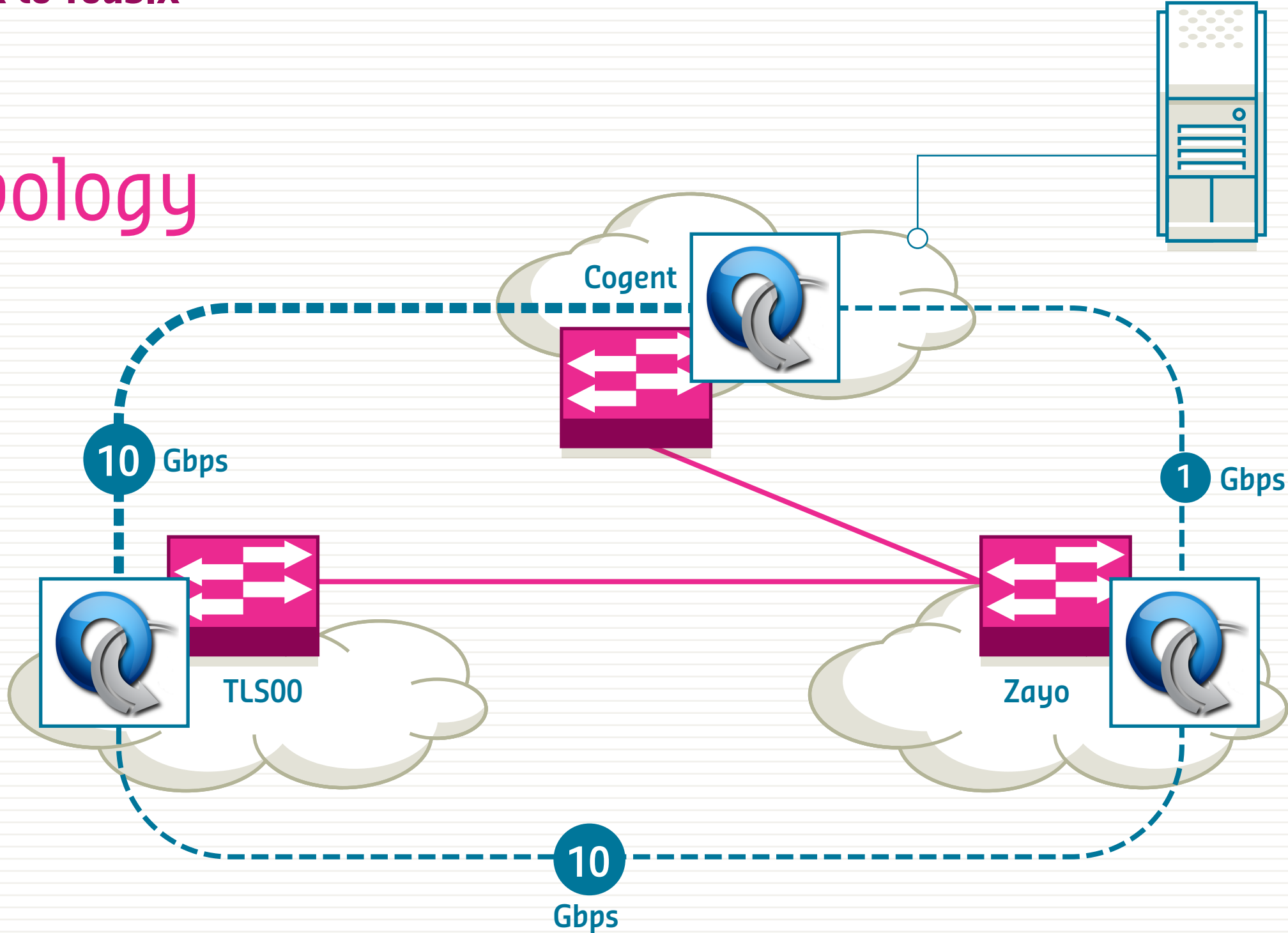


Migrating TouIX to TouSIX



TouSIX new topology

- OpenFlow Ctrl and France-IX
- - - Data



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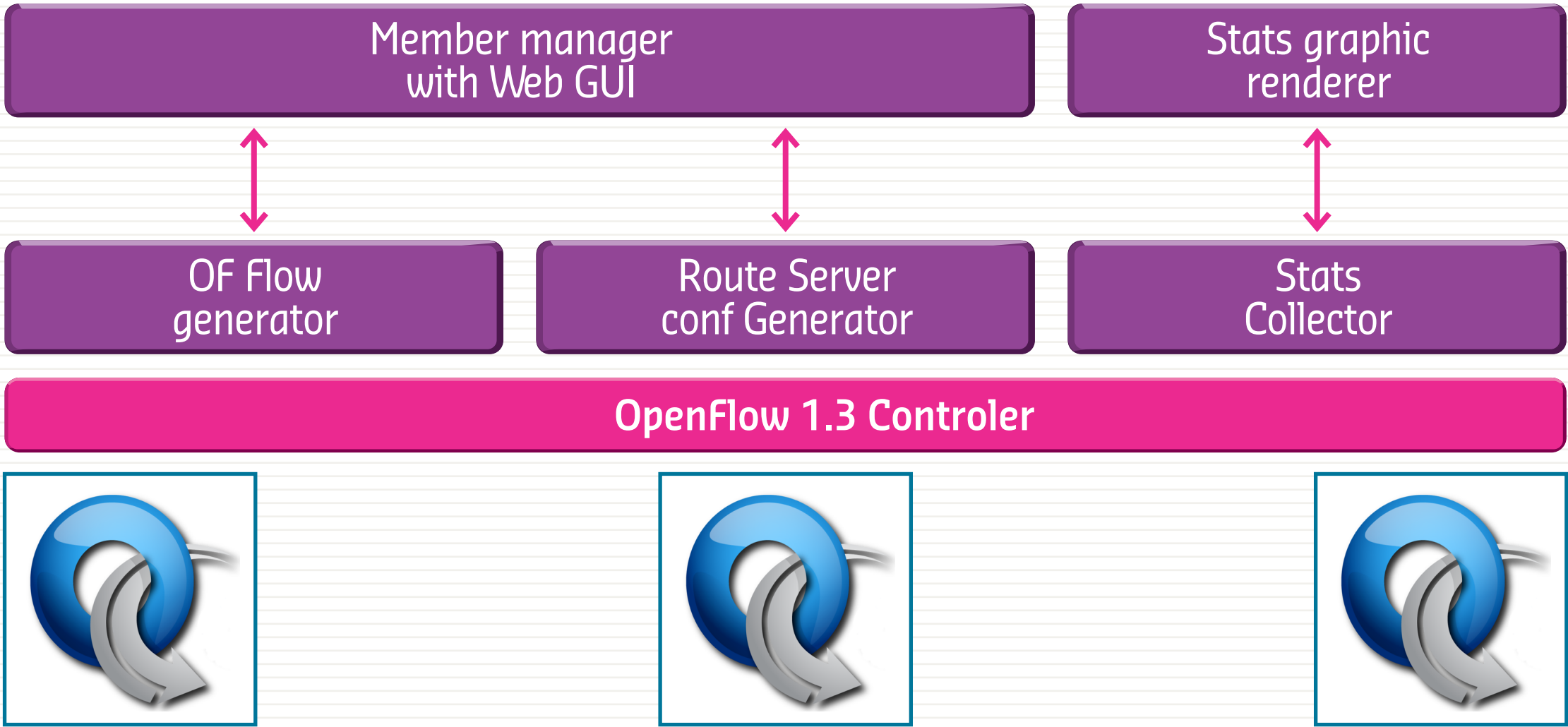
● **TouSIX-Manager**

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TouSIX-Manager



TouSIX-Manager architecture



TouSIX-Manager



Please join !

All code can be found at:

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

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● **What's next**

What's next



An IXP open to innovation

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

★ **Alsatis**

★ **Inter Media Sud**

★ **Covage**

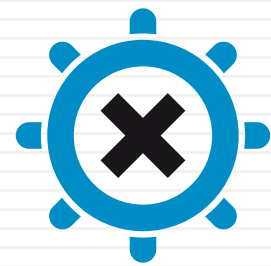
★ **Tetaneutral.net**

★ **FullSave**

★ **france-IX**

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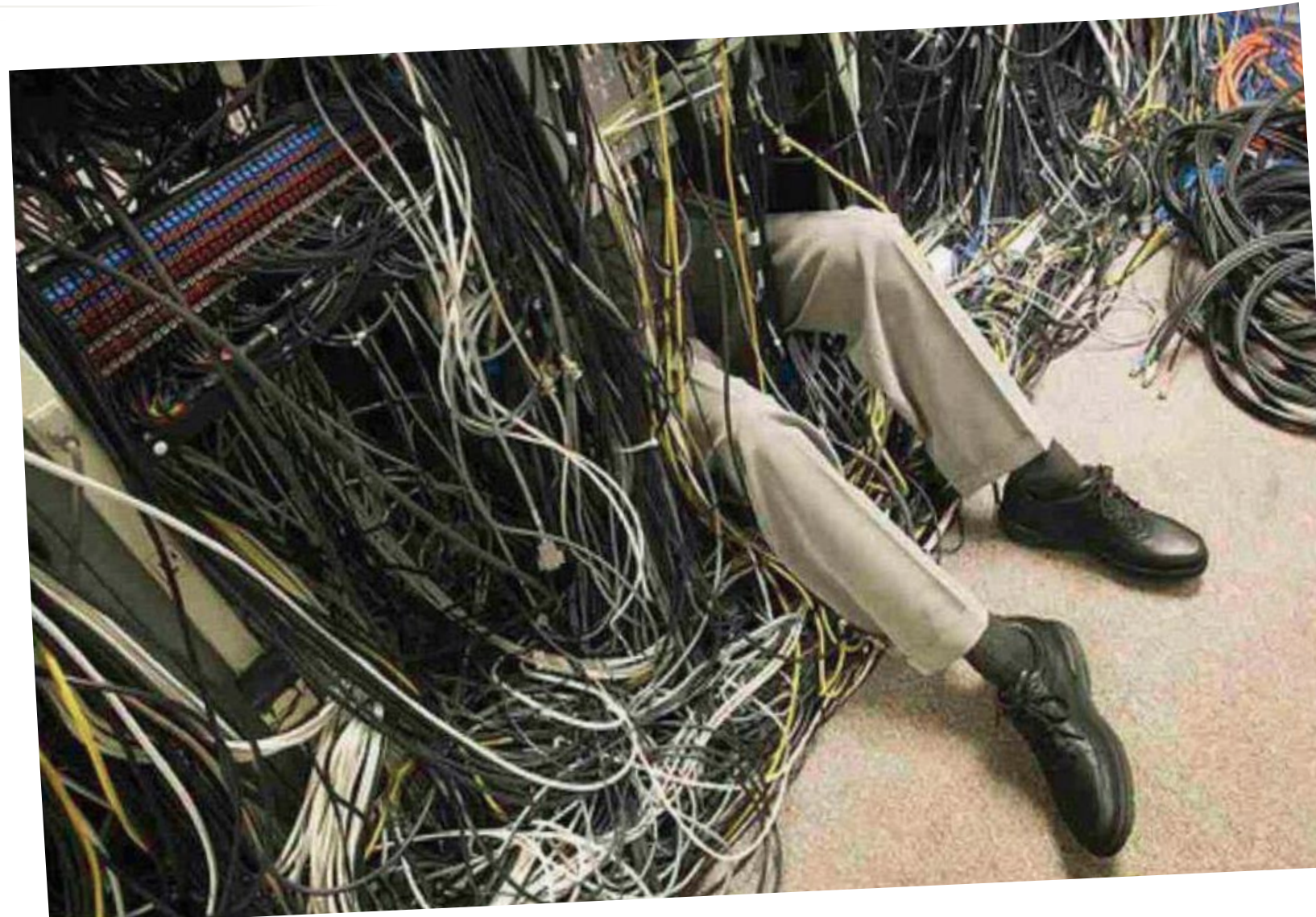
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<http://www.h2020-endeavour.eu>





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