Presentation for CITC IPv6 Taskforce

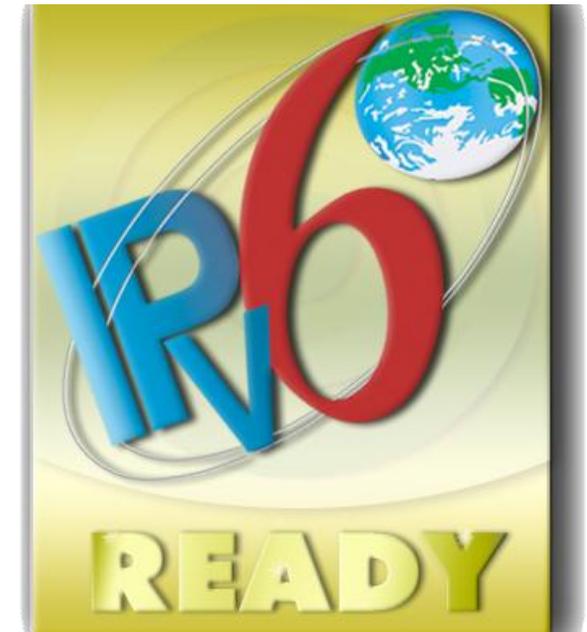# Challenges in the migration to IPv6

October 2010
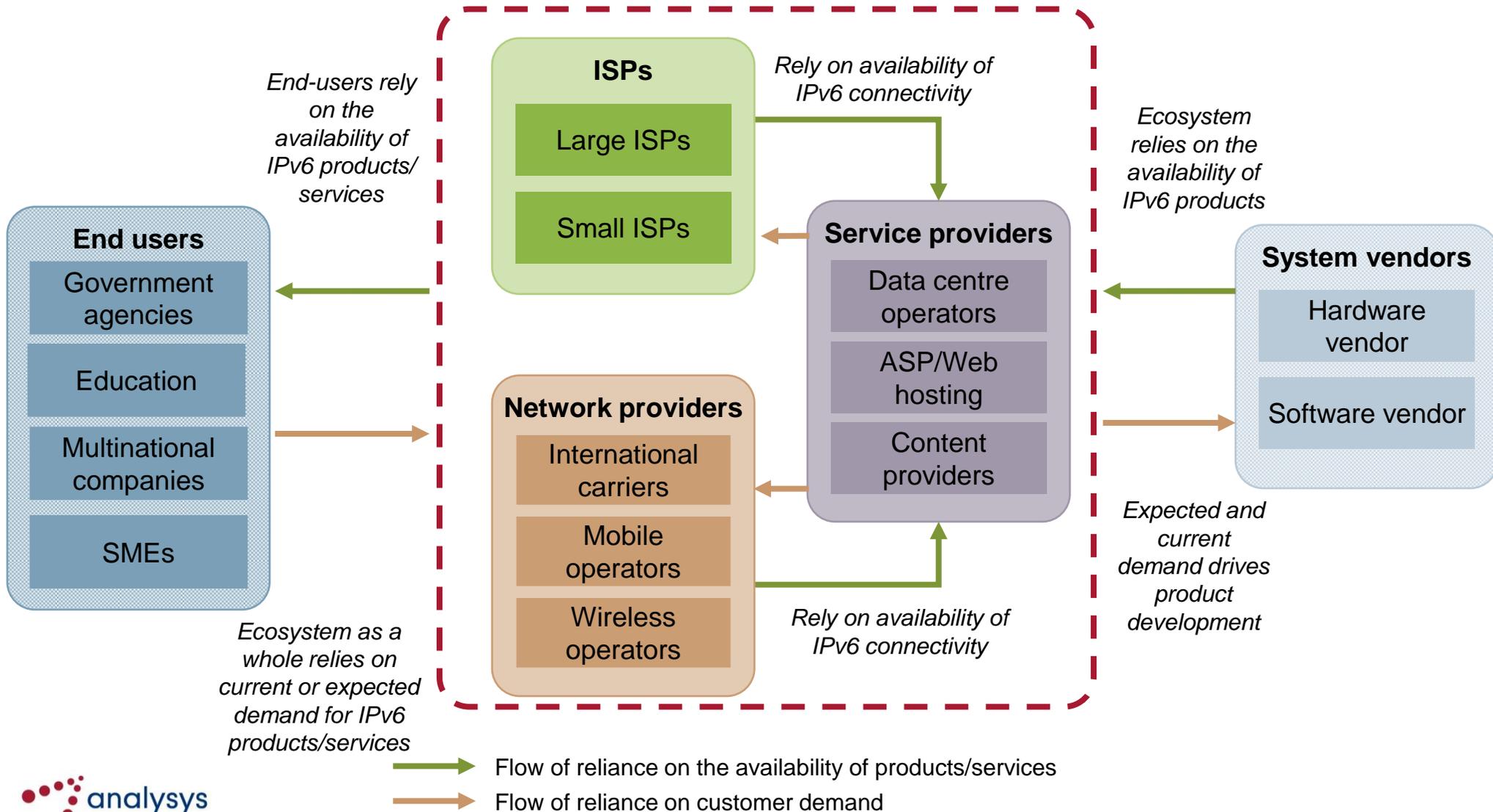*Ref: 17534-403*

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Why the transition to IPv6 is important

- It is predicted that there will be a shortage of IPv4 addresses – the unique identifier for all devices running on the Internet…

- …and that this could affect the availability of IP services

  - IP addresses are being taken up by the surge in smartphones and smart devices

- Current projections indicate that the Internet Assigned Numbers Authority and the various Regional Internet Registries will run out of IPv4 addresses within the next few years

- **IPv6 has over 28 orders of magnitude more potential addresses than IPv4**

Are you IPv6 ready?

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Source: IPv6 Forum

The adoption of IPv6 is a function of a complex set of interactions and dependencies

End-users rely on the availability of IPv6 products/ services

ISPs

Large ISPs

Small ISPs

Rely on availability of IPv6 connectivity

Ecosystem relies on the availability of IPv6 products

End users

Government agencies

Education

Multinational companies

SMEs

Service providers

Data centre operators

ASP/Web hosting

Content providers

System vendors

Hardware vendor

Software vendor

Network providers

International carriers

Mobile operators

Wireless operators

Rely on availability of IPv6 connectivity

Expected and current demand drives product development

Ecosystem as a whole relies on current or expected demand for IPv6 products/services

→ Flow of reliance on the availability of products/services

→ Flow of reliance on customer demand

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Source: Analysys Mason

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Migration to IPv6 requires a structured approach

Assessment
- Undertake a thorough evaluation of the current IPv4 network posture and identification of gaps to define short-term and long-term IPv4–IPv6 migration blueprints

Planning
- Create an appropriate business strategy and plans for the migration from IPv4 to IPv6

Design
- Develop network architecture overviews and architecture specifications to provide a baseline for implementing a defined IPv4–IPv6 migration strategy

Implementation
- Implement a rapid and focused deployment of core and distributed network elements
- Deliver on-site system health checks, maintenance and tuning

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A number of governments have recognised the need to stimulate the adoption of IPv6

The US government has set a target for all agencies to upgrade their networks and services to IPv6 by the end of September 2012, with a deadline of the end of September 2014 for their internal networks

The US government is planning to run a series of workshops to refine best practice for upgrading to IPv6 and to test commercial products.

The Indian government has stated that all ISPs and telecoms companies should be 'IPv6 compliant' and offer IPv6 by the end of 2011

In addition, government agencies must adopt the new version of the protocol by March 2012

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…mandating IPv6 for government networks provides a powerful stimulus to the supply side of the market

The Japanese government has established the IPv6 Promotion Council to encourage IPv6 adoption

A number of initiatives to promote IPv6 have been launched, including a scheme to allocate cows with their own IPv6 address so they can be tracked through the food chain

The government has also issued a mandate requiring agencies to purchase hardware and software systems that support IPv6

The Malaysian government established the National Advanced IPv6 Centre (NAv6)

It serves as the national centre for IPv6 research, human resource development and monitoring of IPv6 developments for Malaysia

As part of its mission, NAv6 plans and implements appropriate programmes in order for Malaysia to be an IPv6-enabled nation by 2012

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Why are organisations hesitant to invest in IPv6?

Service providers

- Difficulty justifying the business case to upgrade, as no additional revenue will be generated by IPv6 services

- Generally, either ready to provide IPv6 services or have plans

- More top-tier Internet applications migrating, but this is still only a small percentage

End user organisations

- Little interest in IPv6 services except from universities which have lead the adoption of IPv6

- Happy using IPv4 with RFC 1918 IP address space, using network address translation at the network perimeter

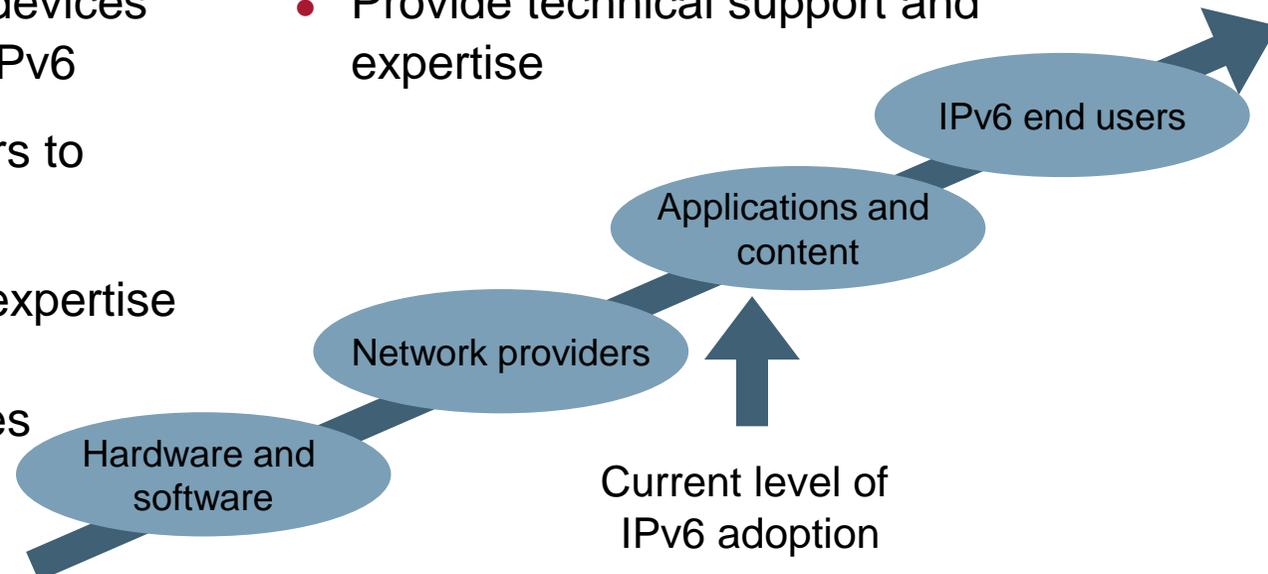- Perceive little benefit and significant costs

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The steps to promote the adoption of IPv6

With service providers

- Mandate that defined IPv6 services have to be available by a specific date

- Mandate that all government departments should be operating IPv6 by a specific date

- Mandate that all new smart devices and networks will use only IPv6

- Provide training and seminars to promote the benefit of IPv6

- Provide test facilitates and expertise to assist service providers in delivering the correct services

With end users

- Provide training and increase awareness to assist organisations in understanding the migration to IPv6

- Create IPv6 migration models to assist government and businesses

- Provide technical support and expertise

IPv6 end users

Applications and content

Network providers

Hardware and software

Current level of IPv6 adoption

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