Sonatel: An IPv6 Experience

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Outline

- Why IPv6?
- Networking strategy in one slide
- Sonatel context
- Organizing an IPv6 project
- Sonatel IPv6 organization
- Communication is key
- Lessons learned

- # IPv6 is the only perennial solution to global IPv4 address depletion

- # But IPv4 service continuity during forthcoming transition period is a MUST

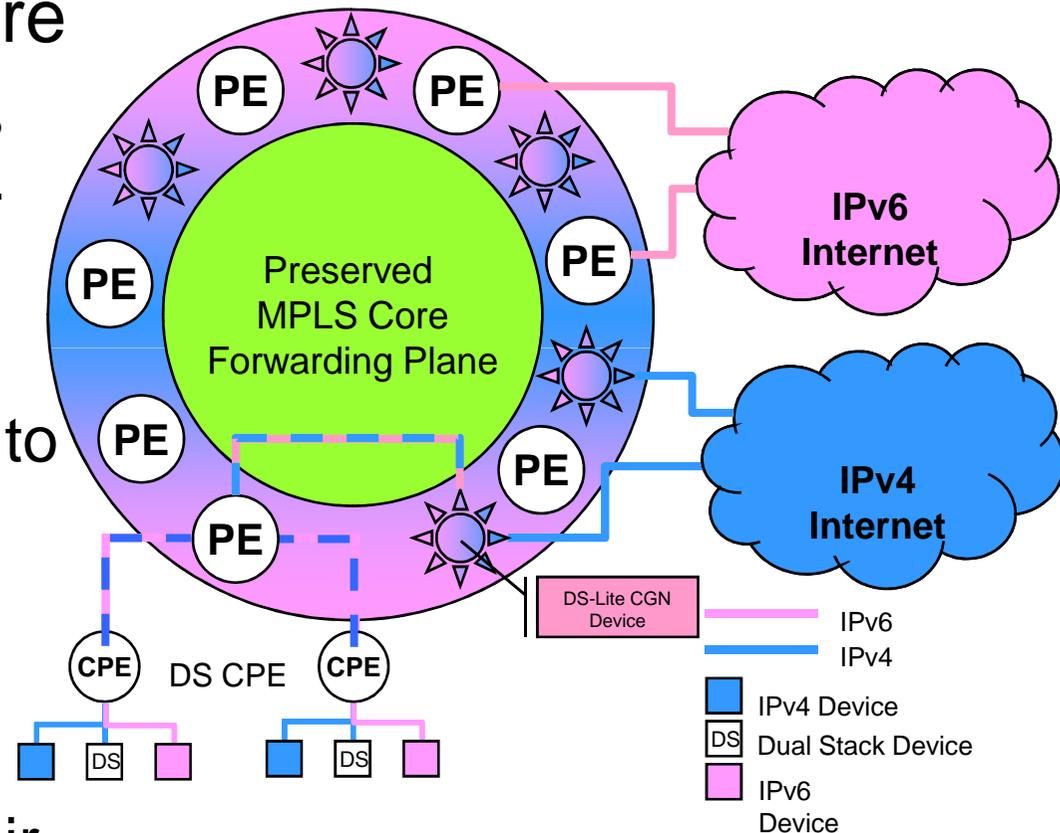 - – Not addressed by IPv6 because migration cannot be done overnight

Why IPv6?

- Only perennial solution to IPv4 address depletion
- Cornerstone of business continuity and catalyst of business development
  - Mobile data, M2M
- One-size-fits-all solution
  - Enterprise, Mobile, N-Play, Wholesale

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(Fixed) Networking Strategy

- ## Dual Stack architecture
  - CPE, network devices and platforms are DS-enabled
  - IPv6 prefixes are dynamically assigned to CPE by means of DHCPv6
  - Hosts connected to CPE devices automatically form their IPv6 addresses

Preserved MPLS Core Forwarding Plane

PE
PE
PE
PE
PE
PE
PE
PE

IPv6 Internet

IPv4 Internet

DS-Lite CGN Device

CPE — DS CPE — CPE
DS
DS

IPv6
IPv4
IPv4 Device
DS Dual Stack Device
IPv6 Device

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Sonatel Context

- ## Anticipate global Internet evolution
  - Make sure customers can access IPv6 contents whatever their location (Asia, Europe)

- ## Consolidate technical leadership
  - Promote IPv6 usage while confirming robust know-how
  - Cornerstone of business development

- ## Become one of the major IPv6 African references
  - Staunch communication and evangelization efforts

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Going Step-by-Step

- **Consolidate IPv4 address usage and depletion forecasts**
  - As per business development perspectives and market coverage
- **Conduct audit, both network- and service-wise**
  - Assess IPv6 impact *including* IT
- **Derive project organization accordingly**
  - Yielding "Architecture", "Deployment" and "Operations" WGs
    - Not to forget (marketing-driven) "communication" WG
  - IT aspects may deserve specific project and further coordination
  - IPv6 training organization is strongly encouraged
- **Charter project governance**
  - Makes sure resources are properly allocated as per project scope, milestones and deliverables and IPv4 address depletion forecasts

Consolidation of IPv4 Forecasts

- **Measure current burn rate**
  - Number of IPv4 addresses allocated on a monthly basis
  - As a function of market coverage

- **Revisit current practice, *e.g.*:**
  - IPv4 addresses used to number routers of the network
  - IPv4 efficiency ratio and possible optimization opportunities

- **Estimate IPv4 address depletion accordingly**
  - Major milestone for IPv6 project organization and subsequent retro-planning

- **Effort can take a week or more depending on organization scope**

IPv6 Audit

- **Provide detailed inventory of various components:**
  - Not only routers (with detailed OS, S/W and H/W configuration)
  - But also servers (DNS, DHCP, AAA) and platforms (if any – VoIP, IPTV)
  - Let alone IT and CPE, and possible mobile devices (GGSN)

- **Document network topologies**
  - Current design may also influence the way IPv6 will be introduced

- **Effort usually takes no more than a couple of weeks**
  - Assuming a minimum of dedicated resource(s) in the country

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Two-Phased Project

- ## Phase 1 (2009 – 2011)
  - Service scope-restricted pilot deployment covering both residential (Internet service) and corporate (IPv6 VPN service) markets

- ## Phase 2 (2011 and beyond)
  - Design and organize IPv6-enabled IPTV service offering
    - E-learning facilities provided to Senegalese academics in collaboration with French NRN
  - Refine engineering rules and operational procedures prior to generalized deployment (fixed)
  - Investigate mobile environments

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Communication is Key

- **IPv6 training organized in October 2009**
  - Opportunity to develop Sonatel management's IPv6 awareness

- **Dakar's SISIT conference of October 2010**
  - Successful opportunity to promote IPv6 usage towards potential corporate customers

- **Participation to June 8 World IPv6 Day**
  - Native IPv6 access to Sonatel portal

- **Support of IPv6 ad hoc features is mandatory as documented in every RFP initiative**

(Some) Lessons Learned

- **Transition** is where most technical challenges reside
  - IPv4 service continuity is a MUST
  - IT should be upgraded first
- Some vendors are not IPv6-minded yet
  - *E.g.* CPE and STB markets
  - This sometimes mandates in-house workarounds that delay generalized deployment
- Project resources MUST be committed
  - Key to project success
  - Think IPv6 as an opportunity not a constraint

Thank You!

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