



Case Study

ISP – IPv6 Backbone Deployment

About me

- IT Strategy Consultant
 - Network & Systems, focus on automation
 - Team Coaching/Building
 - Application development
- Strong technical knowledge in IP networks
- Over 15 years in Information technology
- Co-founder & board member of Devantis SA
- Co-founder & CTO of ISP Solutions SA
- Technical advisor for 2 system integrators (co-founded 1 of them)
- « Open ... » and « SDx » enthusiast

Context

- Small ISP in french speaking part of Switzerland
- 5 site
 - 4 POP
 - 2 Datacenter (one DC including a POP)
- ~ 80 Datacenter customers
- ~ 12'000 access customers
 - 70% private
 - 30% business
- Over 10 year old network devices

Goal of the project

- Renew the network equipment
 - For the next 10 years
 - Including IPv4 and IPv6
- Deploy a « future proof » infrastructure
- FTTx readiness



Process

- Training for network staff
- Build a LAB and test, test, test, test, ... (do not forget to document the findings)
- Documentation
 - Address & Security concept
 - Migration scenario
 - Monitoring
- Backbone deployment / Network services deployment (DNS)
- Test
- Customer information
- Migration of the customers

The reason for IPv6

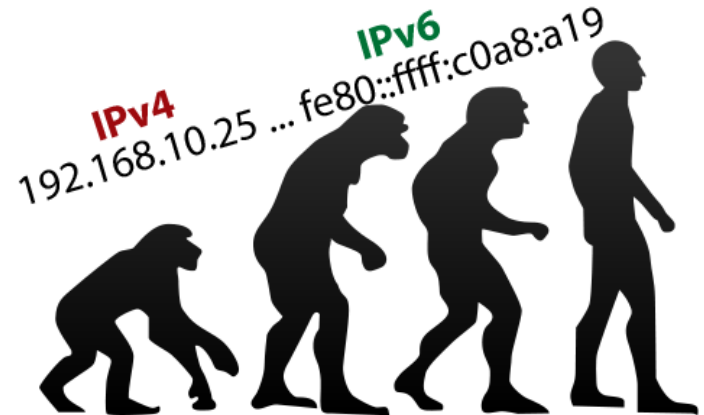
- Business Continuity
 - No more end to end connectivity with all part of the Internet
- Customer requirement
 - Some customers asked for
- Number of available IP Address
- Not willing to implement Carrier Grade NAT

Dual Stack or IPv6 Only ?

- The case for IPv6 Only
 - Less IPv4 Address used
 - Need to tunnel IPv4 over IPv6 (more complexity)
- The case for Dual Stack
 - IPv4 savings quite small
 - No need for tunnels (less complexity)
 - The failure of one protocol does not impact the other one

LAB

- Include the vendors in the test
- Document findings
- Test all possible scenarios
- Monitoring
- Test network services
 - DNS
 - Reverse DNS



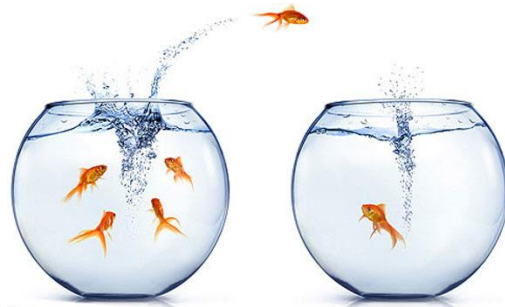
Customer information

- Newsletter during the whole project
- « Info-Apero » to catch customer questions
- Special information for demanding customers
 - This generated followup projects to implement IPv6 for the customers
- A lot of positive feed-back

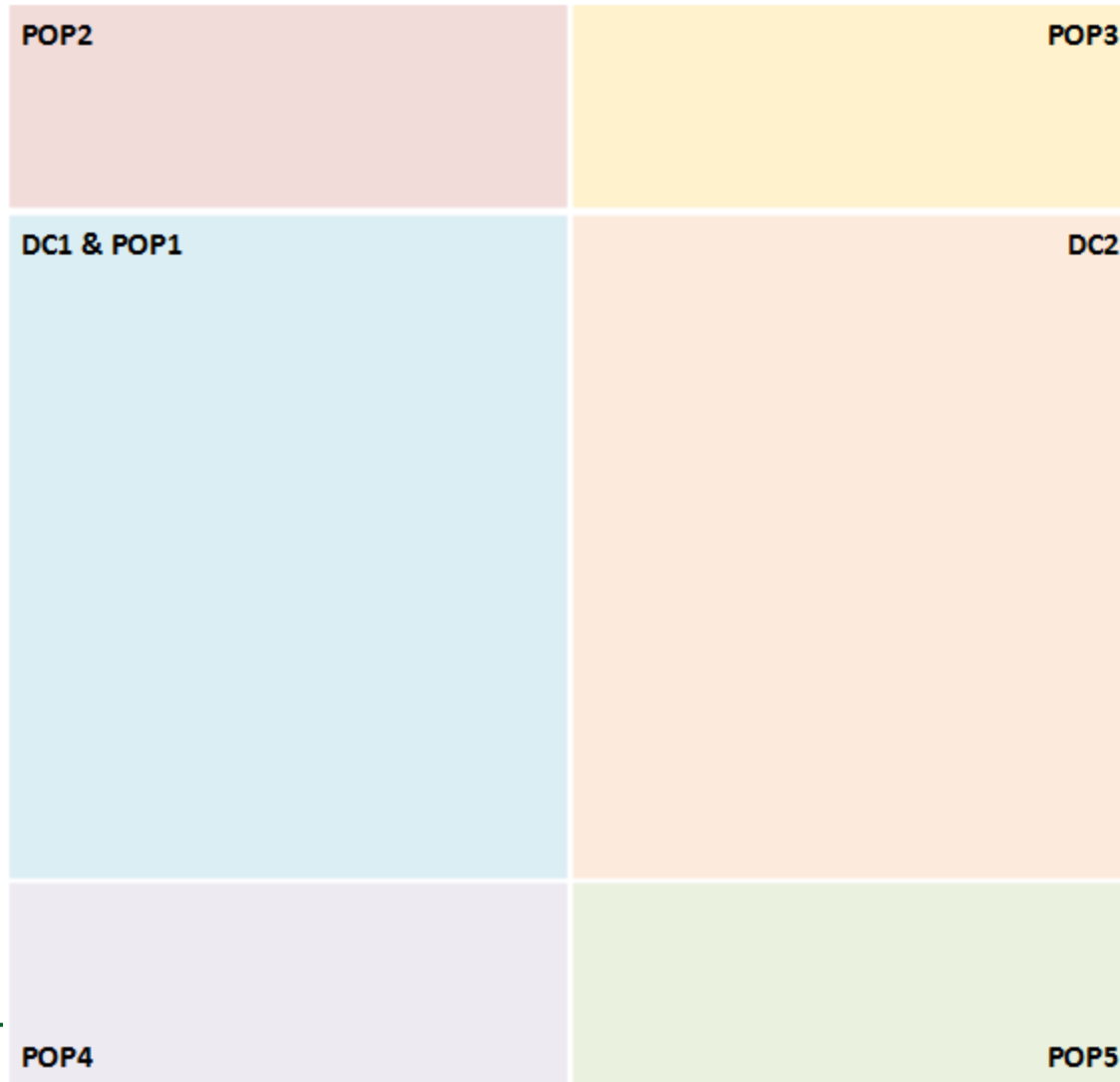


Migration

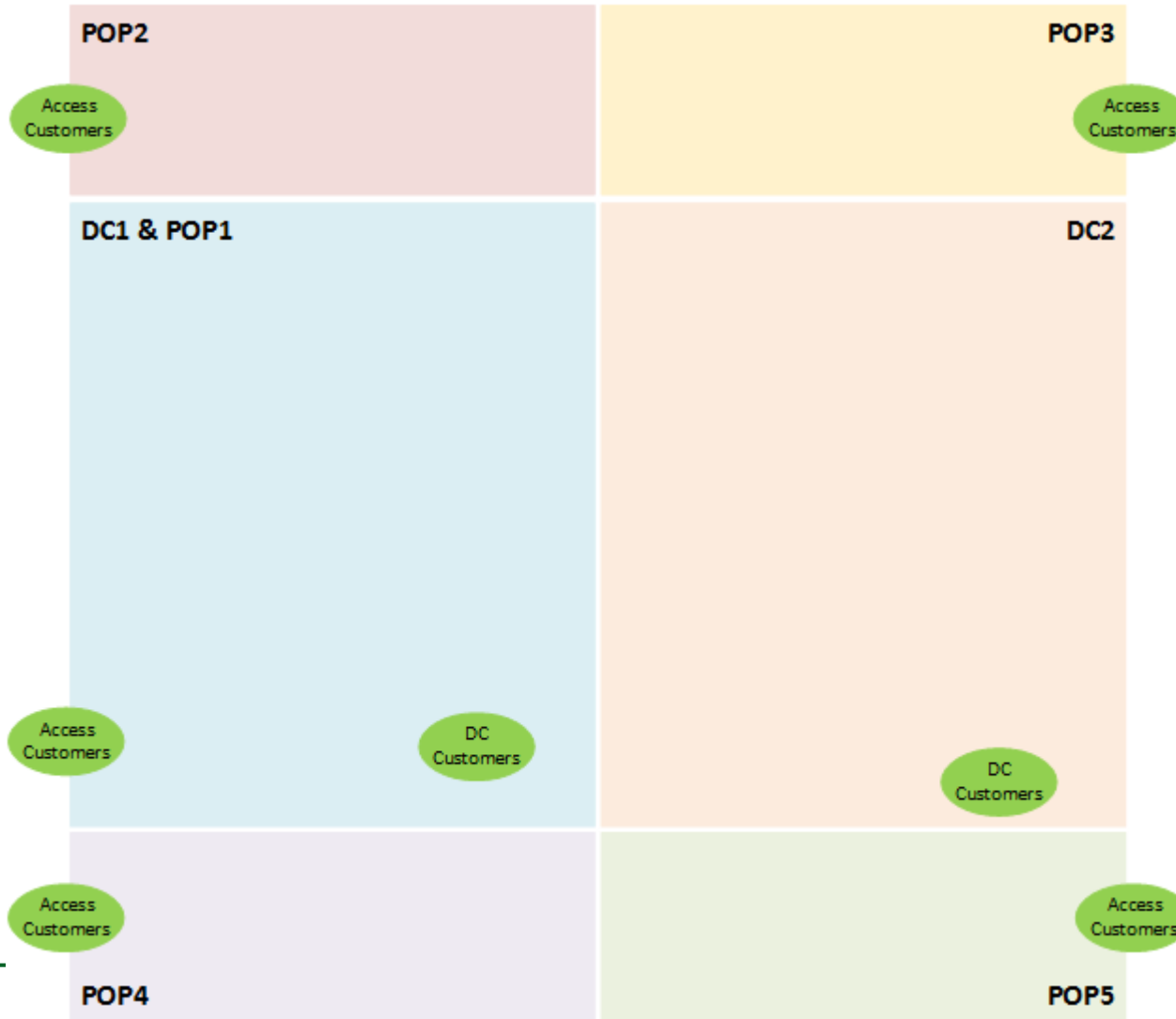
- One location at a time
- During Slow traffic times
- Change customer port from old to new switch
 - Only 15 – 30 seconds downtime
- CMTS are dual homed, no downtime



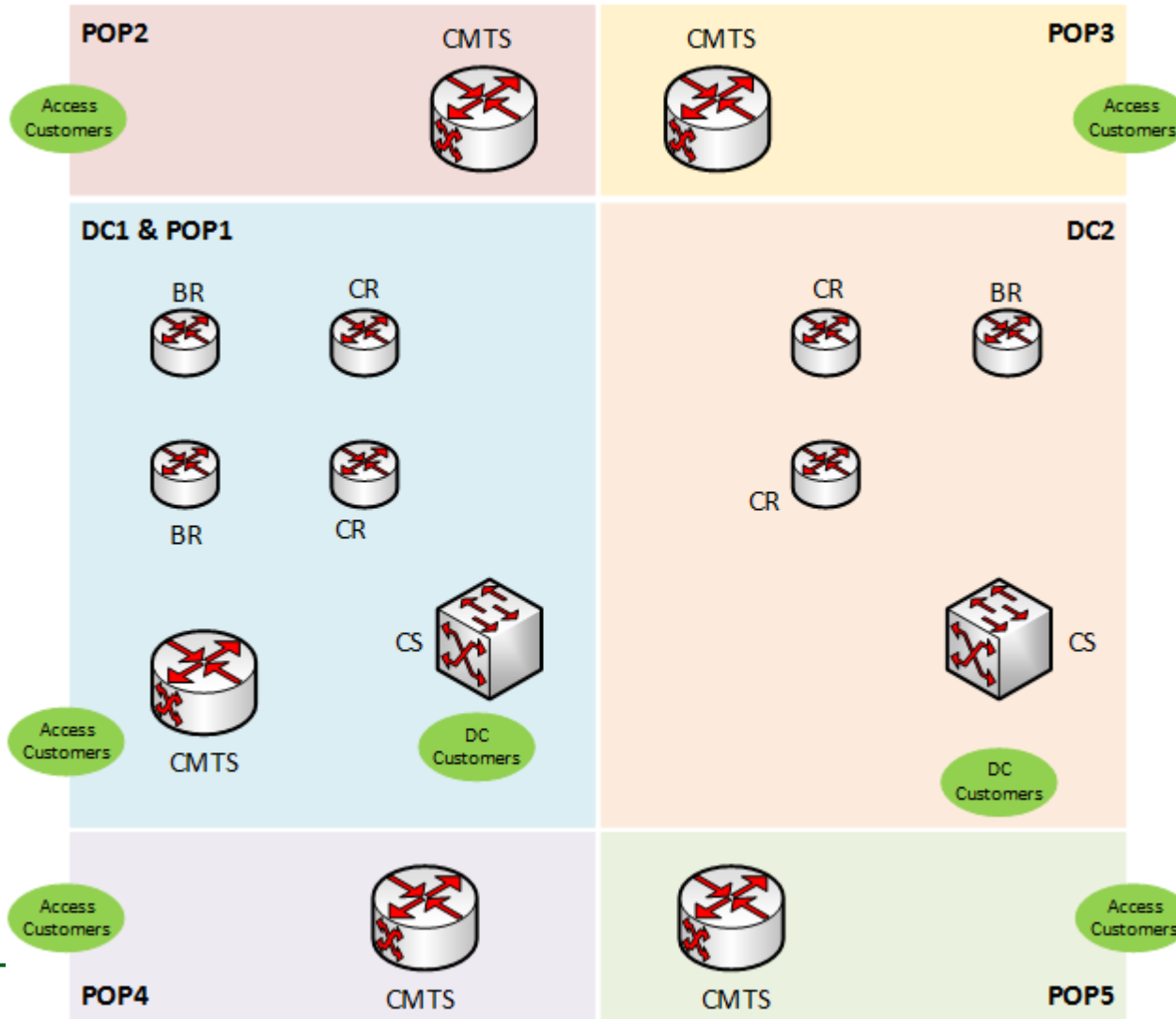
Location



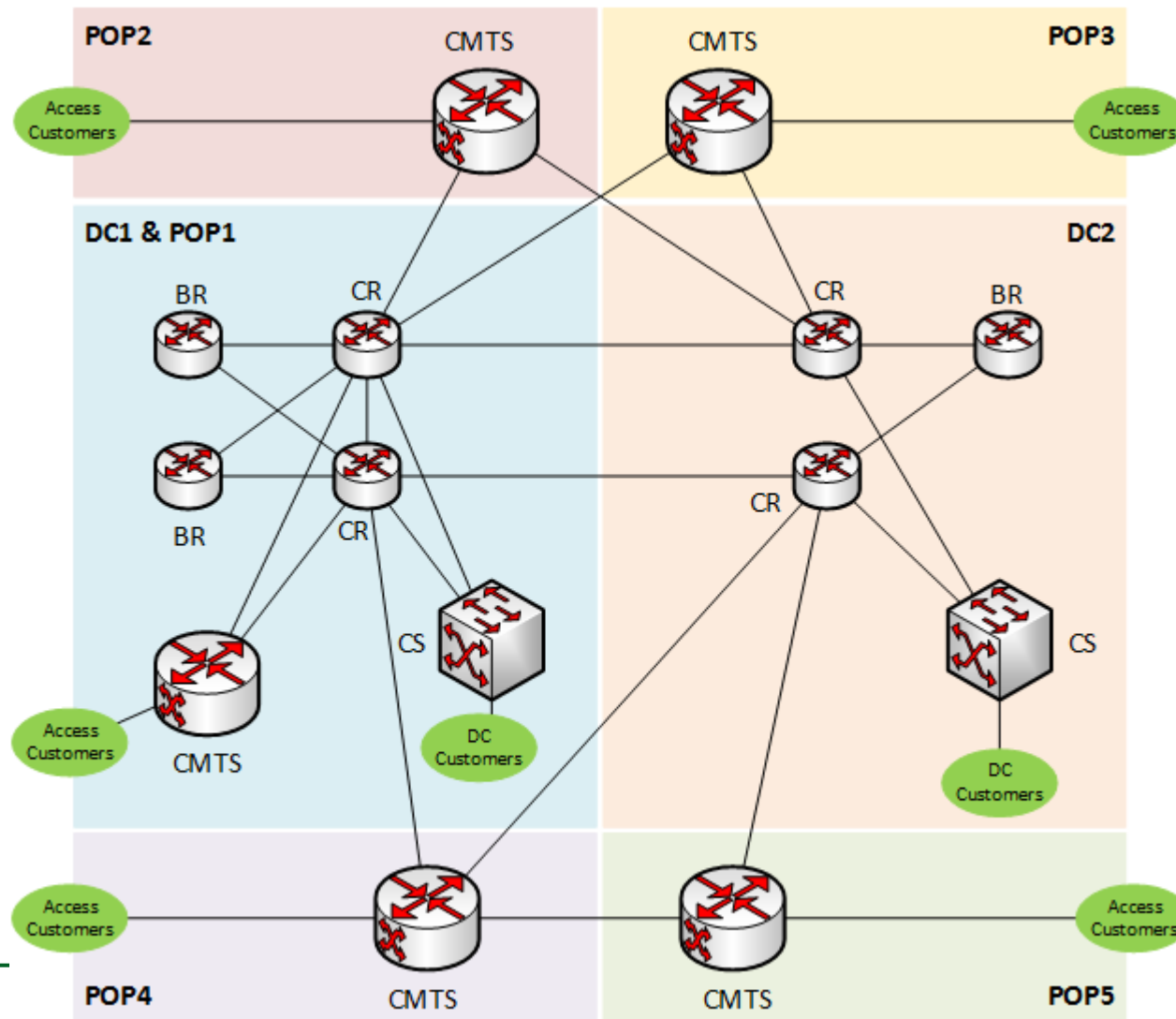
Customers



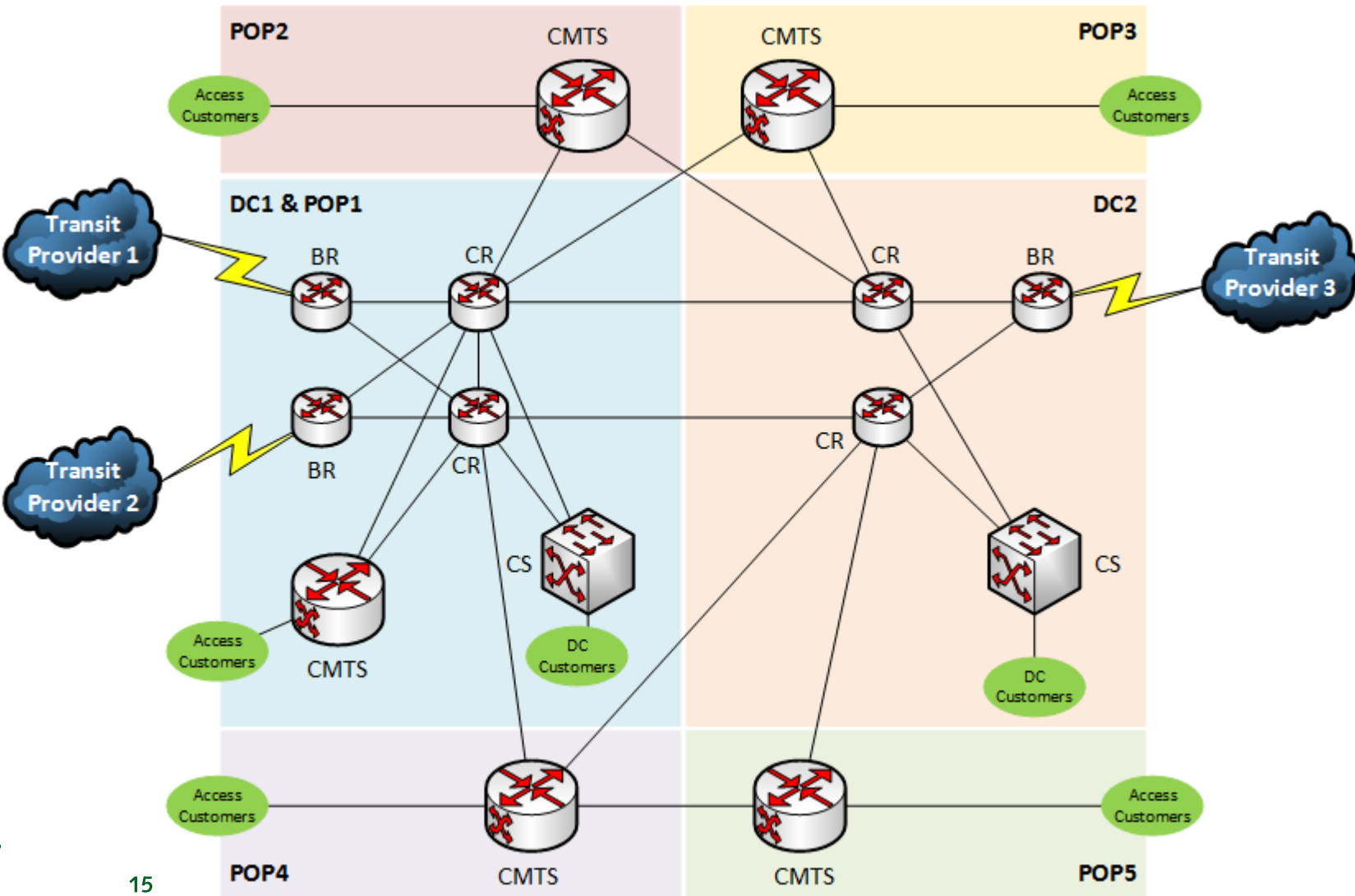
Equipment



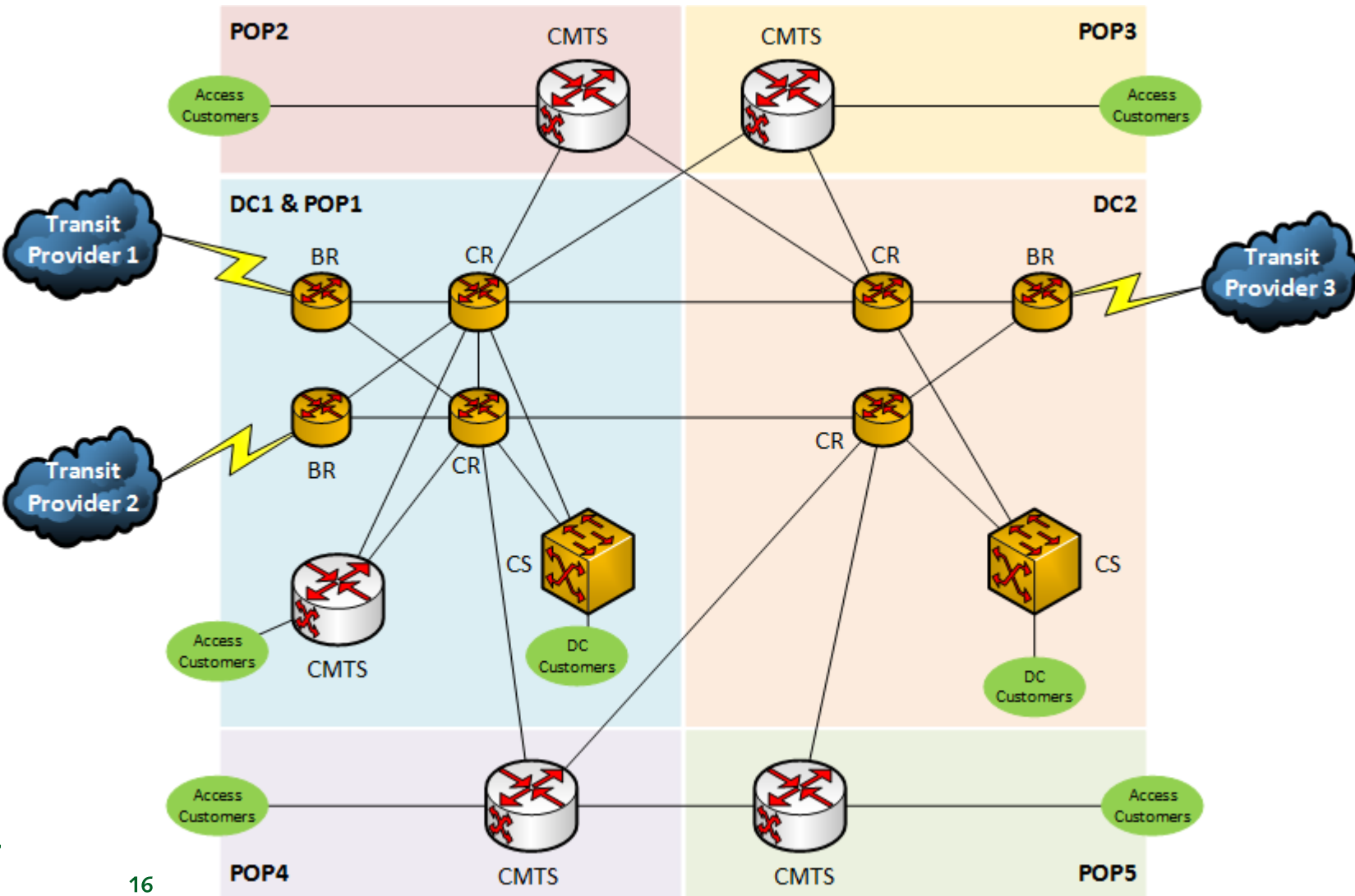
1 Gbps Links



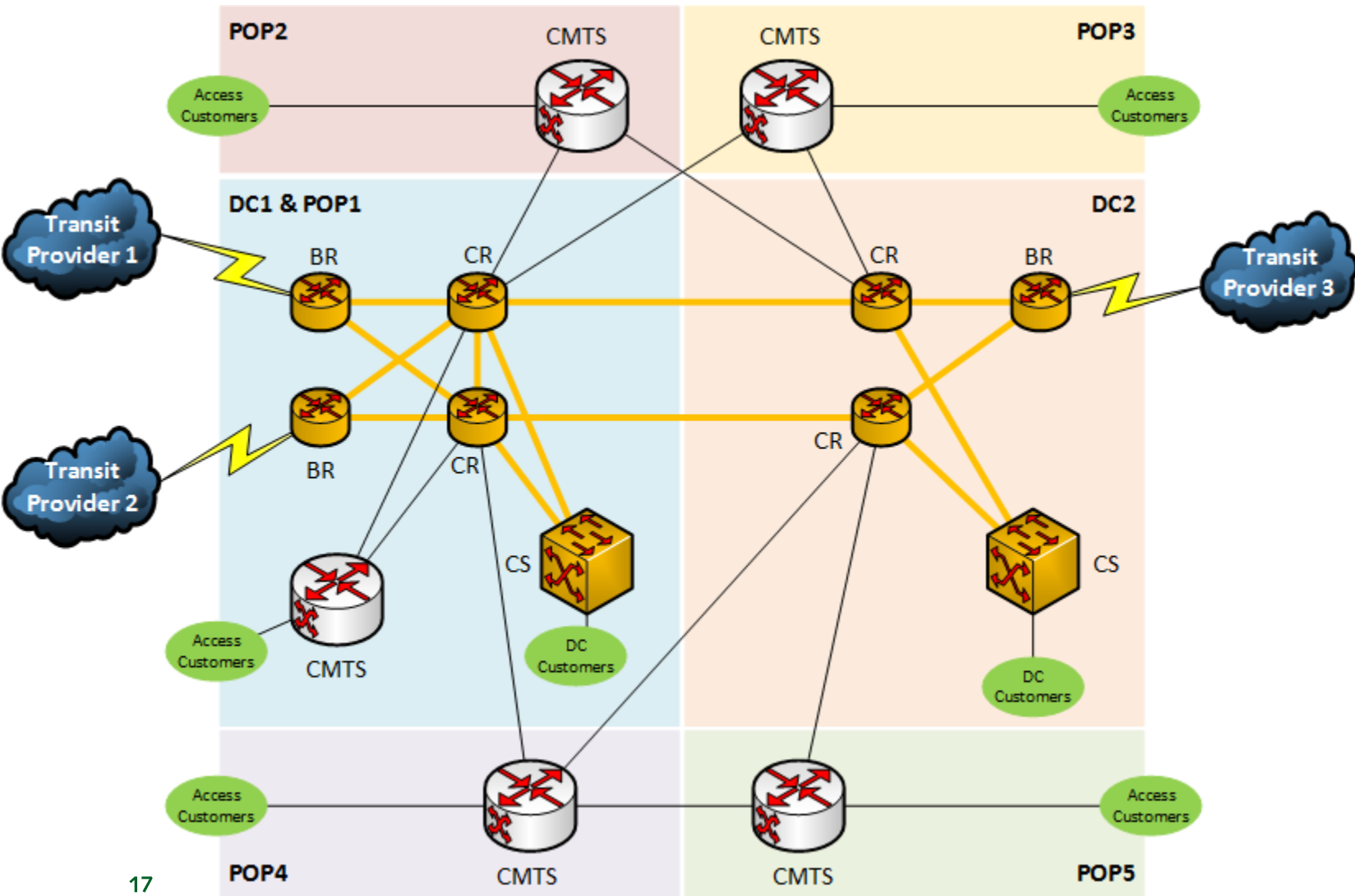
Transit providers



Equipment replaced



10 Gbps Links

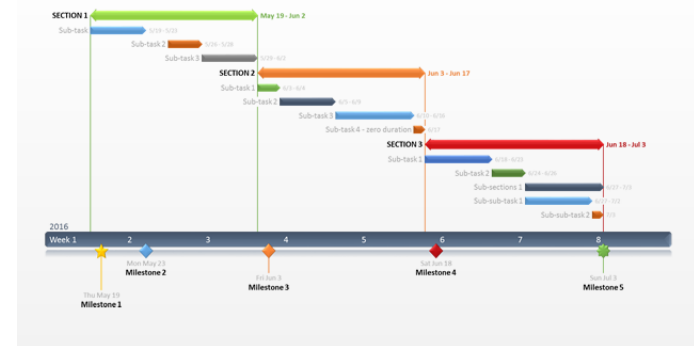


Issues Faced

- Not all up-link providers were IPv6 capable
- IPAM was not able to handle IPv6 address
- Some vendors not fully IPv6 capable
- Human resistance to change

Lessons learned

- Train the staff
 - Network teams
 - Support teams
- Don't trust your vendor, but test
- Inform everybody
 - Management
 - Customers
- It needs time & planning



How to contact me ?

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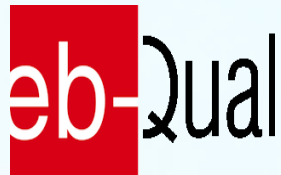
Personal Blog: www.cblumer.eu

(not very well updated ☹)

Question ?



Thanks to all our Sponsors



Sources

■ Images

- <https://www.zyxel.fr/solutions/ipv6/>
- <http://teamarin.net/2013/03/13/resource-guide-to-preparing-your-it-staff-with-ipv6-training/>
- <http://tutosio.fr/404/>
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