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The service delivery aspects of IPv6 migration and E.164 convergence

Alan Lloyd   6th November 2009

Question: Will cellular network and operator IPv6 initiatives address the growth demands of national IP infrastructures?

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Our perspective on convergence and migration

- ISO, ITU and IETF standards – 15+ years
- 3gPP IMS and LinkedIn SDP and IDM group member
- Consult to Government and Operators
- Co author RFC 1888 (NSAPs and E.163 in IPV6 (1996))
- IDM and SDP systems for Telco, MSO, Allied Military, Govt, Finance : EU, US and AU
- Converged Services Identity and Information Engineering
- Our new generation customer centric SDP – for OTT or Telco
- AND: By the way .. Australia only has 25 million people! But we connect to the world.

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Network end points and identifiers slowly evolve and converge. The online world cant be switched off for upgrades

- Telephone Numbers: Introduced in 1870 will be around for a while
- IPV4: 1983 to 2050?
- IPV6: 1995 to ?
- URI @name forms: hosts, users, companies, services, content, devices - 1985 -   forever… content URIs – they multiply every second.

DNS and dynamic DNS functionality – a critical function in the network that deals with its naming, addressing, topology and service properties and how distributed applications inter-work.

Identity and information management – a critical system function that determines how users relate to, manage and employ the services of the network.

Any network or service evolution affects both parts. It's a question of "rebuilding the plane while it is flying".. without the passengers complaining.

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The IPV6 migration issues are different depending on the country and network types, but all affect DNS configuration and E.163 endpoint and IP service management

OTT service providers – Use the Operator's fixed and mobile networks as well as private intranets / extranets

NBN initiatives are about national infrastructure for transport, health, education, energy management and emergency services and reaching more and more people with more services.

Mobile Operator – inserting IP technologies for their own global domain and device growth

Government and commercial users have their own Telephone systems and IPv4 Intranets and Extranets

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IP Addresses – its not getting any easier
Note: Even the way IP addresses are used can be different

IP addresses can be constrained to the "network layer" … OR

- Assigned for load balancing and fail over
- Assigned to locations.. Location based content services
- Used to identify the source, to stop email spam and bandwidth abuse.
- SIP Uses port and IP addresses – see Via and Contact Headers
- Used to manage access systems (boot files and CPE).
- Used as revenue earning product sets (1IP, 2IP and 3IP)
- Used in fixed lease blocks for commercial customers
- Used under a range of DHCP leasing policies
- Used to trace communications or for interception
- Used to record customer access behavior (where and when).

IPv4 addresses now have service properties – as per the telephone number

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Operators – its not getting any easier
Note: Every country/operator will be different

- Complex data management, SDP and converged service issues
- Regulations – Emergency services still have to work
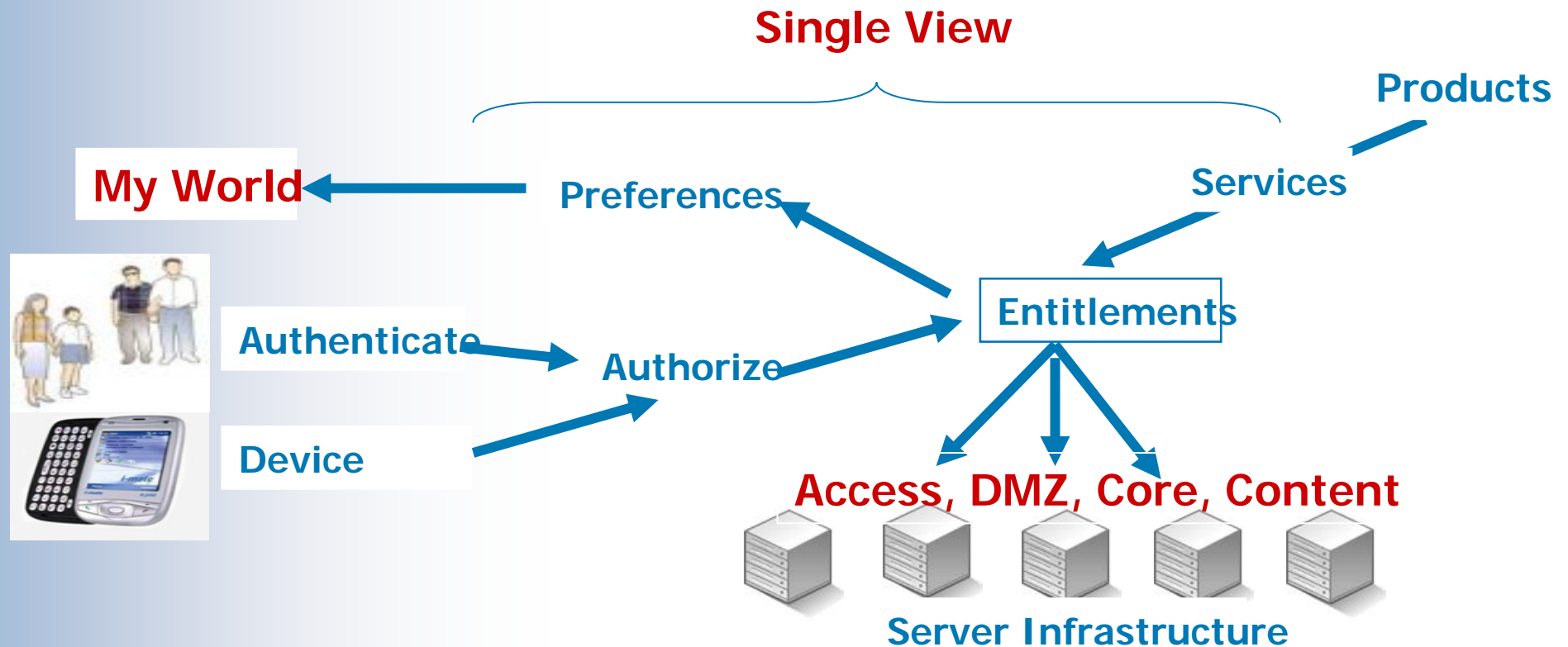- IMS – deployment is slow and looking like a SS7 replacement
- Mobile, IMS and Web 2.0 have different "monetisation" contexts
- Is the Operator's approach to IPV6 – universal?
- Telco – for SDFs and SDPs: seem to focus on frameworks and technologies– not composite services for customers in a retail world
- National operators – restructured to network, wholesale and retail
- "HSS" – too limited for complex, personalised, self care services.
- Over the Top (OTT) and smart phone developments are "detaching".
- Question:
  Can we rely on operators to be the leaders for national IPv4 – IPv6 network evolution strategies and the demands of online commerce?

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The user/device access and service delivery flow are the critical information contexts of a MSO

Single View

Products

My World

Preferences

Services

Authenticate

Authorize

Entitlements

Device

Access, DMZ, Core, Content

Server Infrastructure

And its all on TN,s IPv4, DNS and URIs - and applies many "domains"

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An Issue with architectures.
They all seem to have the "Magic Drum" – the database

?
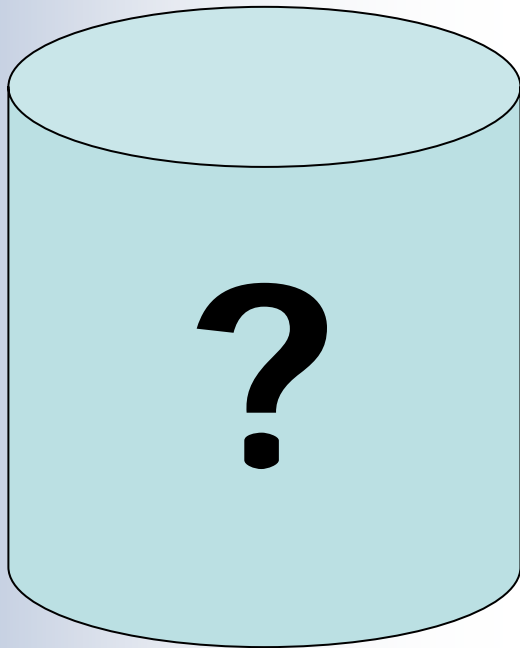
- But what is in them and how is the information designed, used and managed?
- And how many are there in a system?
- What does IPv6 change?

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Convergence and Transformation -
Doing the Information Scale and Performance Numb

- 20 million users @ 10,000 authentications per second
- 20 million mail boxes, address books..60 million entries
- 12m access devices (CMs, STBs eMTAs), 1000s of boot files
- 12m Telephone Numbers
- Personalised on demand converged services
- 10,000 products and services – and bundles
- 1000s of end user device types
- 1 BN items of content being delivered per annum
- 600M managed information objects for users, devices, services, etc
- 60 DNS servers , 1000 hits a second per server– all day every day
- 12m IP leases per day– means more addresses are needed

- Rule 1.. Don't upset customers, complaints cost money.
- Rule 2.. Attend to information scale, complexity, quality and performance
- Rule 3.. Don't upset DNS or DHCP

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IPv4-6 Is an Operational Issue

- **Will there be charges for IPv6 usage?**
- **Are their IPv6 friendly customers?**
- **How are these users and devices activated?**

How do we manage the evolution of the users, services and the technologies of the Telephone and the Internet systems - that are dynamic and critical to social and business well being of the world.

Perhaps we need to apply service management functionality…
We call this a Service Delivery Platform

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Our (new) Service Delivery Platform Is a management and convergence function, it comprises 3 layers

Management and governance layer

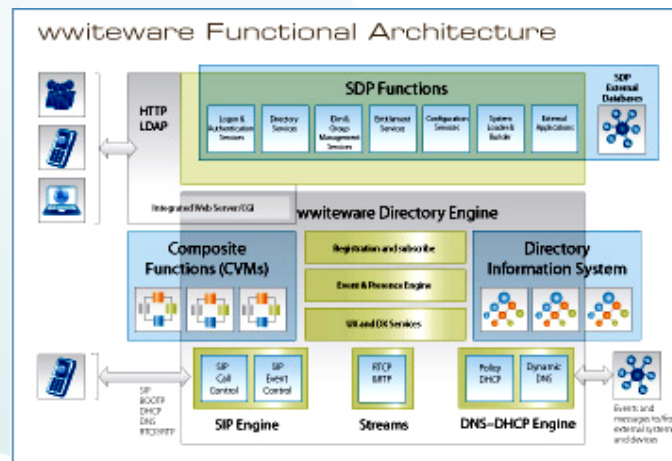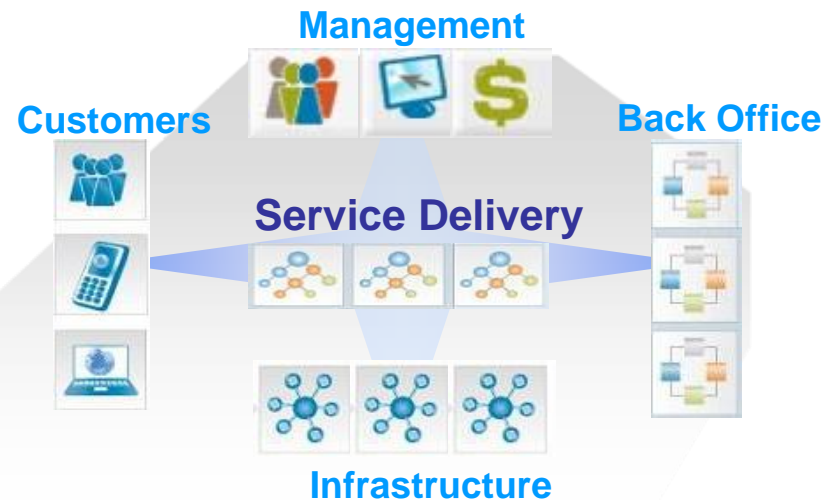**Service convergence and directory engine**

Protocol convergence layer

wwiteware Functional Architecture
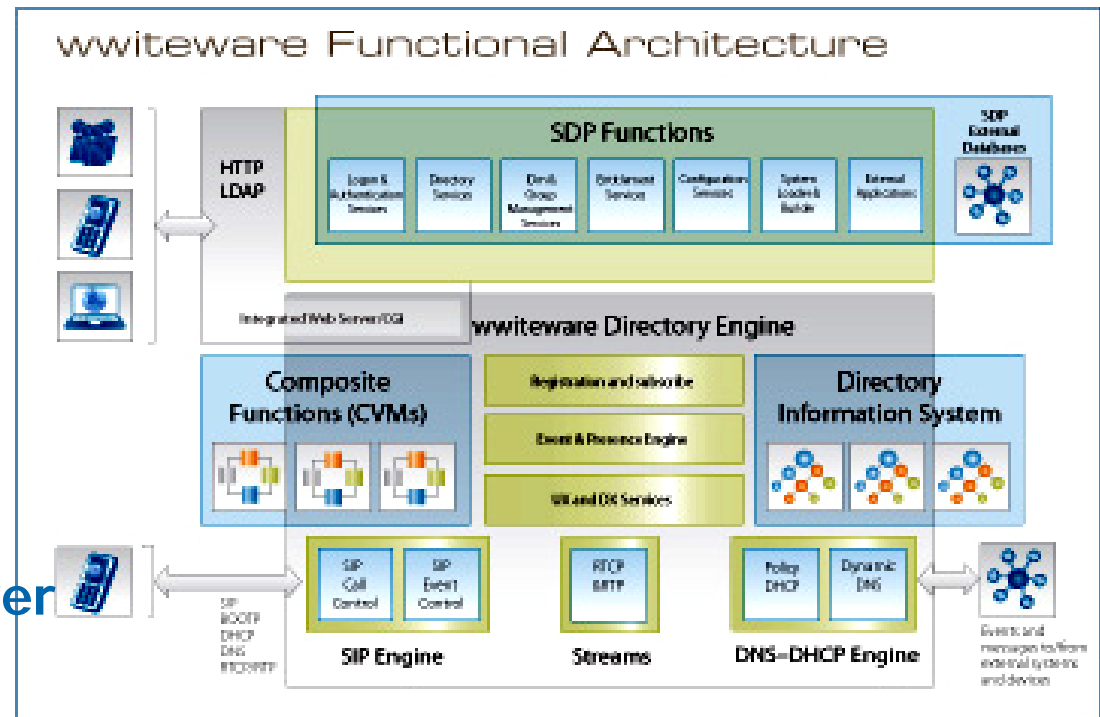
The SDP has been designed for OTT and Telco applications

Telco   MSO

Smart Grid

eHealth

Transport

Government

Precincts

Airports

Hotspots

Customer Centric Service Delivery Platform
within a system

Customer   **Front Office**   **Back Office**

Name
Telephone No
Email
Account Id
Billing address
Services purchased

3rd party service providers
Service hotspots
Identity
Groups
Entitlements
Preferences
Presence
IMS/SIP access
Device management
Self Care

Service Delivery Platform

| Shop | Commerce Control | Order Management | Product Catalogue |

| Web Access | Inventory control | Fulfillment |

| PBX / IVR | Billing | Suppliers |

| Help Desk | CRM | Data Warehouse |

| Analytics |

Infrastructure

| DNS | Network | Network and Systems Management |

| DHCP |

Dynamic DNS
Policy based IP address management
Click through management

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Perhaps IPv6 transition needs a services management focus within and between networked systems.

Mobile

OTT

NBN

Government and Commercial
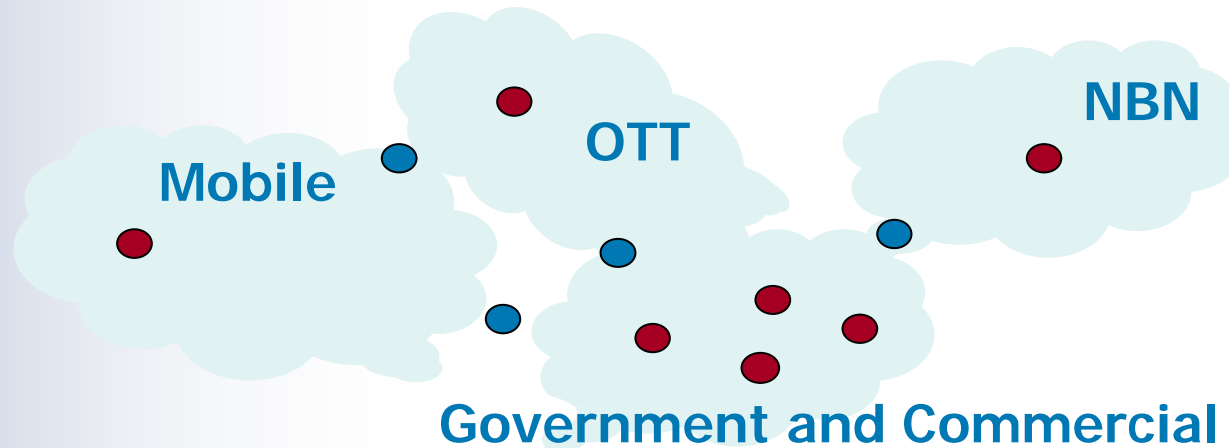
- Our view is the strategy and machinery that manages what DNS represents for its interconnected networks, applications, content and users - needs to be addressed at the national level.
- That is IPv6 migration needs an operational strategy that reflects how IP services and DNS are simulated and then managed going forward – and what it costs.
- The key requirement is Rule 3… Don't upset DNS, It needs to evolve safely and under supervision using user and service management functions.

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Questions

Our sincere thanks to Hui Deng and China Mobile for hosting this great event

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alan.lloyd@wwite.com
www.wwite.com

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