

# Mobile Broadband IPv6 Service

## *MENOG 7*

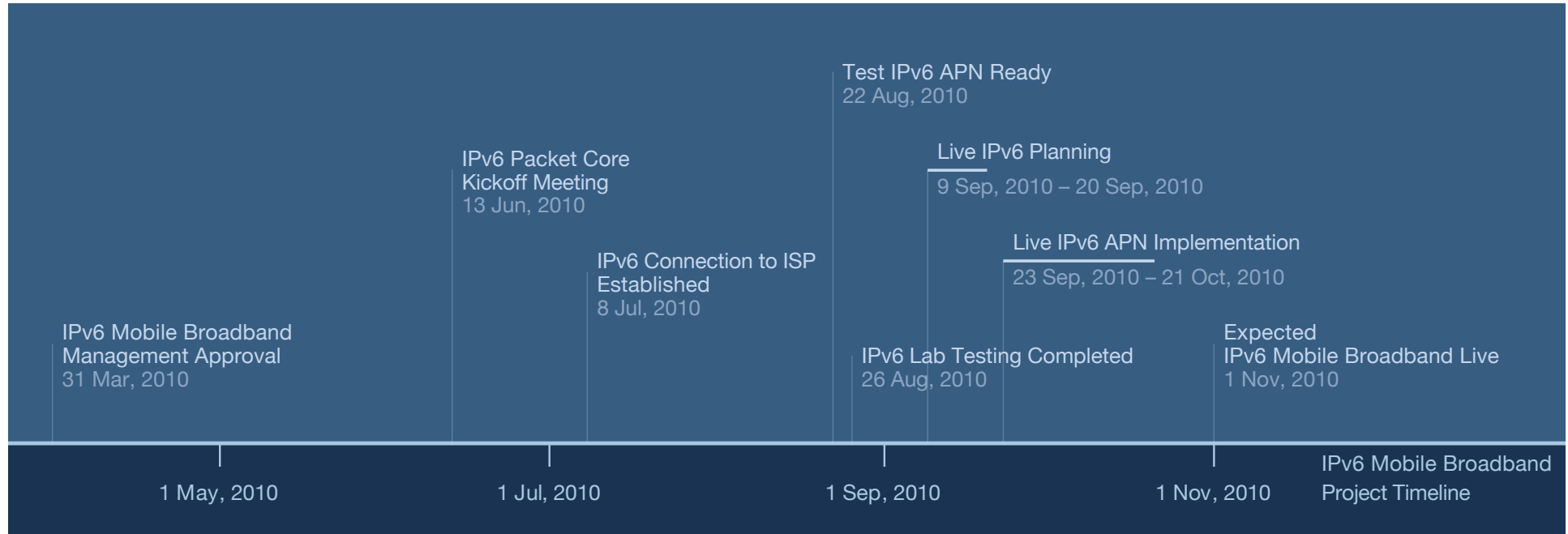
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# Qtel IPv6 Overview



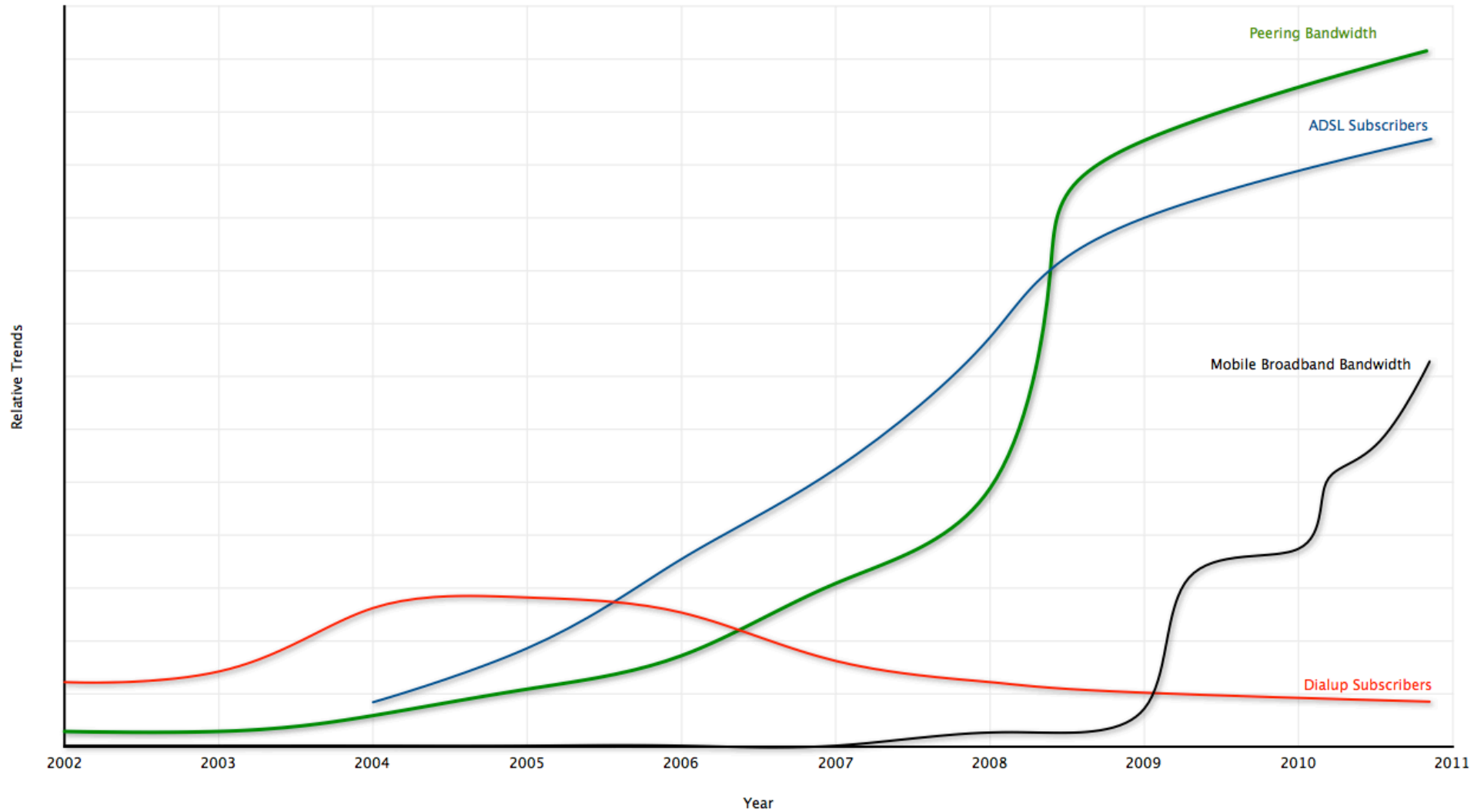
- Qtel IPv6 Mobile Broadband Background
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# Qtel IPv6 Mobile Broadband Background

# Qtel's IPv6 Strategy & Priorities

1. Provide IPv6 capability for consumer access services
2. Prioritize services with largest public address space requirement
3. Maintain IPv4 for infrastructure and O&M whenever feasible

# Qtel Internet Service Trends



# The Case for Prioritizing IPv6 on Mobile Broadband

1. Largest and fastest growing number of subscribers
2. Least number of CPE issues
  - a) Broadband Forum IPv6 support still at Working Text stage
  - b) Supposedly wide IPv6 support in User Equipment (UE)
  - c) HSPA modems generally don't require IP addresses
3. Least disruption to existing infrastructure

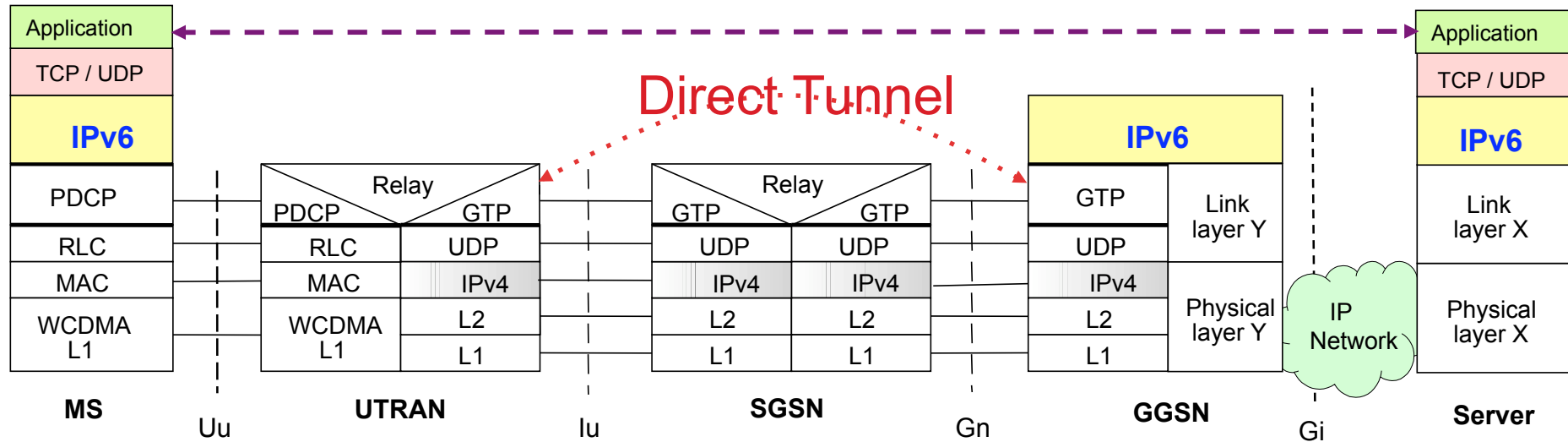
# Building and IPv6 Mobile Broadband Service



# Mobile Service Considerations

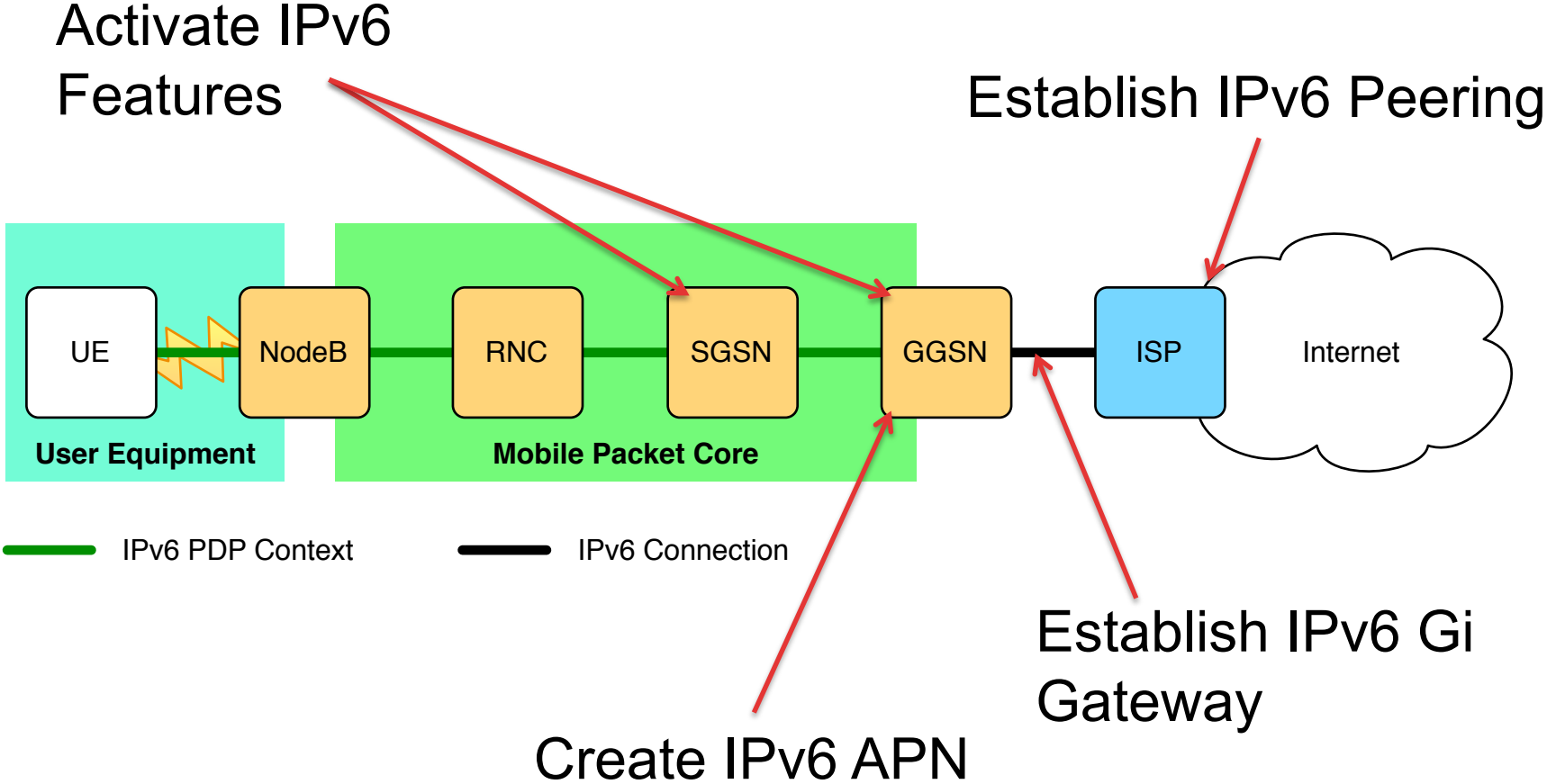
- 3GPP Release versions
  - 3GPP Release 7 (current) does not support dual stack
  - 3GPP Release 8 (LTE) supports dual stack
- UE IPv6 Support
  - WiFi generally supported
  - 3G less clear
- Performance of IPv6 APN vs. IPv4 APN
  - Throughput, latency, etc.
  - Mobile device power consumption
- Access Point Name (APN) Requirements
  - An APN address pool is either IPv4 or IPv6 (i.e. new APN required)
  - Seamless transition to IPv6 considering diversity of UEs

# IPv6 PDP Context

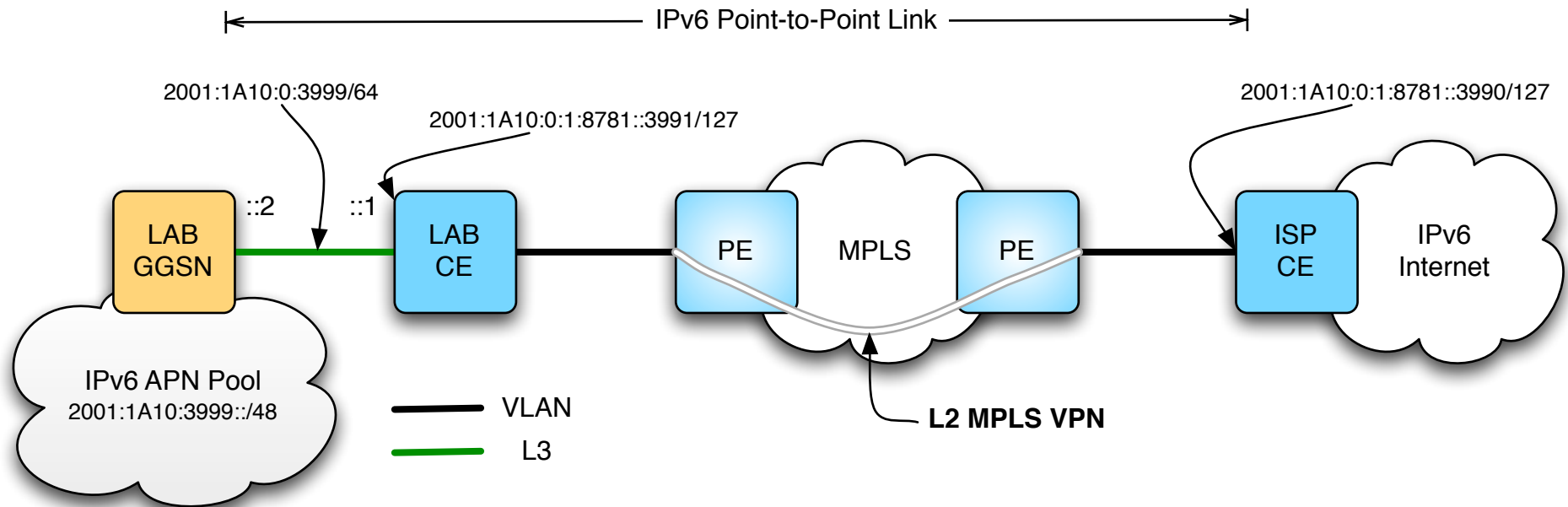


- Packet Data Protocol (PDP) Contexts link the mobile device to the Internet infrastructure
- GGSN must support IPv6 PDP Context & APN
- SGSN & UTRAN infrastructure can remain IPv4
  - User traffic is tunneled using GTP regardless of IPv4 or IPv6

# Mobile Broadband IPv6 Logical Drawing

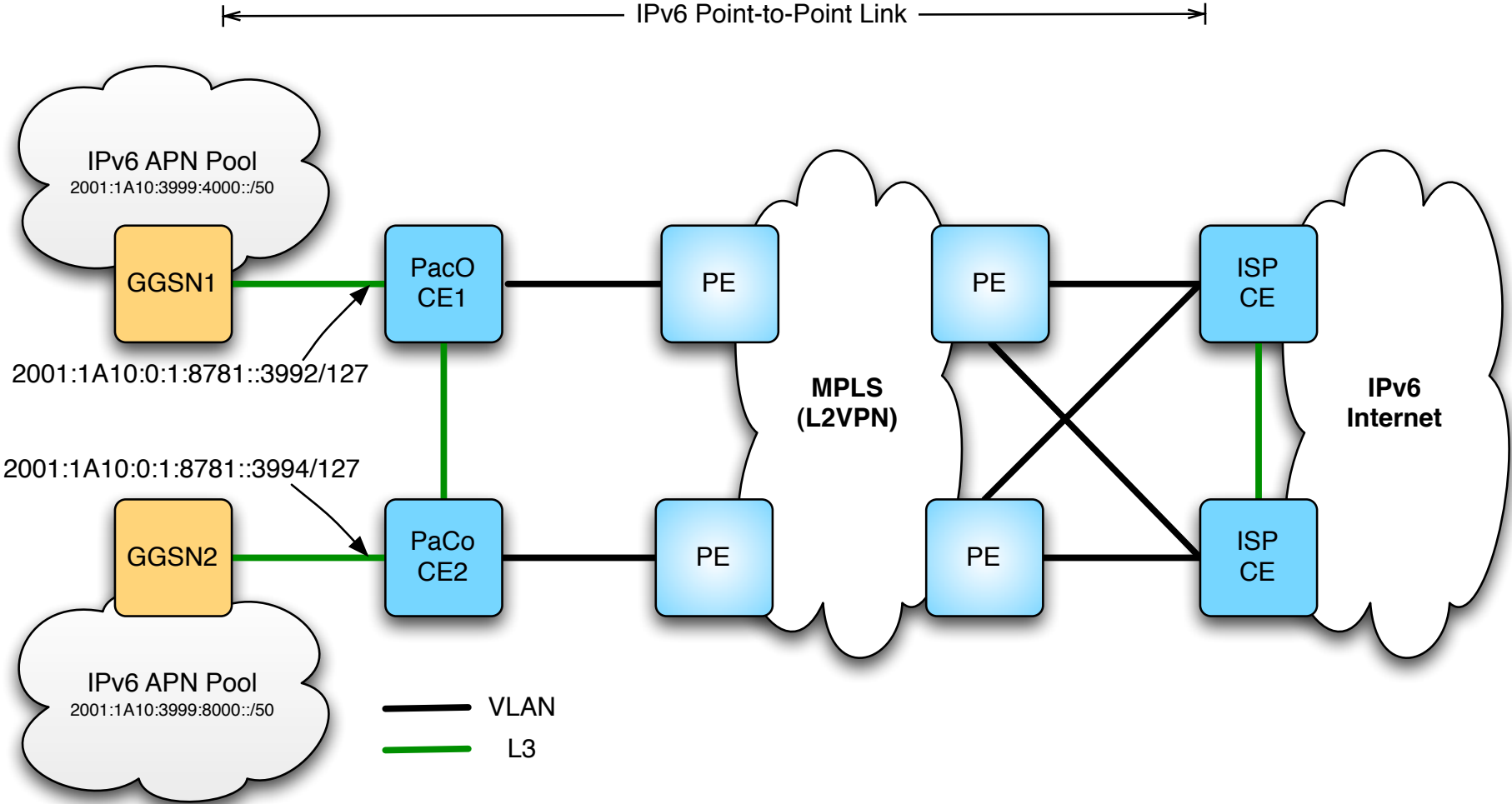


# Mobile Broadband IPv6 Lab Setup



- L2 Tunneling reduces the scope of potential IPv6 issues
- Point-to-Point topology reduces complexity
  - The focus is on IPv6 in the Mobile Packet Core

# Mobile Broadband IPv6 Live Deployment



# Lessons Learnt

# Lab Testing

- More difficult than establishing an equivalent IPv4 Lab
  - Unfamiliarity of IPv6 amongst stakeholders
  - Issues with relatively new software features
- Shortened service development timeframe
  - No risk to live service thus simpler change approval process
  - Sandbox for engineers to learn from mistakes
- There is a financial cost
  - Mobile Packet Core test lab infrastructure
  - IPv6 feature licensing costs

## Going Live

- Introducing & supporting the additional IPv6 APN is complex
  - subscriber configuration management (may initially be manual)
  - Service configurations (Portals, MMS, etc.)
  - Support systems & billing
- Handset support
  - Identifying IPv6 capable UEs
  - Procedures for configuring new APN on UEs
  - Identifying and communicating with IPv6 candidate subscribers
- Measuring success of Mobile Broadband IPv6 service
  - Classifying source of issues (UE, Packet Core, ISP, etc.)
  - Measure churn between IPv6 and IPv4 APNs



## Highlights

- Project finished in approximately 8 months
  - Extra time required due to summer vacations & Ramadan
- Relatively modest network infrastructure cost
  - GGSN/SGSN licenses
  - Professional Services
- No disruption to live IPv4 Mobile Broadband service
  - Dedicated APN
  - GTP Tunneling
- Major challenge is commercially supporting live IPv6 service
  - Internal training
  - Subscriber configuration issues
  - UE support issues

# Potential Next Steps...

# Academic Engagement

- Engage Qatar-based Universities and Colleges as they can be good resources for;
  - Self-sufficient “tech savvy” users providing constructive feedback
  - Innovative adoption & development of IPv6 infrastructure
  - Helping support the transition to IPv6 within Qatar’s IT community

# Community Engagement

- Establishment of a local IPv6 Forum;
  - Tangible demonstration to the community that preparations are well underway for IPv4 address space exhaustion
  - Stimulate training and education in the ICT industry
  - Encourage development of IPv6 .qa content and resources

# Transition Technology Trial

- Identify transition technologies best suited to the Qatar market;
  - Migration of access infrastructure to IPv6
  - Manage the complexity of crossing IPv4/IPv6 domains inside the service provider infrastructure
  - Seek incentives for users to migrate to IPv6
  - Automatic steering of IPv6 capable UEs to IPv6 APN

Thank you.

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