



IPv6 Transition for VzW

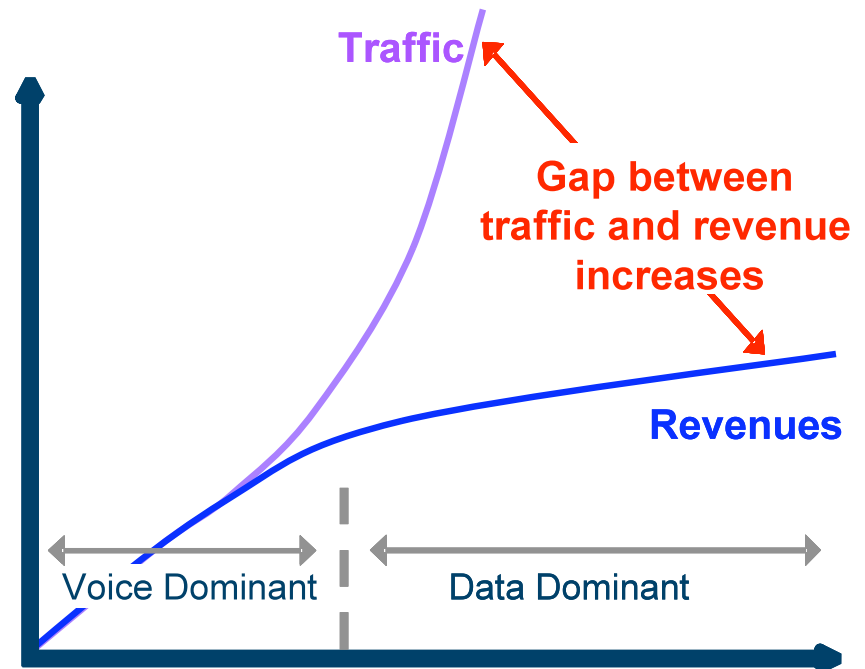
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Verizon Background

- >45,000 Cell Sites
- >90M Subs
- ~80 Mbps Peak Sector Throughput
- ~250 Cell Sites per MTSO/ MSC



2009
600 Mbps per MTSO



2015
>20 Gbps per MTSO



Addressing v4 Exhaust

- **Deployed NAT at ~40 Locations**
 - Each NAT has the entire RFC-1918 Space (Overlap)
 - Network was naturally federated so federating the address space was a natural evolution
 - Migrating all BB in Phase 1
 - All Smart Phones in Phase 2



Device Addressing

- **Dual Stack UE**
 - RFC-1918 IPv4 Addresses
 - Gateway Initiated Dual Stack Lite
 - Public IPv6
- **Each device will have Two IP Addresses**
 - VoIP (v6 Always On)
 - Internet/ASP (v6 or v4)



Devices

- **First IPv6 devices will be available 4Q2010**
 - USB Dongles
- **Handsets will become prolific in 2011**



Infrastructure Addressing

- **MPLS**
 - 6VPE
- **LTE**
 - OAM, SGW, PGW, MME – IPv6
 - Some OAM will be IPv4
- **Legacy (EvDO, 1xRTT)**
 - Base Stations, MSCs, PDSN/HA, - IPv4
 - Legacy systems do not need to be converted and should phase out over time
 - Consume a minimal number of v4 addresses



Network Services

- **IMS**
 - IPv6
- **OTT VzW Services**
 - IPv6 when practical
 - Existing services will be converted by 2012
- **ASP**
 - Drive ASPs to provide IPv6 Services
 - Peer Directly as merited
- **Internet**
 - IPv4 NAT
 - IPv6 Native

DNS



- **Working to deploy Jason Fesler's proposal for Broken v6 Queries**
- **Subscriber DNS will support both IPv4 and IPv6 Queries**
- **Infrastructure DNS will be separate from Subscriber DNS**

Challenges



- **IPv6 is still a very new technology**
 - Most engineers have heard about it but don't know much about it
 - The Operations staff will require years to gain the equivalent level of competence
- **Training is critical**
 - Academic
 - Web-based classes
 - Hands-on experience