

Some Transport Service Models Between IXP

LACNIC XIII – NAPLA

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The PTTMetro (PTT/IXP - Internet Exchange Point) is the project of the Brazilian Internet Steering Committee (CGI.br) that provides the necessary infrastructure for the direct interconnection between the diverse networks that operate in a metropolitan region.

<http://cgi.br/>

<http://www.cgi.br/internacional/>

<http://ptt.br/>

PTTMetro – Actual Project Covered Cities



1. Belo Horizonte
2. Brasília
3. Campinas
4. Curitiba
5. Florianópolis
6. Fortaleza
7. Londrina
8. Porto Alegre
9. Recife
10. Rio de Janeiro
11. Salvador
12. São Paulo

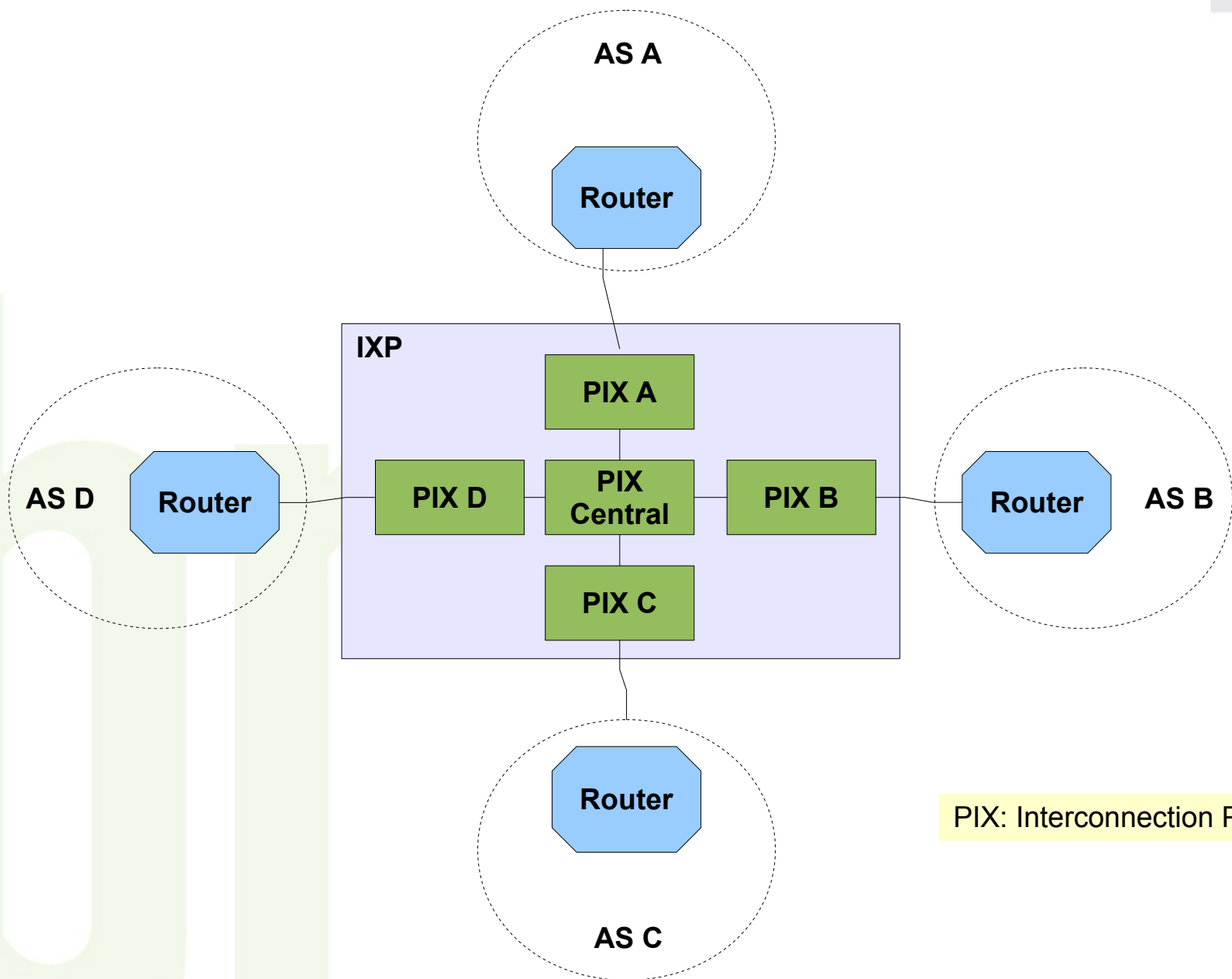
All PTTMetro Locations are Isolated

The main purpose for PTTMetro locations being is to allow the local traffic to stay on its original regional.

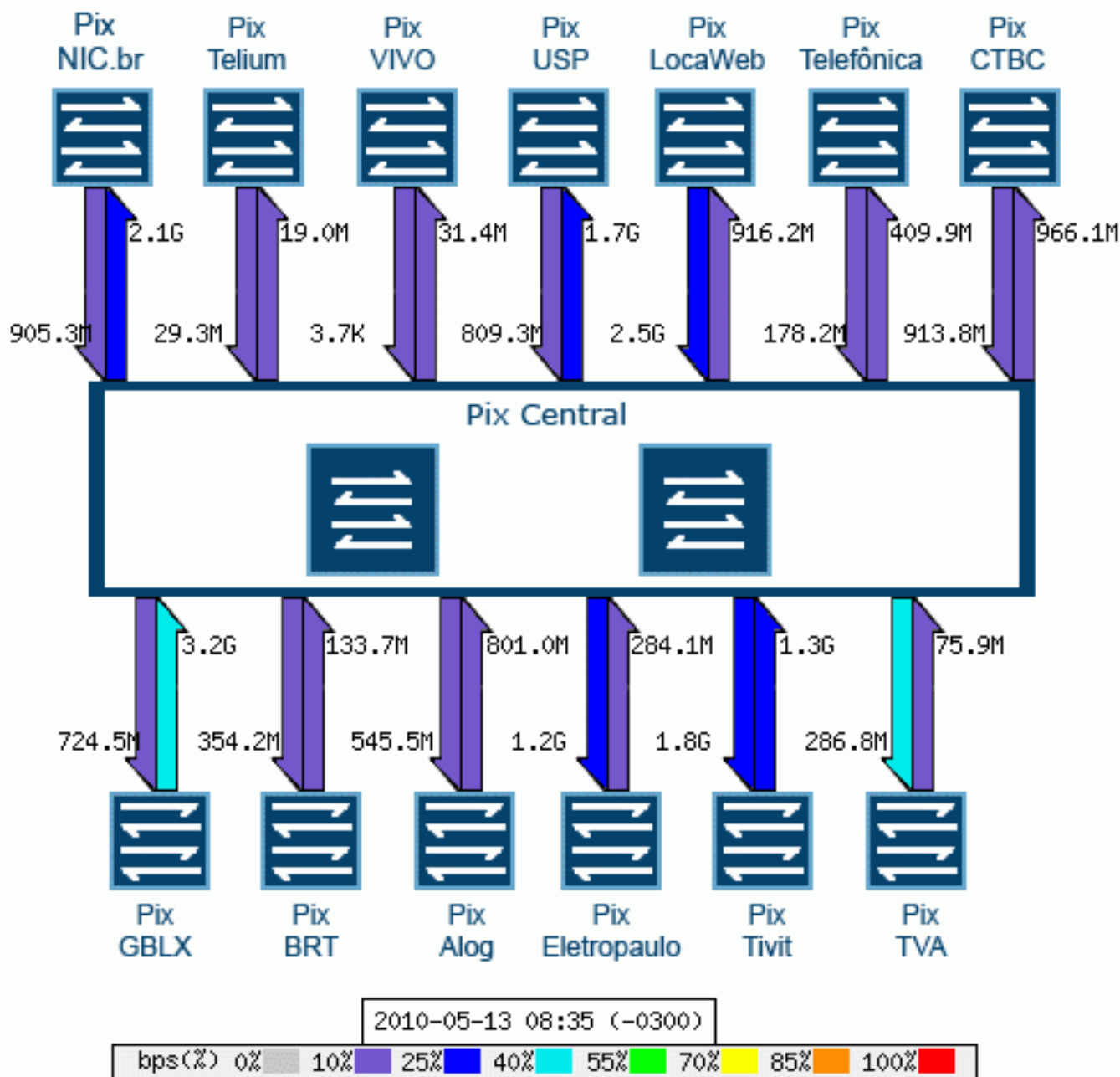
The Brazilian Internet Steering Committee do not intend to interconnect PTTMetro Locations and compete with telecommunications companies.

PTTMetro project stimulates and support inter locations transport services done by participants companies.

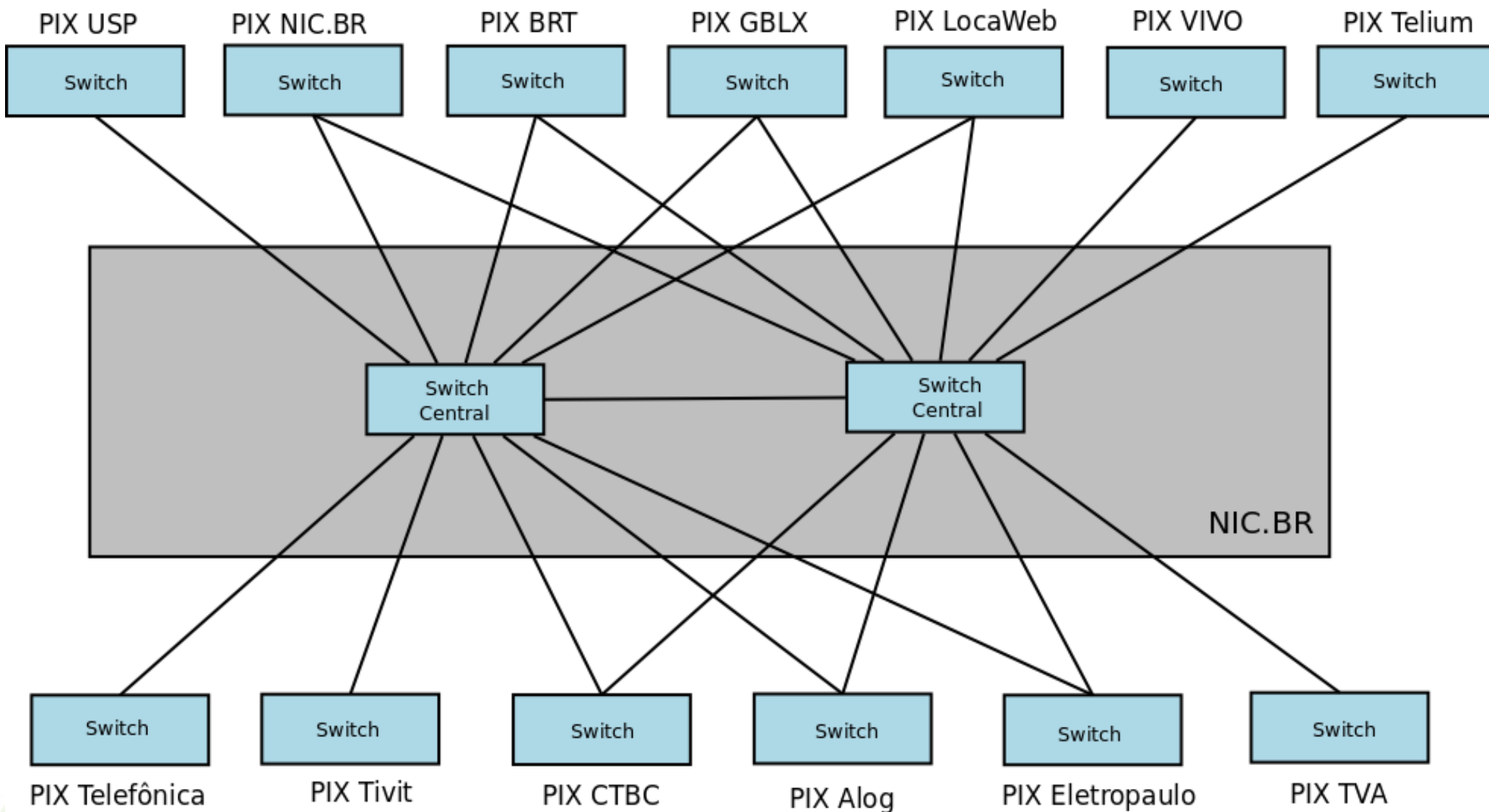
(PTTMetro define some transport modes in order to optimize common resources and reduce costs)



PIX: Interconnection Point



PTTMetro – Structure – São Paulo – Inter-PIX Links



Multi-Lateral Peering Agreements (MLPA)

IP (v4/v6) traffic exchange between all participants.
BGP sessions established between participants and IXP route servers.
Different MLPA VLANs for IPv4 and IPv6.

Bilateral Peering Agreements (BPA)

Shared VLAN Mode

IP traffic exchange only between participants.
Use the same MLPA VLANs.

Dedicated VLAN Mode

IP traffic exchange only between participants (e.g. Internet Transit).
Use a dedicate VLAN for each peering agreement.

PTTMetro uses dedicated VLANs to provide L2 logical isolation between AS for any IP services interconnection.

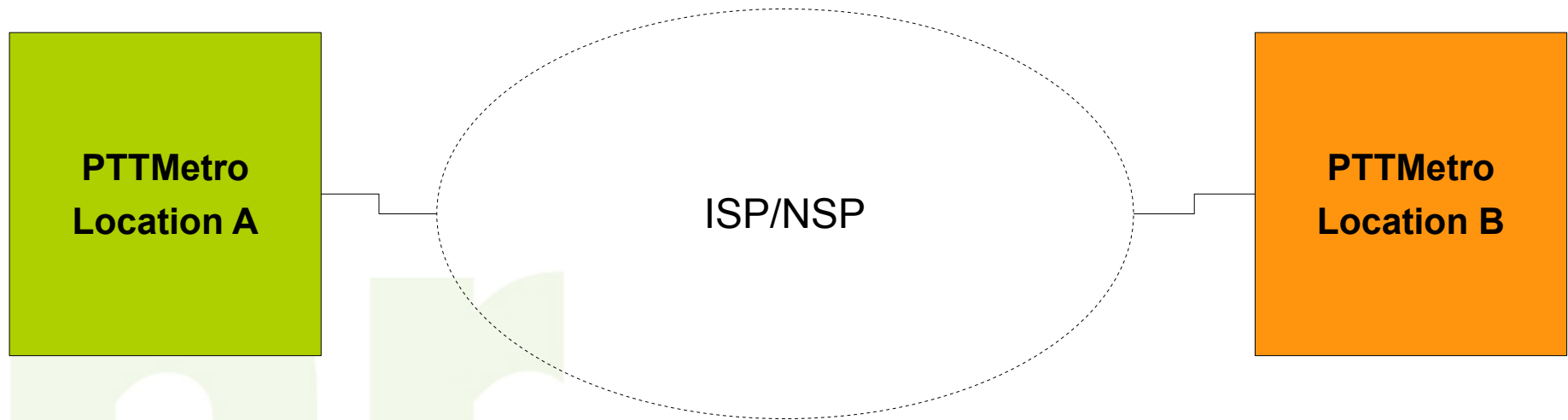
e.g Internet Transit (IPv4 and IPv6), Backup, Storage, VoIP, etc

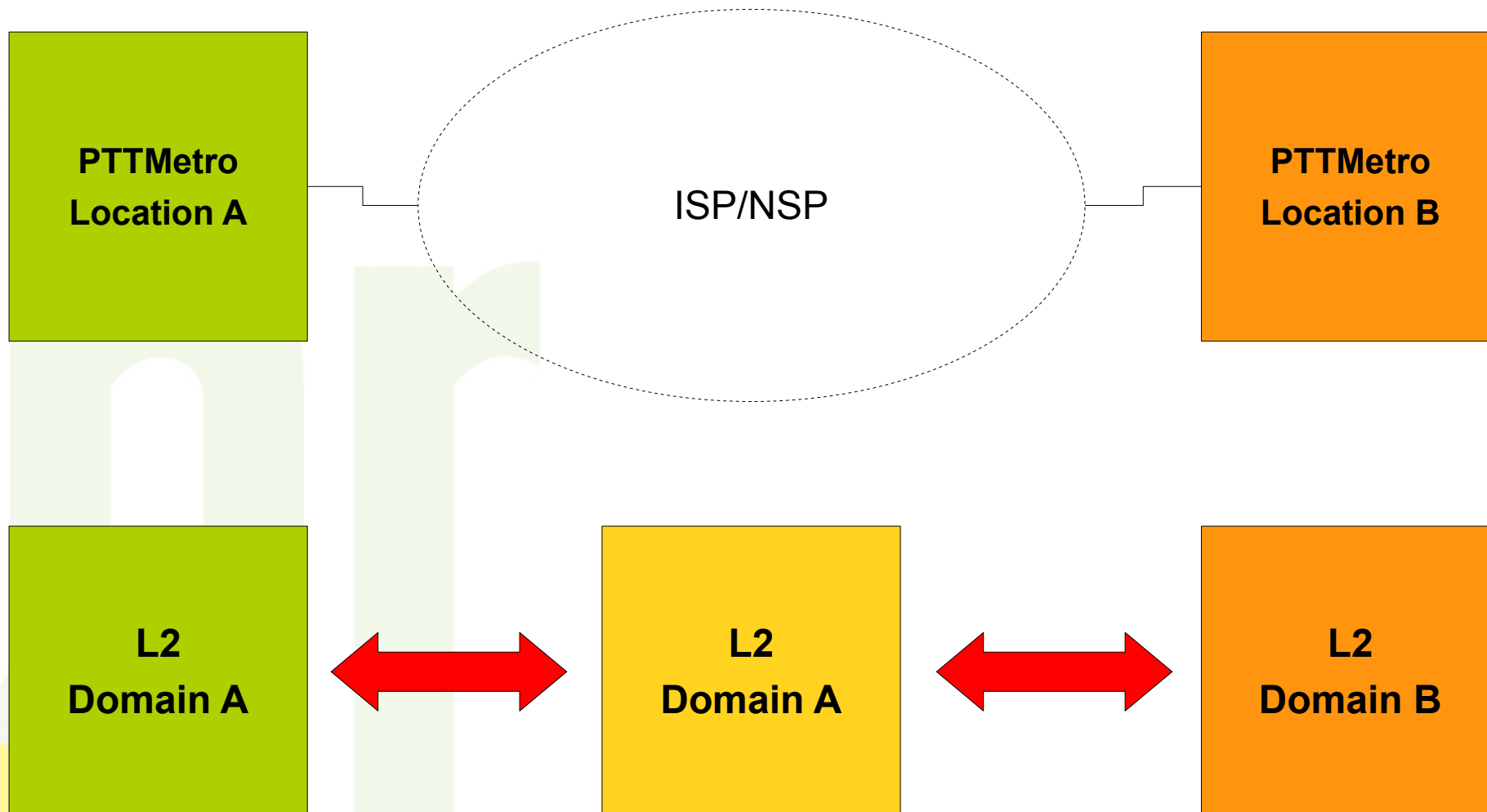
PTTMetro BRAZIL - IXP – Update – LACNICXIII NAPLA

Locations	ASNs	Traffic Peak (day)
Belo Horizonte	4	52 Mbps
Brasília	9	503,7 Mbps
Campinas	12	472,7 Mbps
Curitiba	18	2,29 Gbps
Florianópolis	9	180,9 Mbps
Fortaleza	4	16,2 Mbps
Londrina	10	351,6 Mbps
Porto Alegre	27	1,17 Gbps
Recife	4	30,4 Mbps
Rio de Janeiro	14	383,2 Mbps
Salvador	6	63,7 Mbps
São Paulo	110	26,6 Gbps

Actual values

- New demand for AS to participate in more than one PTTMetro location.
- Normally the AS connects to a PTTMetro location near to its area of operation and to another location of great interesting (e.g. São Paulo)

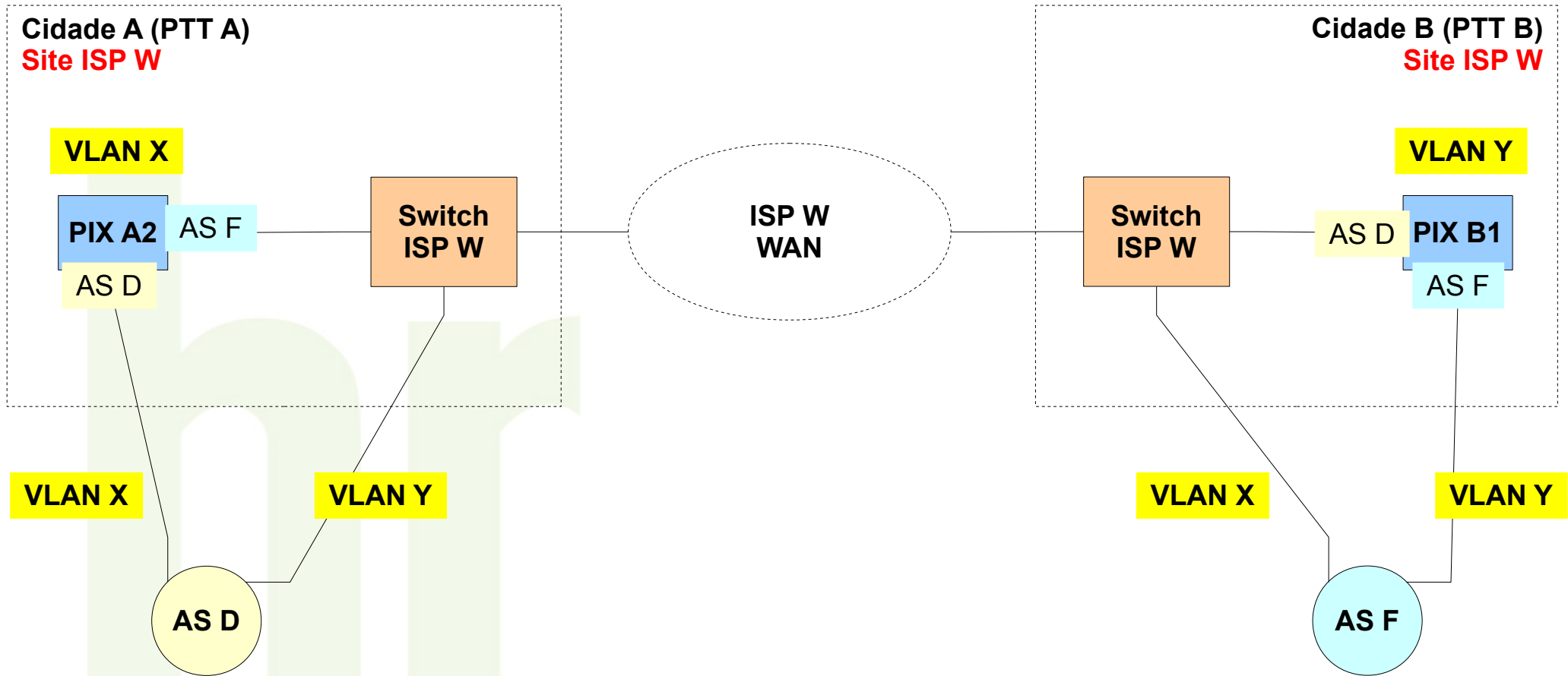




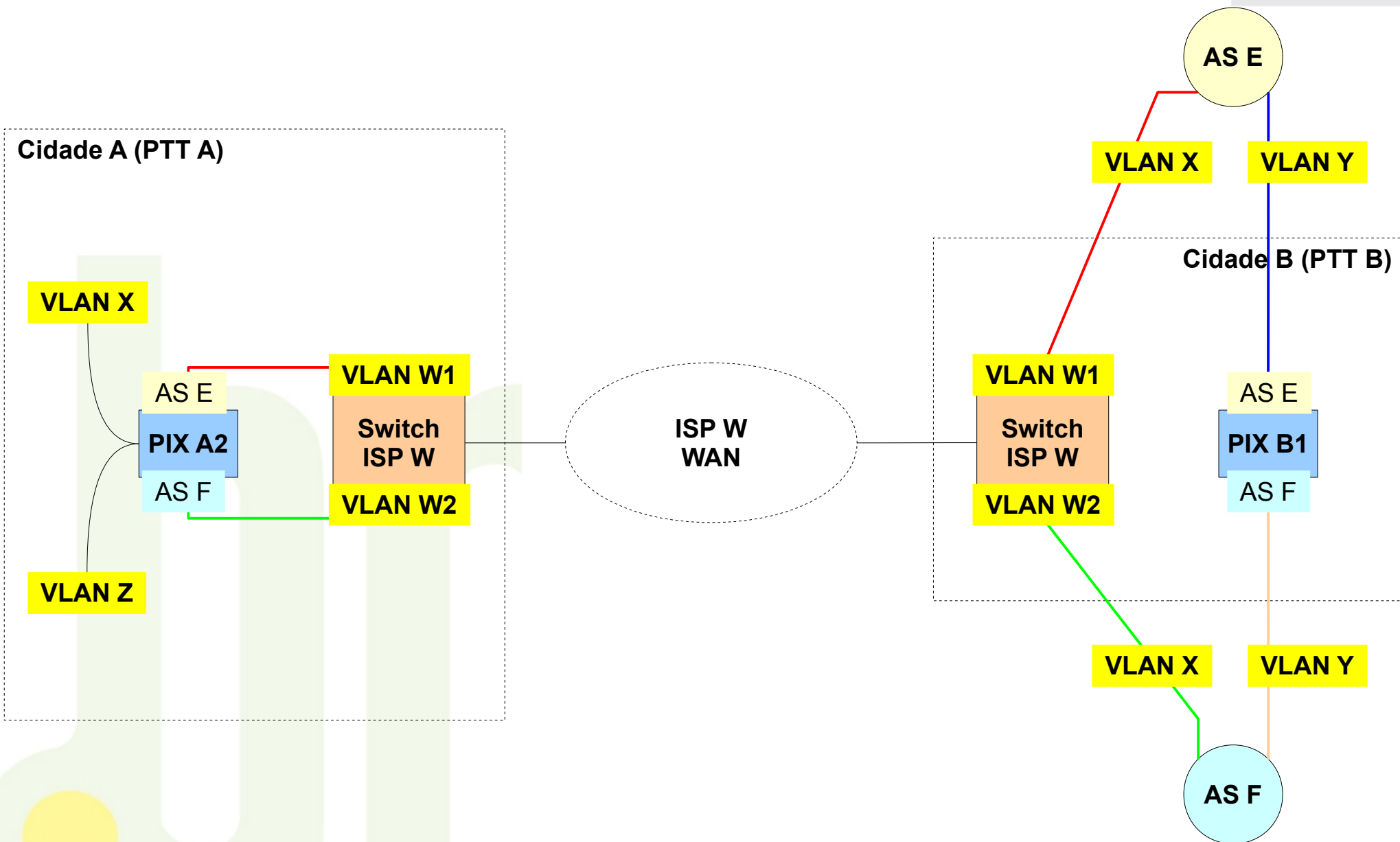
Some Interconnection Models Considerations

There are technical reasons to keep PTTMetro locations isolated and at the same time allow ISP/NSP to provide efficient, controlled and secure transport service between locations.

Way to optimise resources and reduce costs.

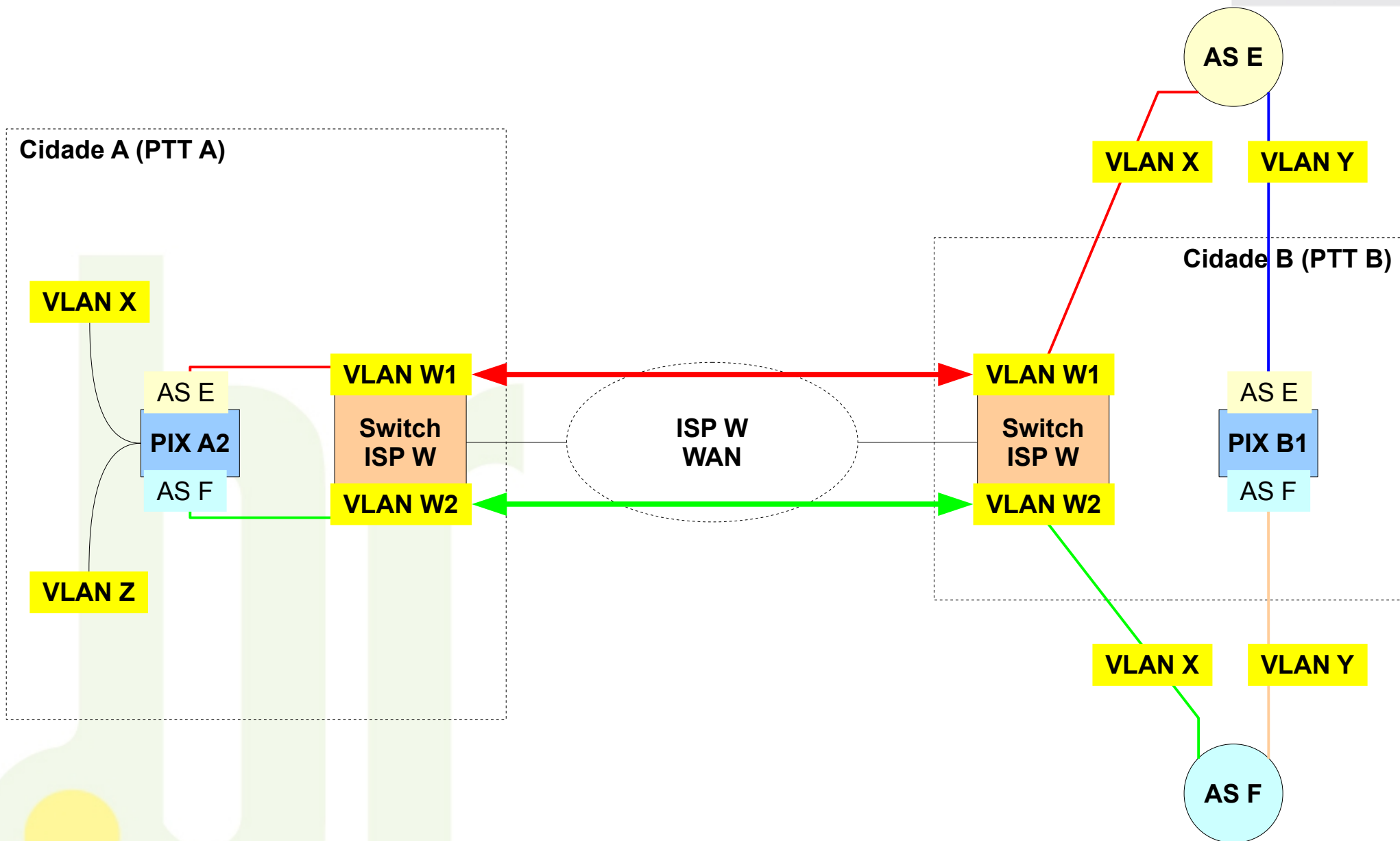


PTTMetro - Model 1 - AS Independently connected to Multiple Locations



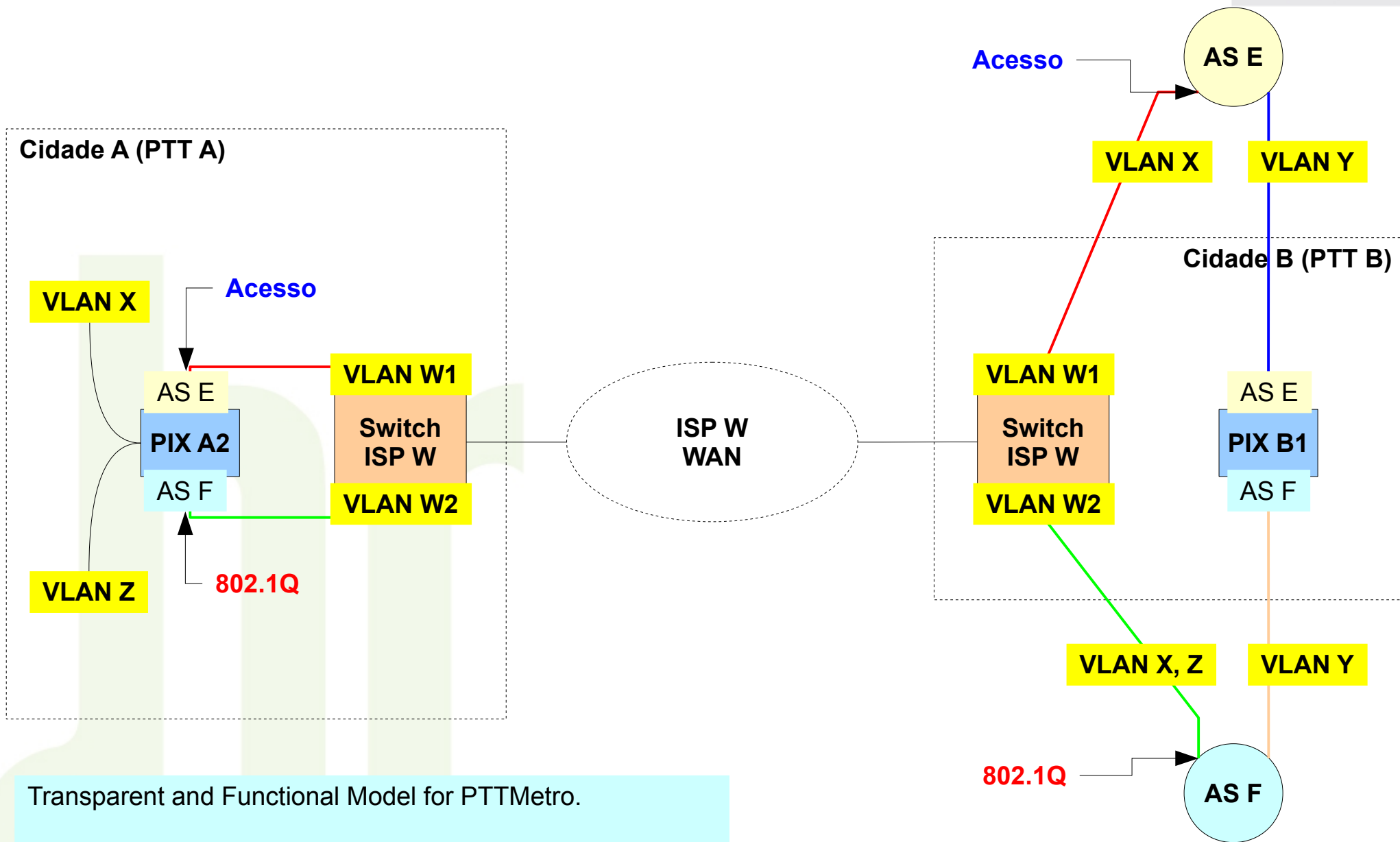
ISP W may be PIX on both locations, which will probably help to reduce costs related to transport service.

PTTMetro - Model 1 - AS Independently connected to Multiple Locations



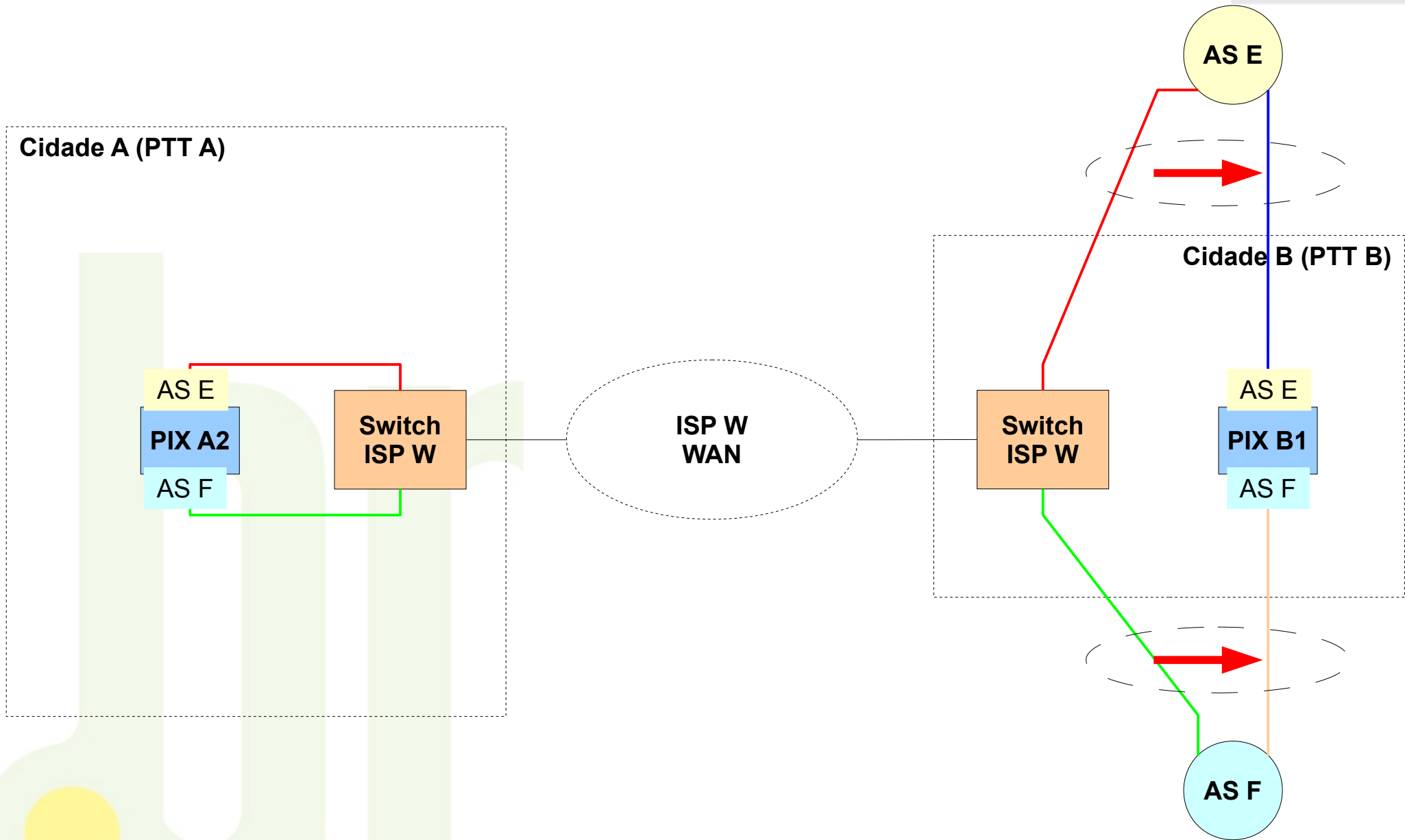
ISP W provide logical isolation on long distance links for AS E and F to PIX A2 (e.g. QinQ - 802.1ad)

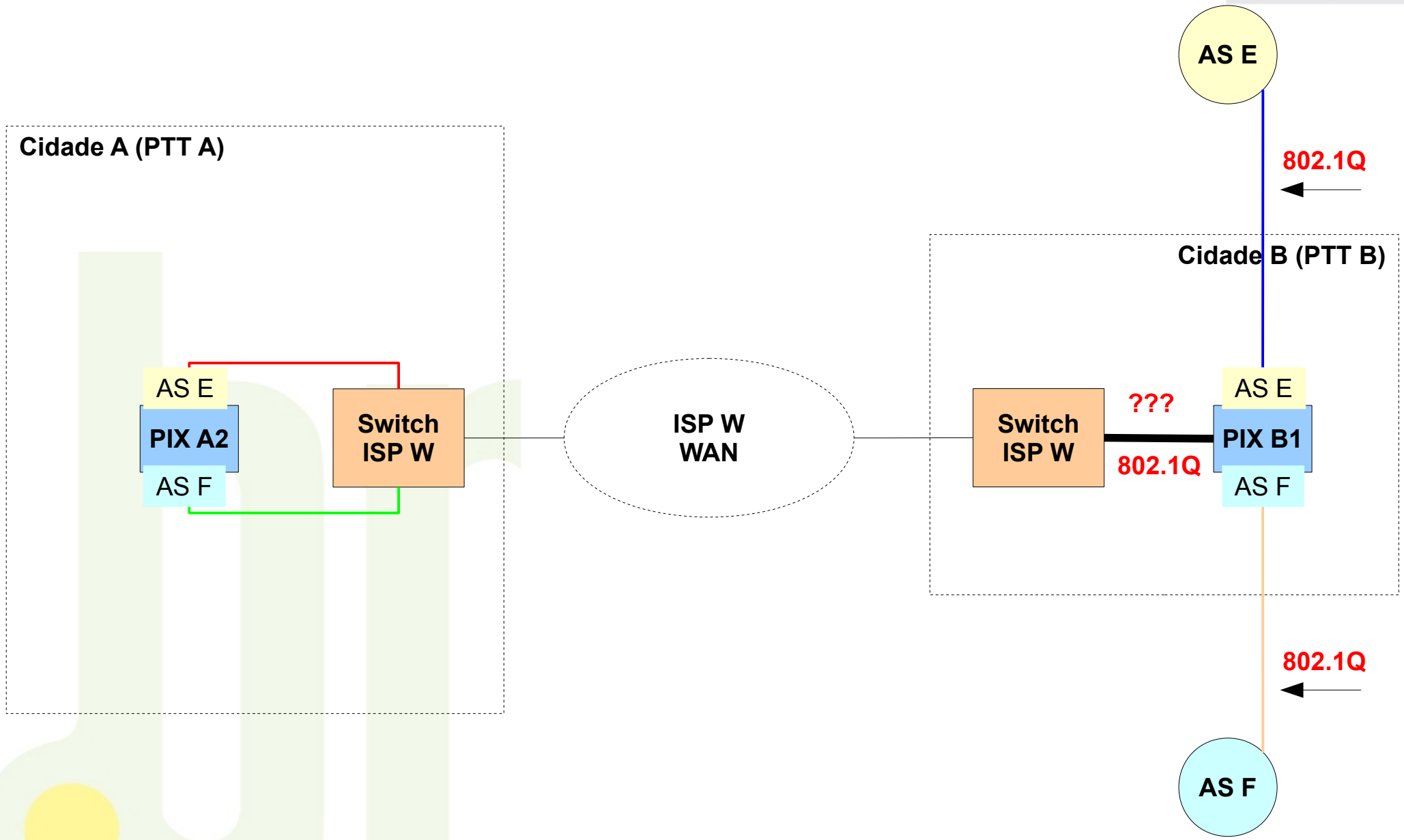
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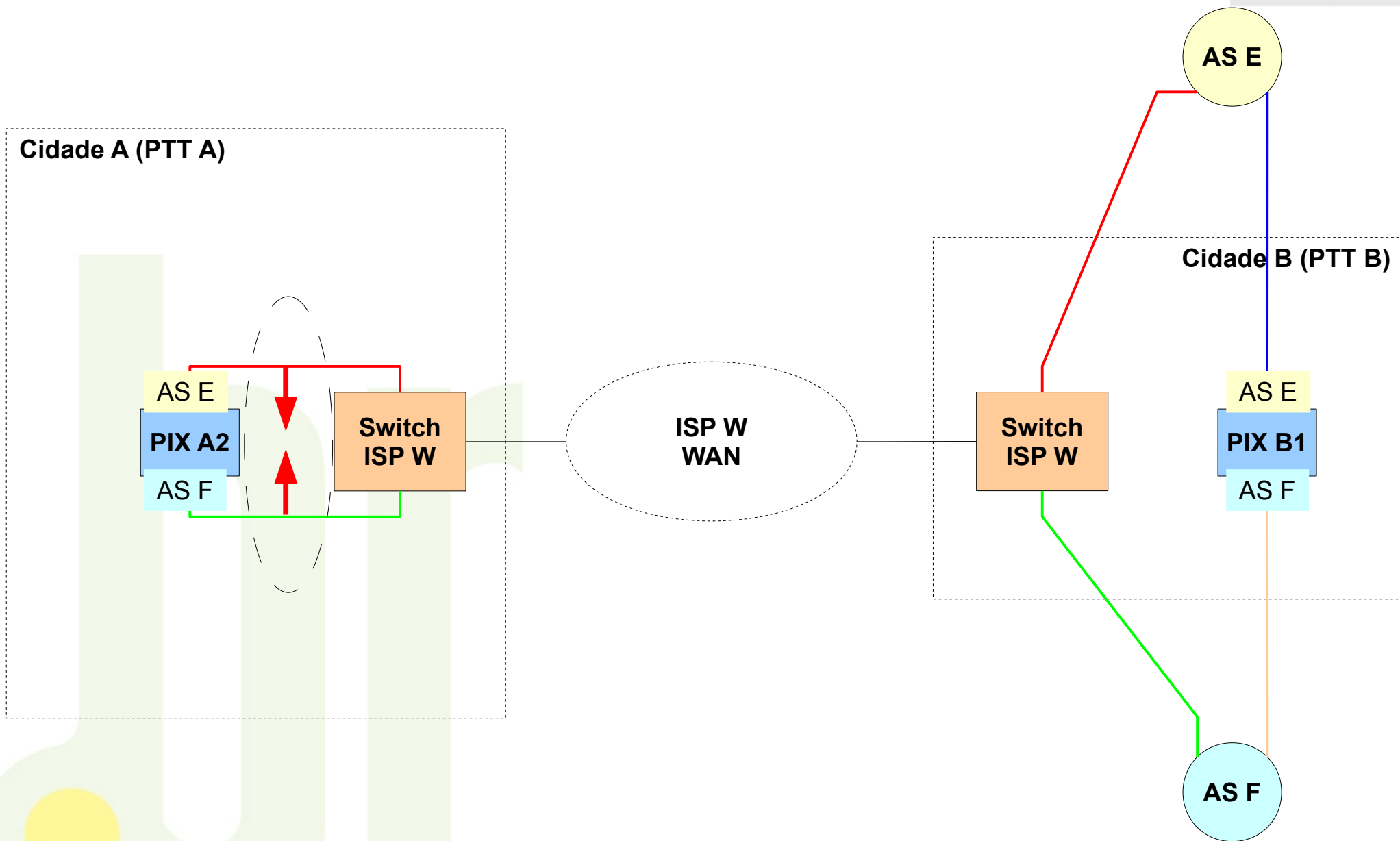


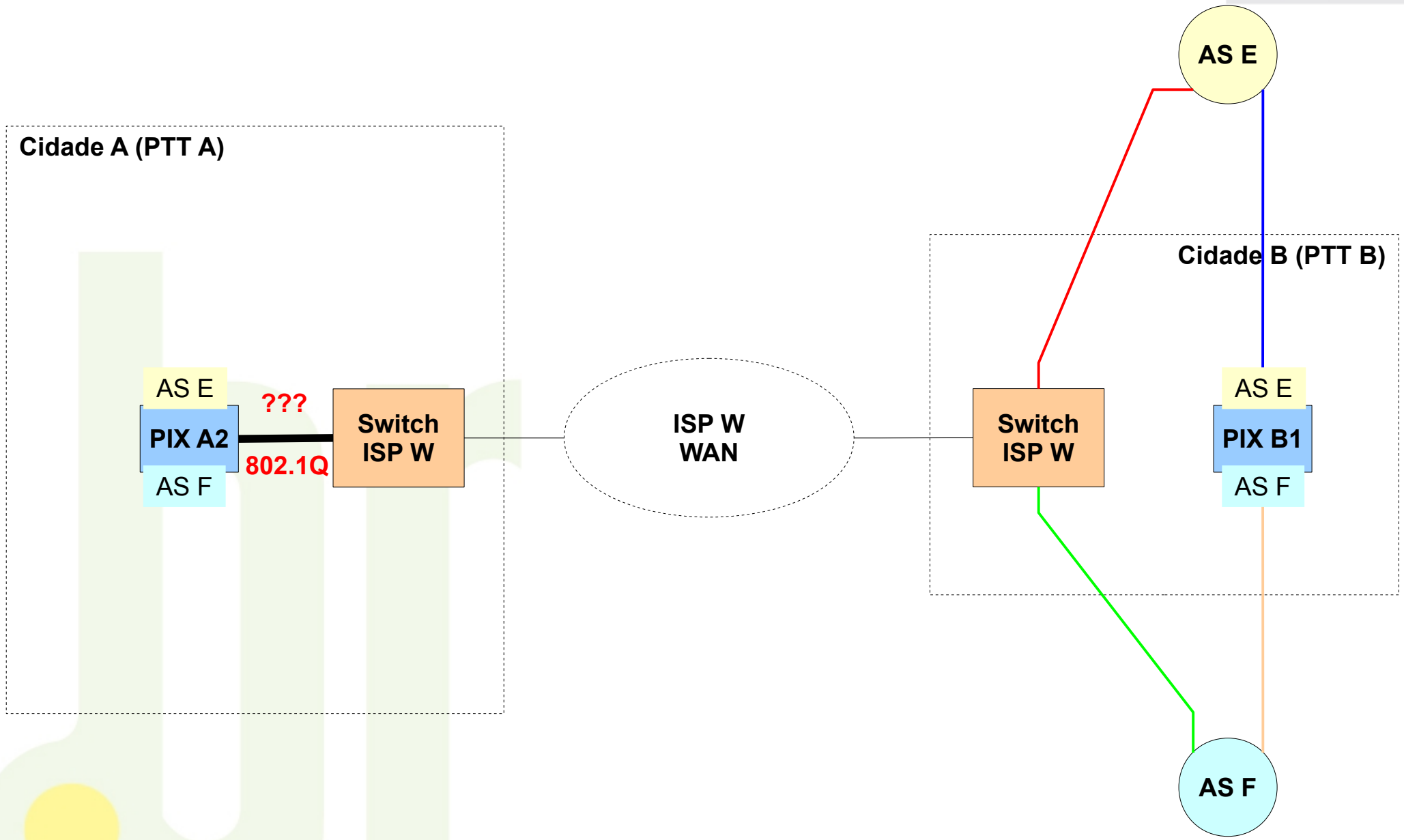
Transparent and Functional Model for PTTMetro.
Each participant hire both links to local and remote locations.

- Keep initial PTTMetro Project Requirements
(NSP/ISP links to PTTMetro to Keep Logical Isolation, etc)
- Reduce NSP/ISP investments by customers/services aggregation.
- Reduce costs for IXP PTTMetro Participants

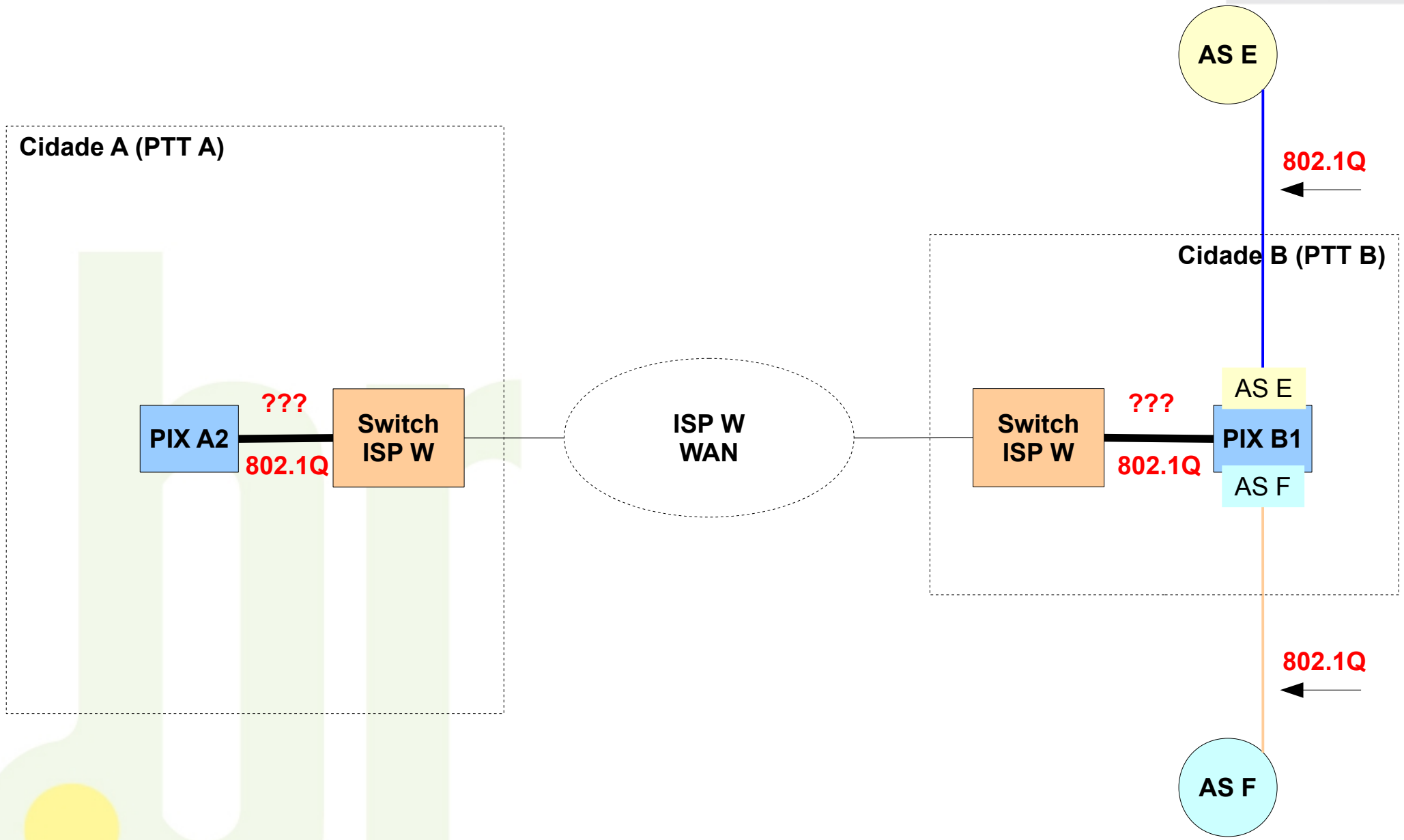




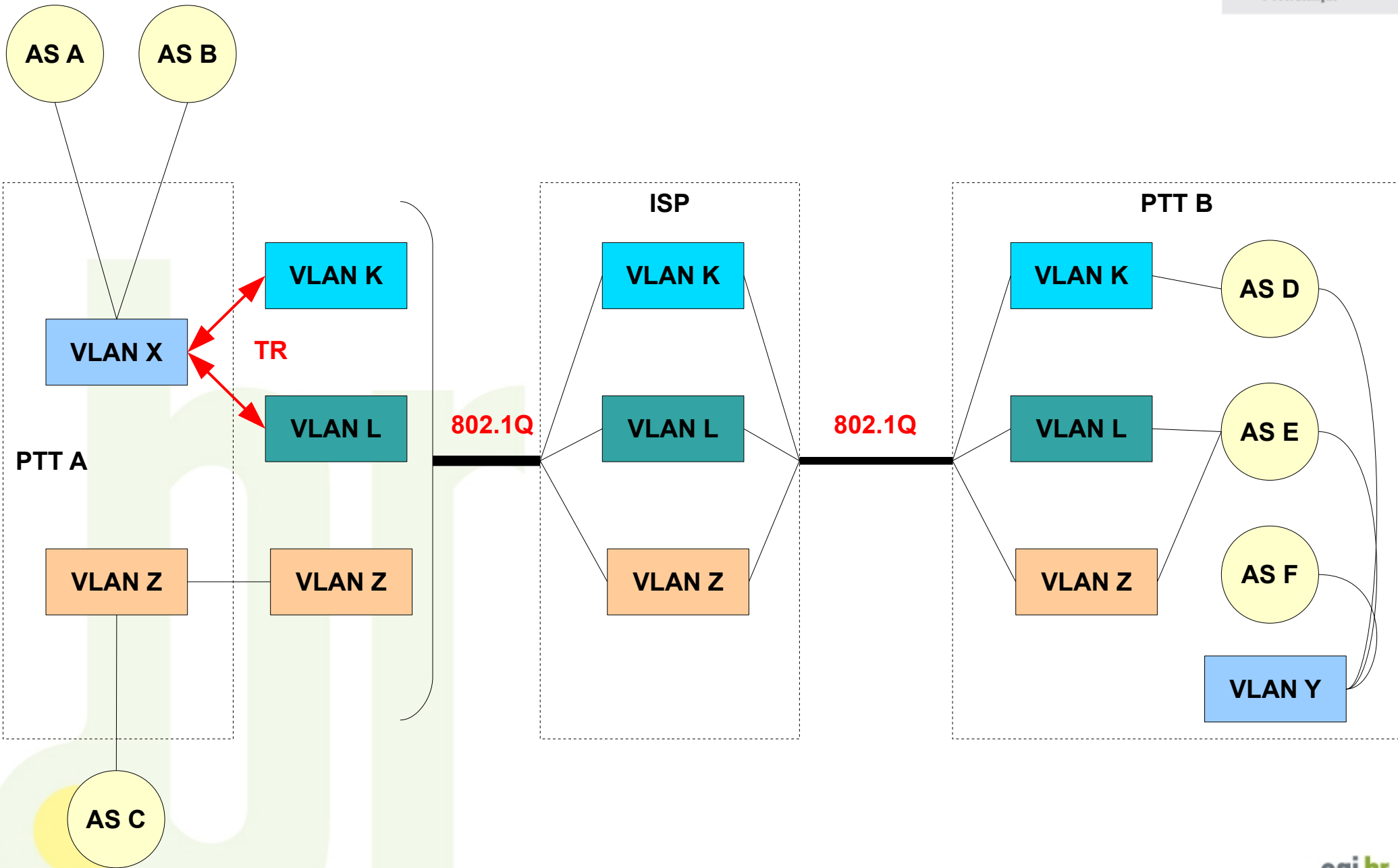




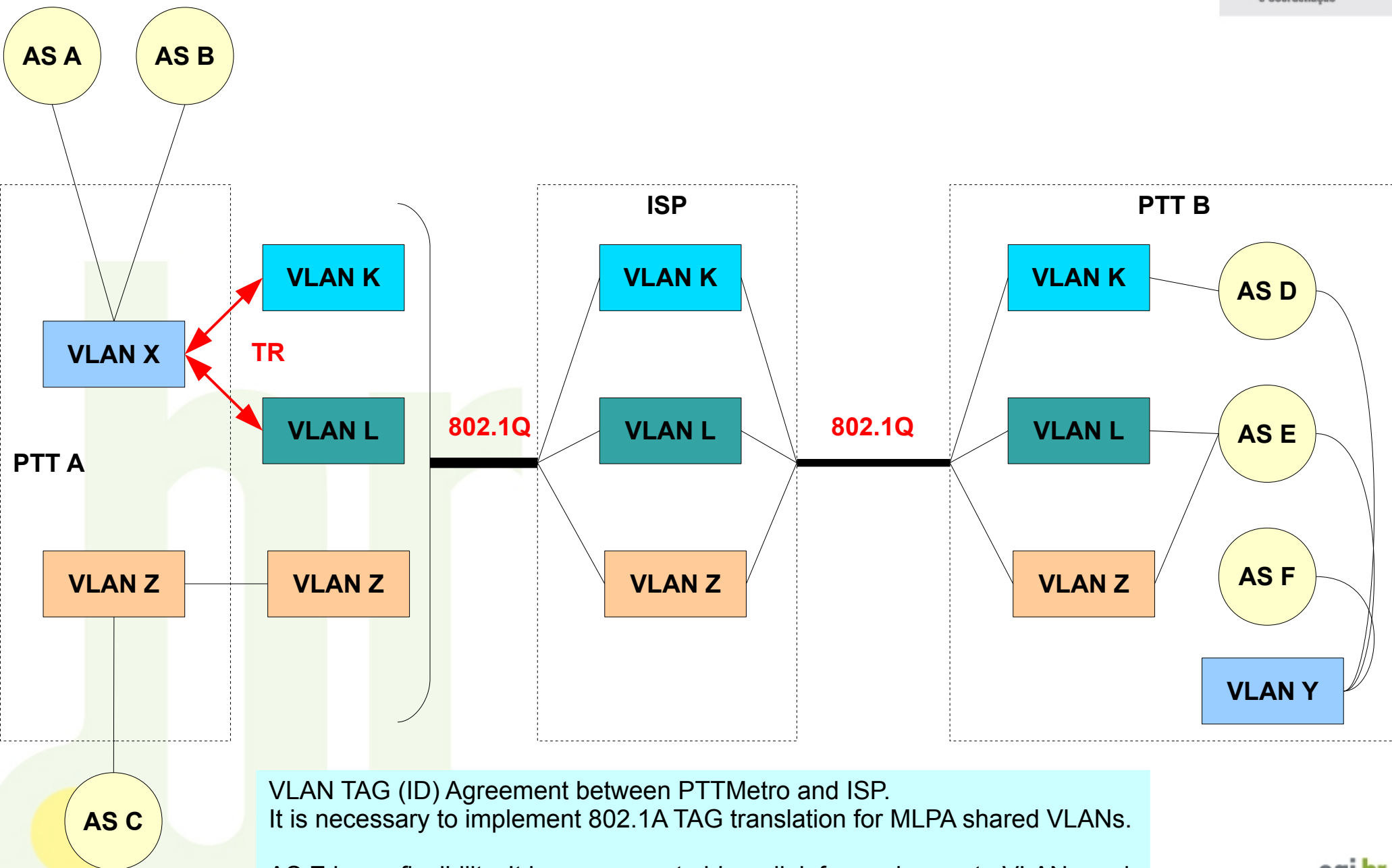
PTTMetro – Double Optimisation – Access and Destination Aggregation



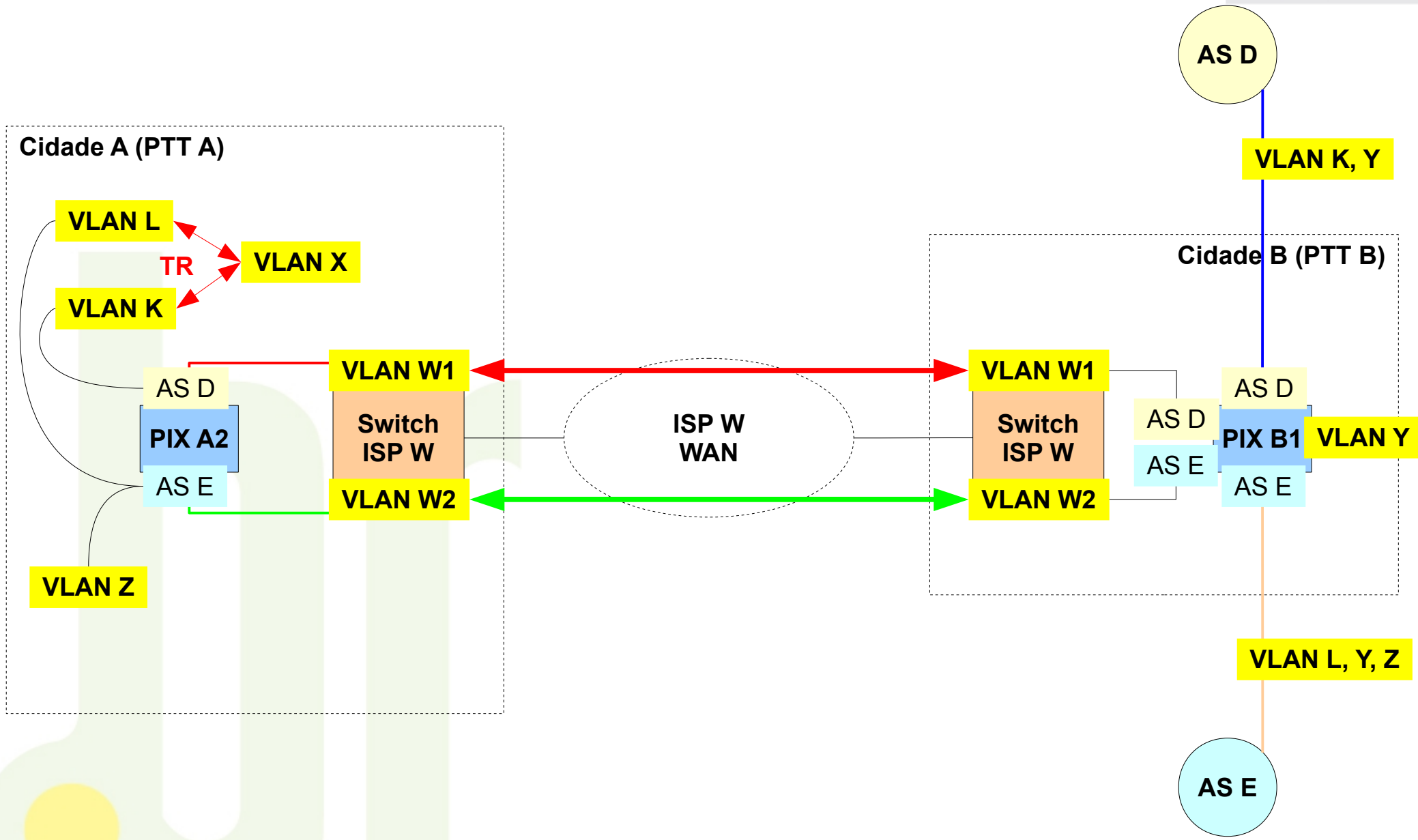
PTTMetro – Model 2 - Double Optimisation Logical Diagram

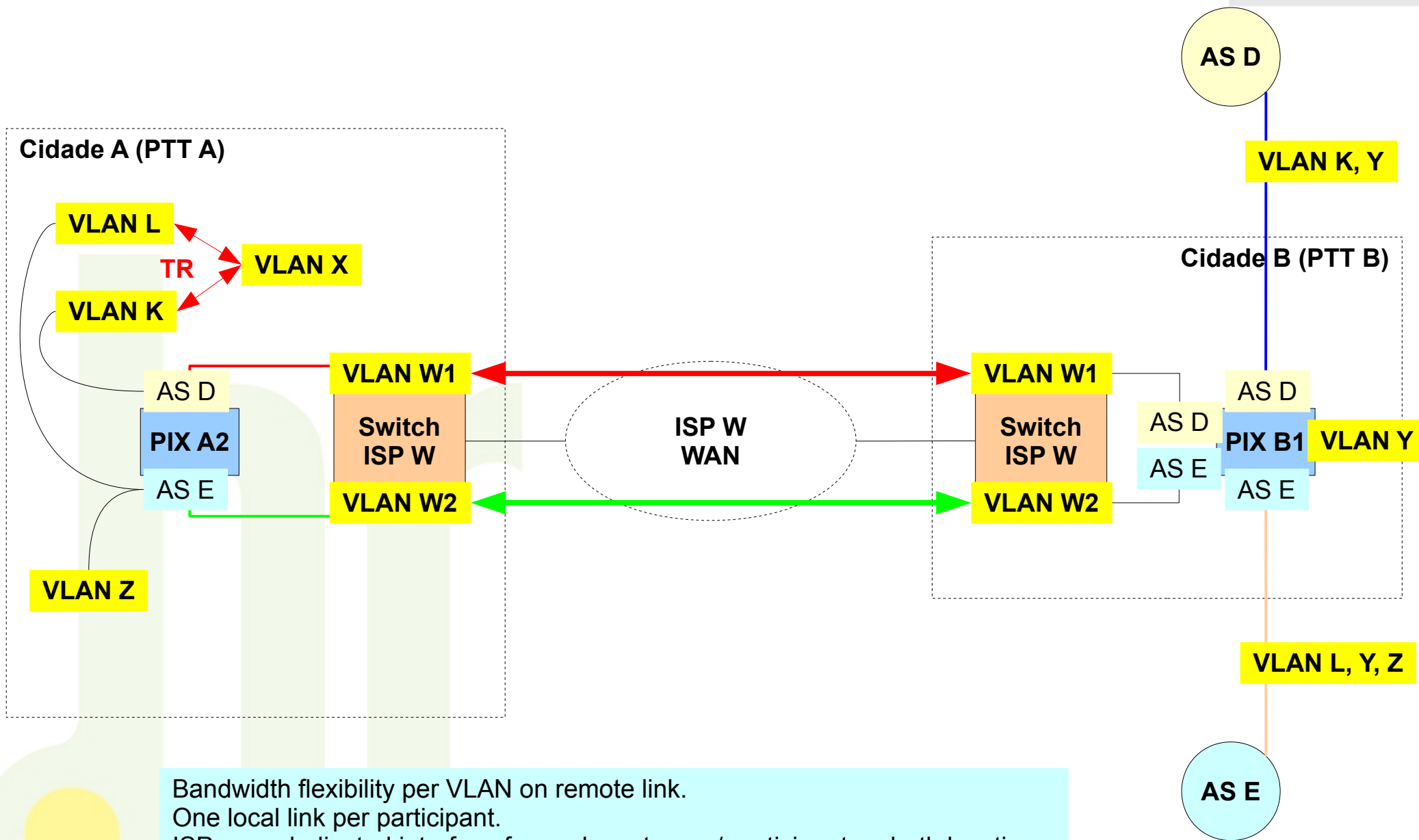


PTTMetro – Model 2 - Double Optimisation Logical Diagram

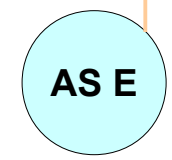


VLAN TAG (ID) Agreement between PTTMetro and ISP.
It is necessary to implement 802.1A TAG translation for MLPA shared VLANs.
AS E loose flexibility. It is necessary to hire a link for each remote VLAN used.

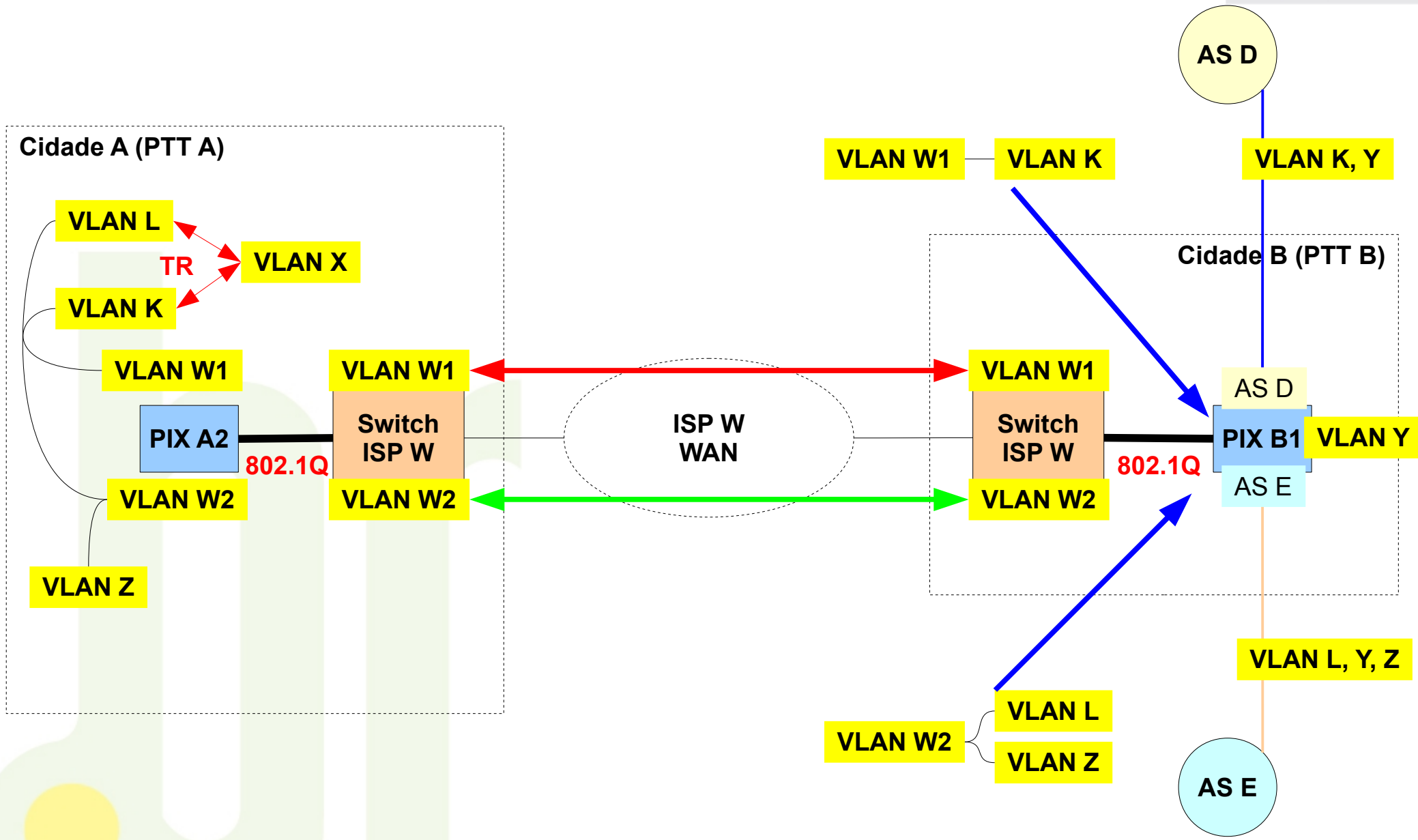




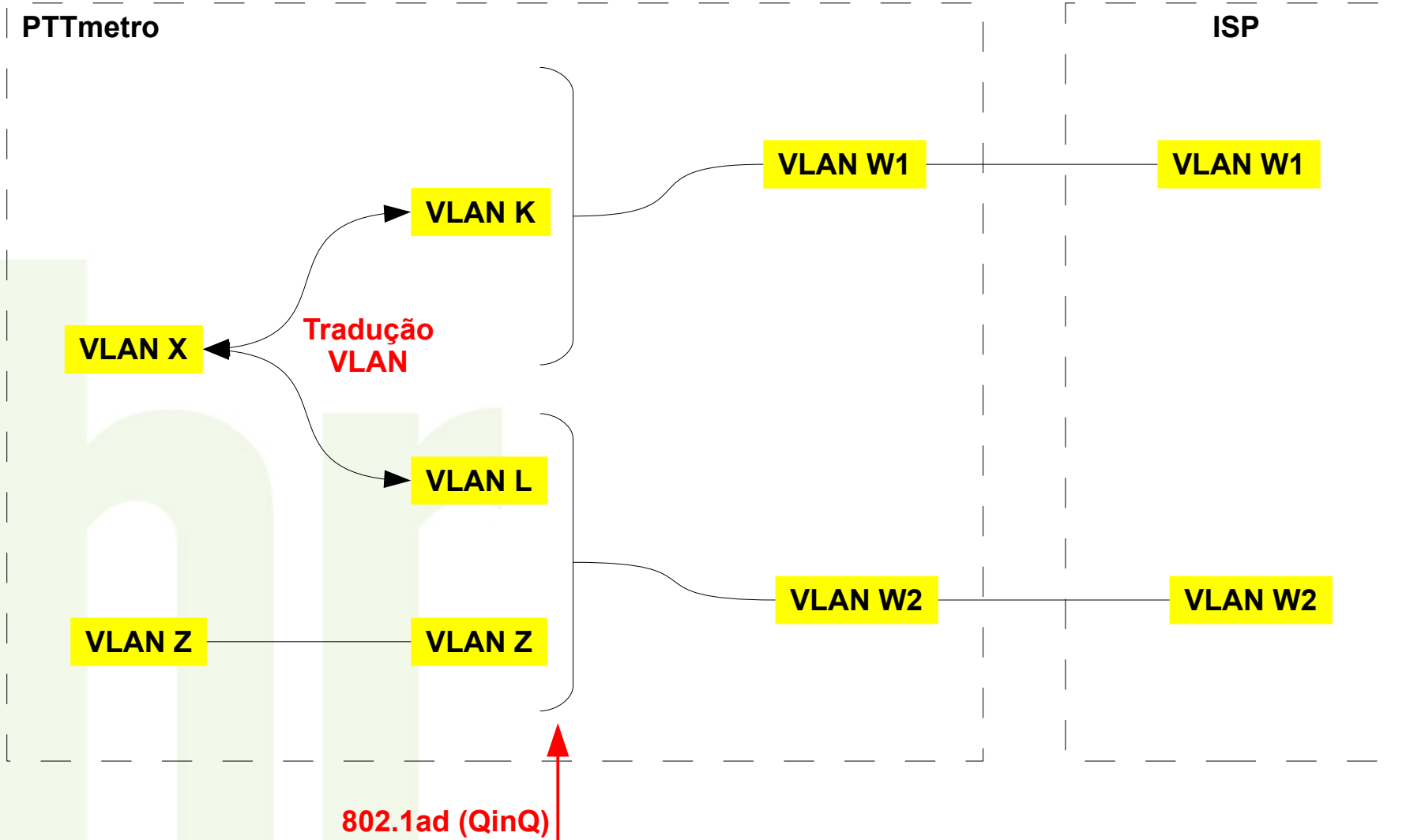
Bandwidth flexibility per VLAN on remote link.
 One local link per participant.
 ISP uses dedicated interface for each customer / participant on both locations.
 ISP can reduce costs by being PIX..



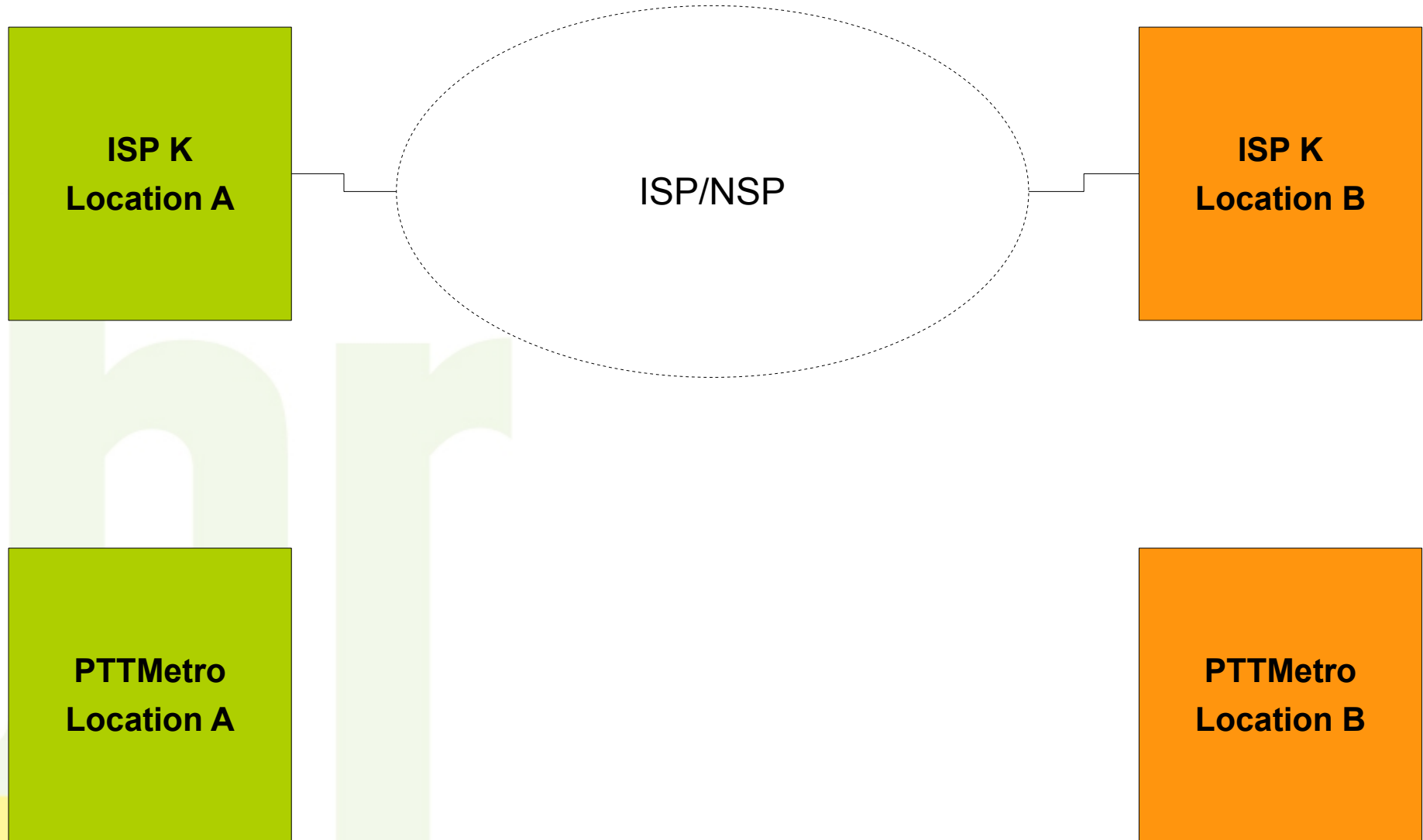
PTTMetro – Model 4 - Double Optimisation (E-NNI)

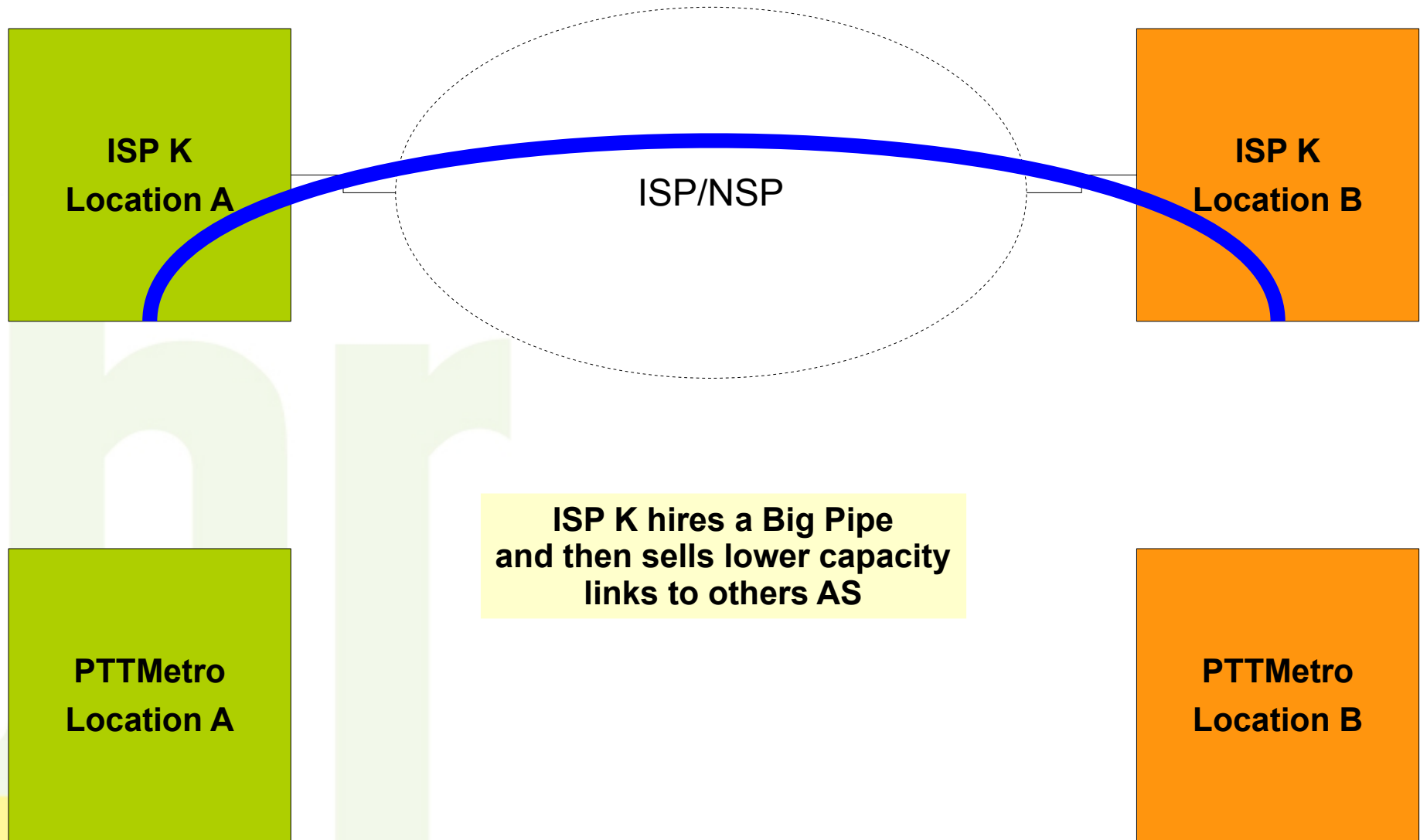


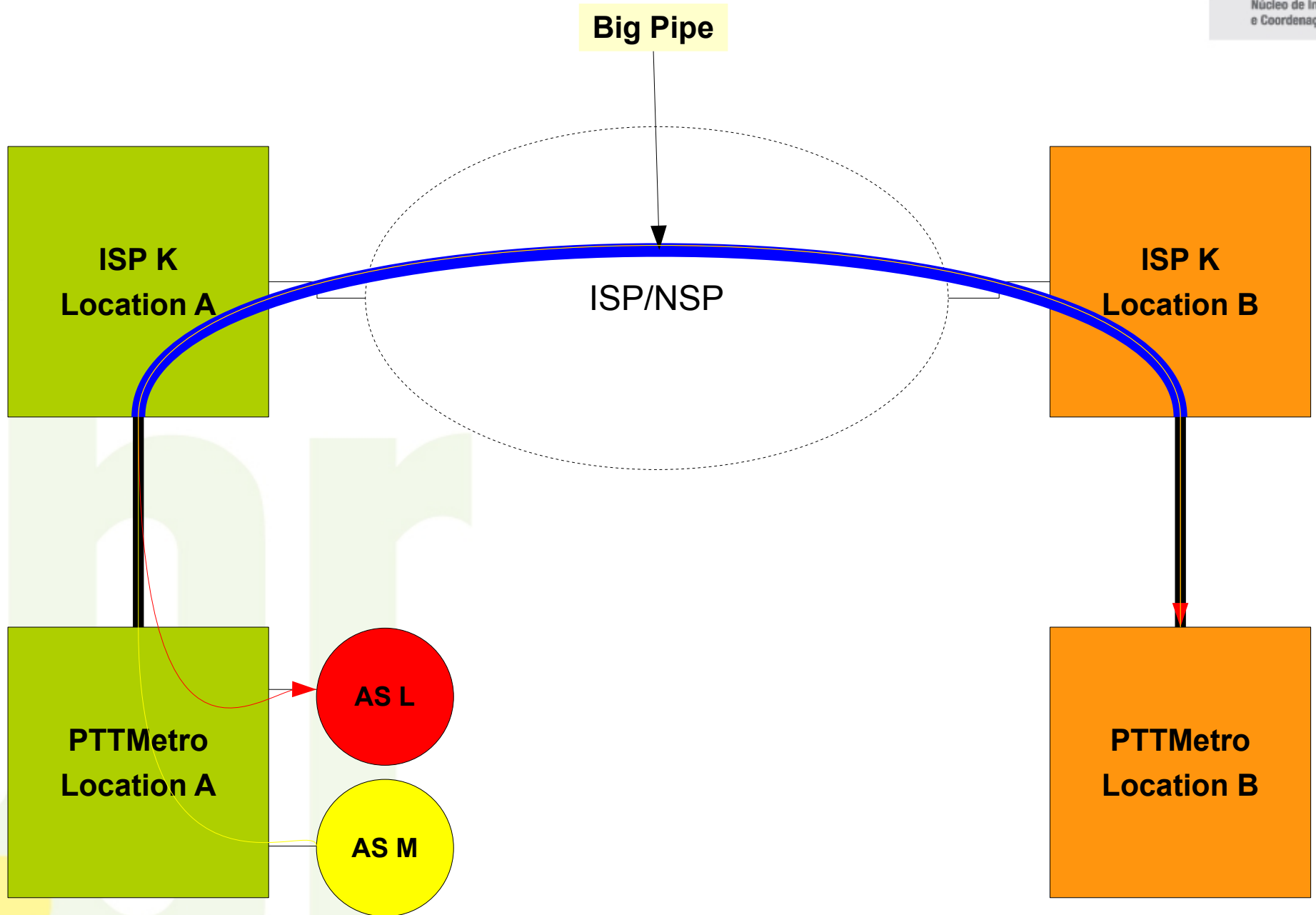
E-NNI: External Network to Network Interface - MEF: Metro Ethernet Forum

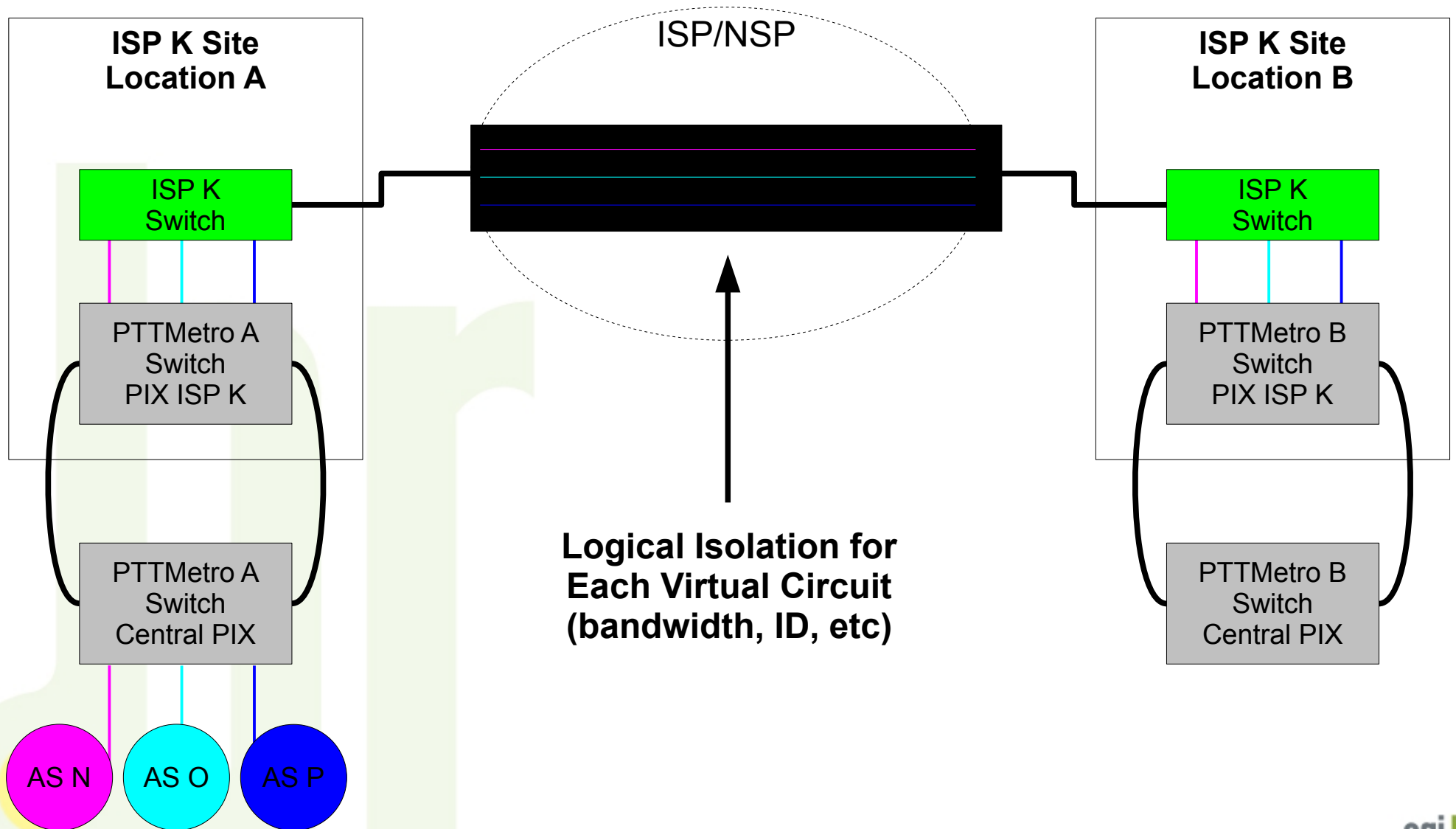


PTTMetro and ISP must have a trusty relationship.
ISP allow PTTmetro to create Ethernet frame (QinQ) with your metro TAG.

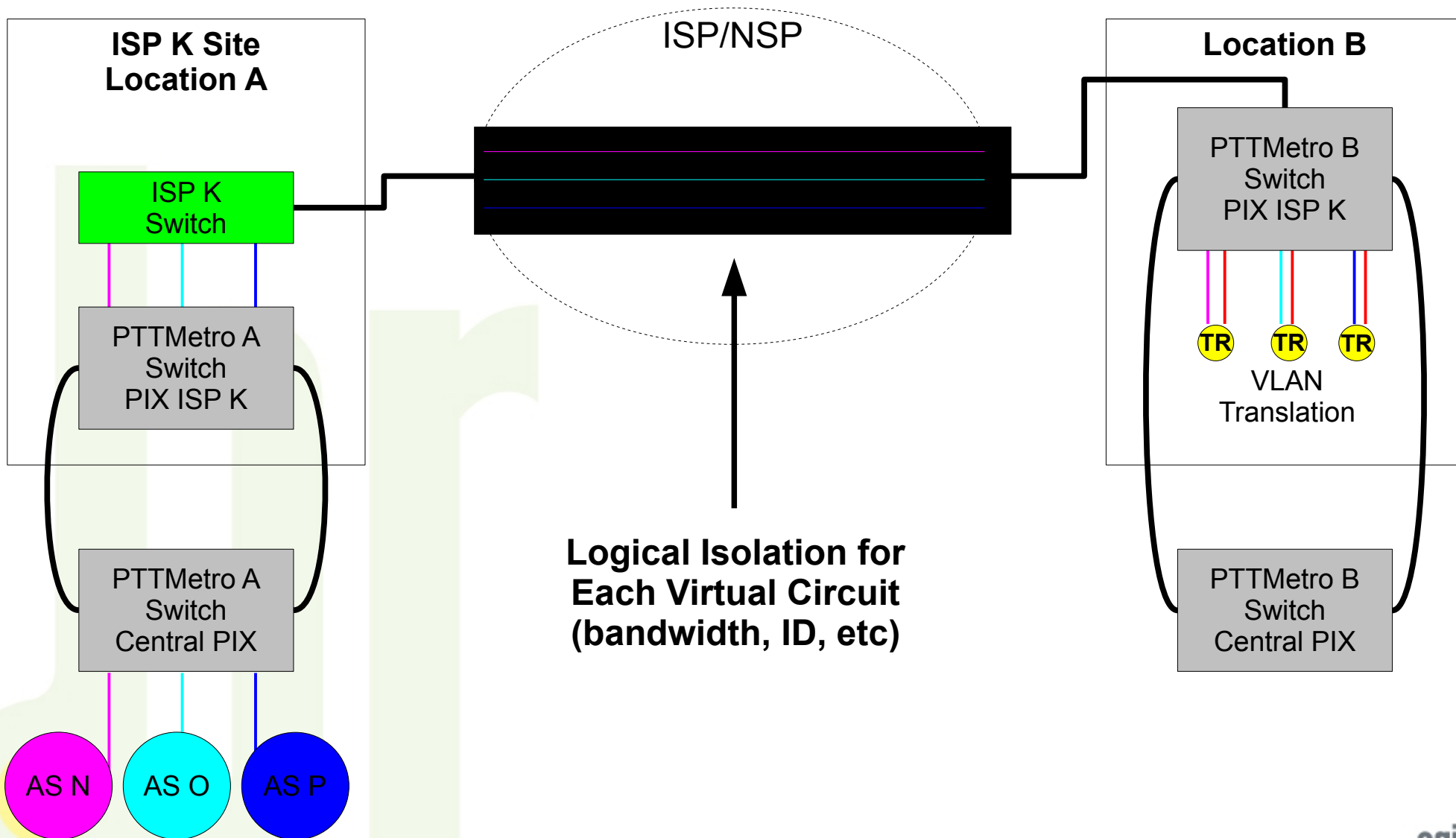








PTTMetro – Model I2. Intermediary ISP Hosts PIX on Only One Location



- L2 logical isolation for each customer link and VLANs (802.1Q) transparent support (Pseudo-wire, QinQ - 802.1ad)
- Number of MAC address allowed from both link sides.
- MTU that can support additional payload (Ethernet over IP, MPLS over IP, etc) e.g. 1530 bytes for EoMPLS
- Individual Customers Bandwidth Capable Controlling Mechanisms

LACNIC XIII – NAPLA 2010 - PTTMetro BRAZIL - IXP – Update
Antonio Galvão de Rezende

LACNIC XII – NAPLA 2009 - Some Considerations About IXP Customers Connection Models
http://lacnic.net/documentos/lacnicxii/presentaciones/napla/06_Eduardo_Ascenco_Reis.pdf

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