Requirements for IPv6 in Government

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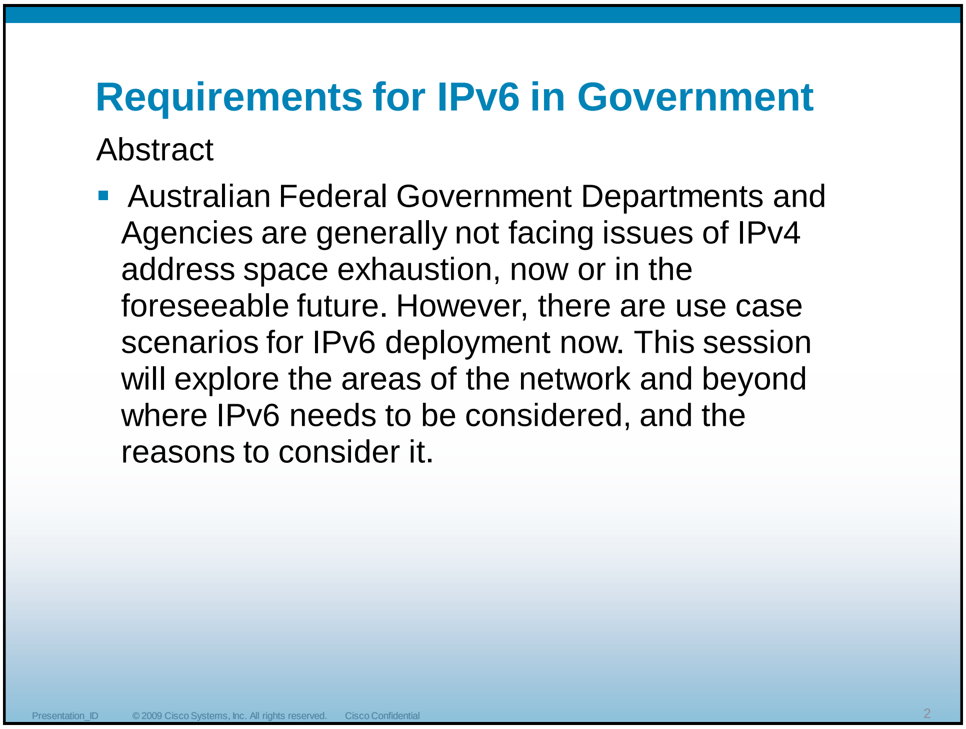
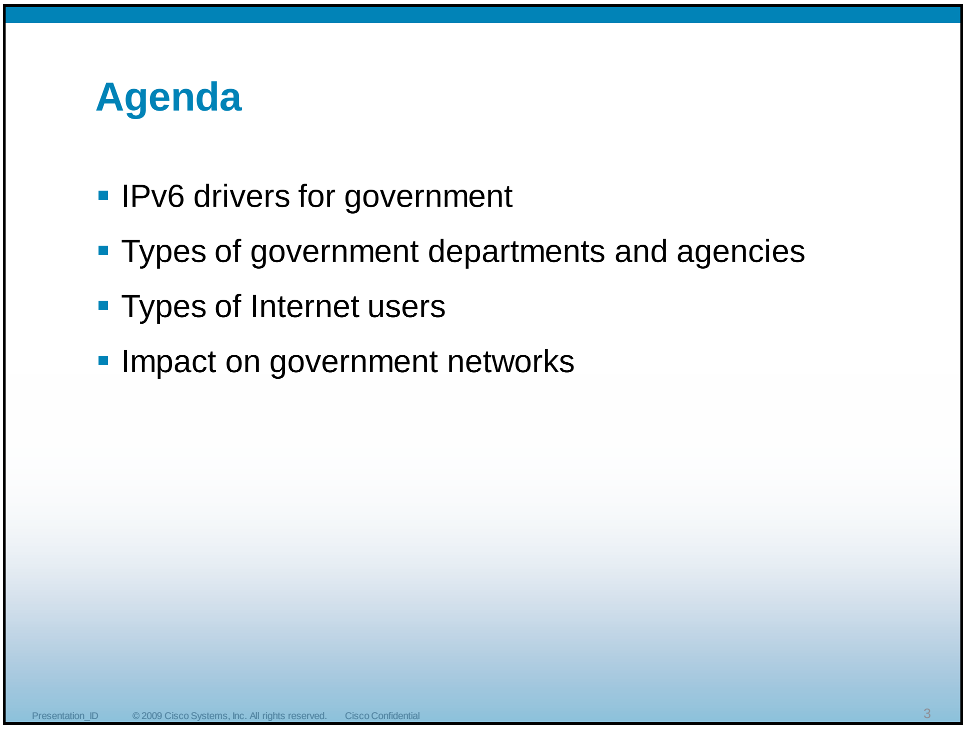


Requirements for IPv6 in Government

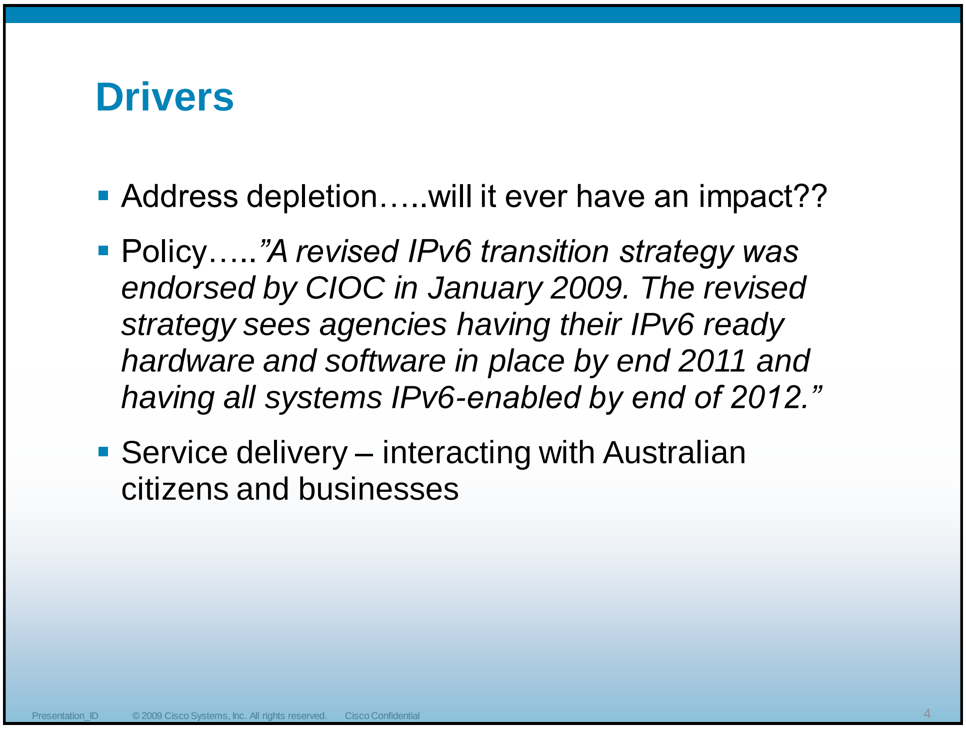
Abstract

- Australian Federal Government Departments and Agencies are generally not facing issues of IPv4 address space exhaustion, now or in the foreseeable future. However, there are use case scenarios for IPv6 deployment now. This session will explore the areas of the network and beyond where IPv6 needs to be considered, and the reasons to consider it.



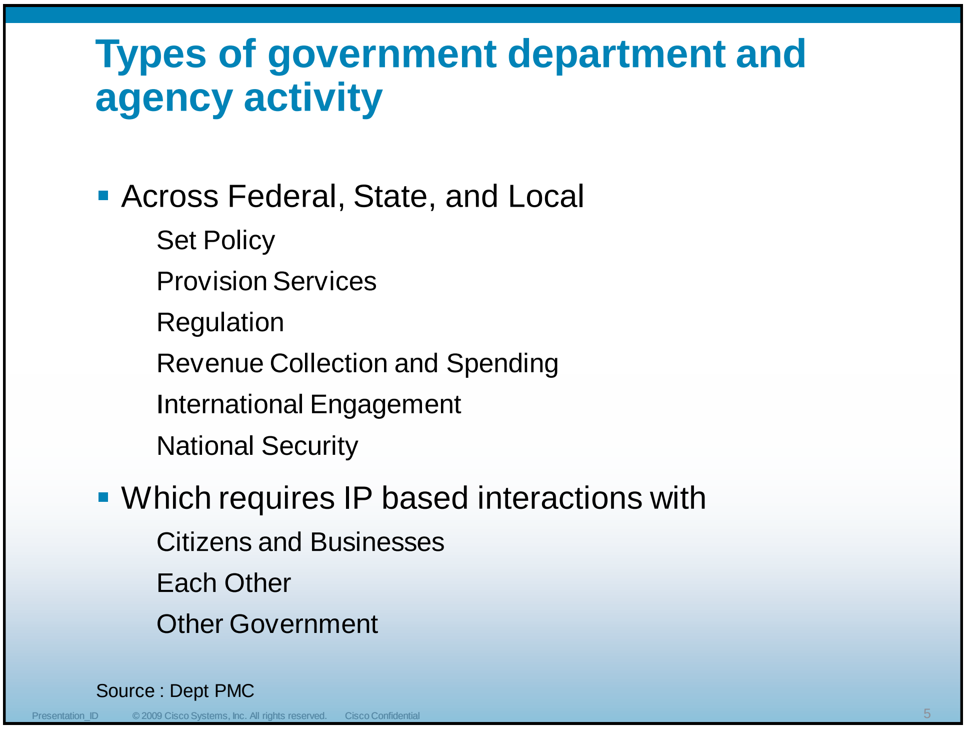
Agenda

- IPv6 drivers for government
- Types of government departments and agencies
- Types of Internet users
- Impact on government networks



Drivers

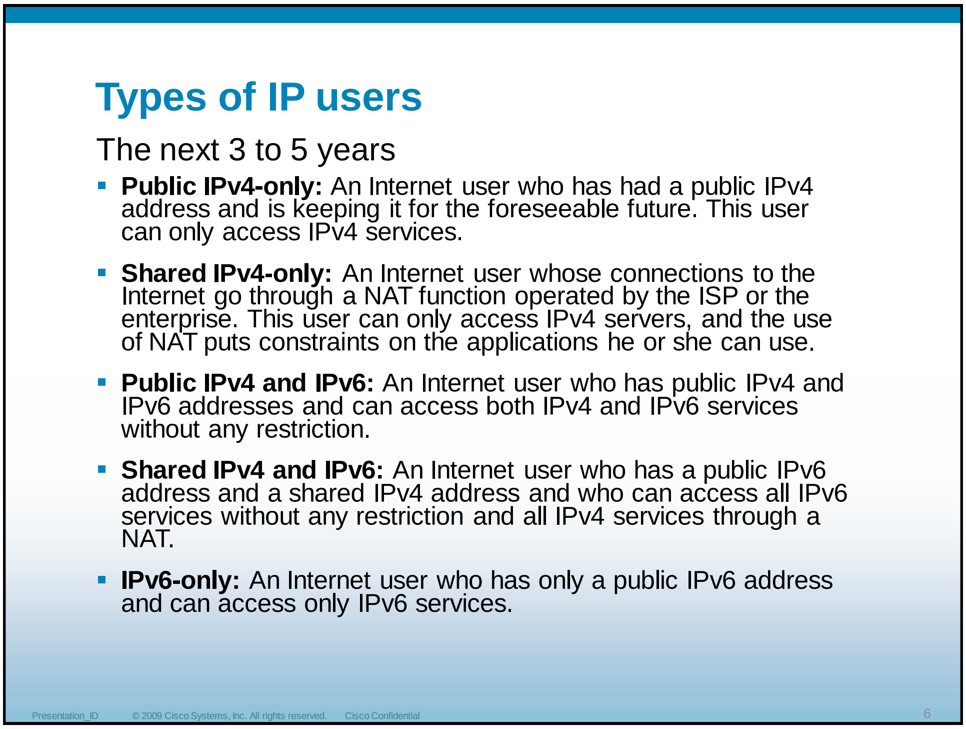
- Address depletion…..will it ever have an impact??
- Policy…..*”A revised IPv6 transition strategy was endorsed by CIOC in January 2009. The revised strategy sees agencies having their IPv6 ready hardware and software in place by end 2011 and having all systems IPv6-enabled by end of 2012.”*
- Service delivery – interacting with Australian citizens and businesses



Types of government department and agency activity

- Across Federal, State, and Local
  - Set Policy
  - Provision Services
  - Regulation
  - Revenue Collection and Spending
  - International Engagement
  - National Security
- Which requires IP based interactions with
  - Citizens and Businesses
  - Each Other
  - Other Government

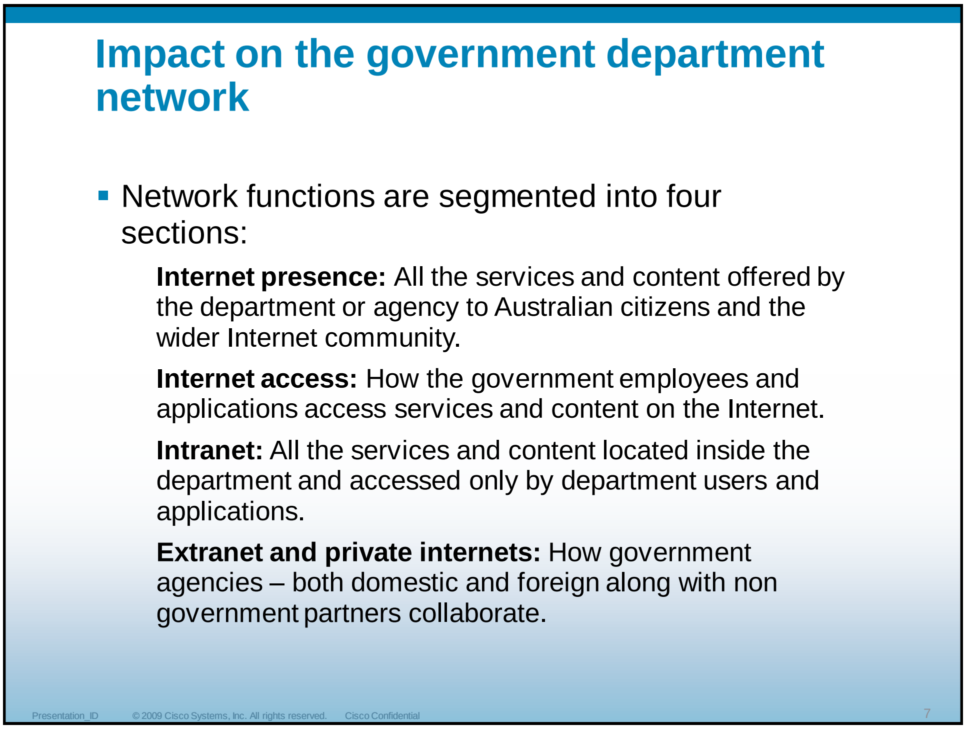
Source : Dept PMC



Types of IP users

The next 3 to 5 years

- **Public IPv4-only:** An Internet user who has had a public IPv4 address and is keeping it for the foreseeable future. This user can only access IPv4 services.
- **Shared IPv4-only:** An Internet user whose connections to the Internet go through a NAT function operated by the ISP or the enterprise. This user can only access IPv4 servers, and the use of NAT puts constraints on the applications he or she can use.
- **Public IPv4 and IPv6:** An Internet user who has public IPv4 and IPv6 addresses and can access both IPv4 and IPv6 services without any restriction.
- **Shared IPv4 and IPv6:** An Internet user who has a public IPv6 address and a shared IPv4 address and who can access all IPv6 services without any restriction and all IPv4 services through a NAT.
- **IPv6-only:** An Internet user who has only a public IPv6 address and can access only IPv6 services.



Impact on the government department network

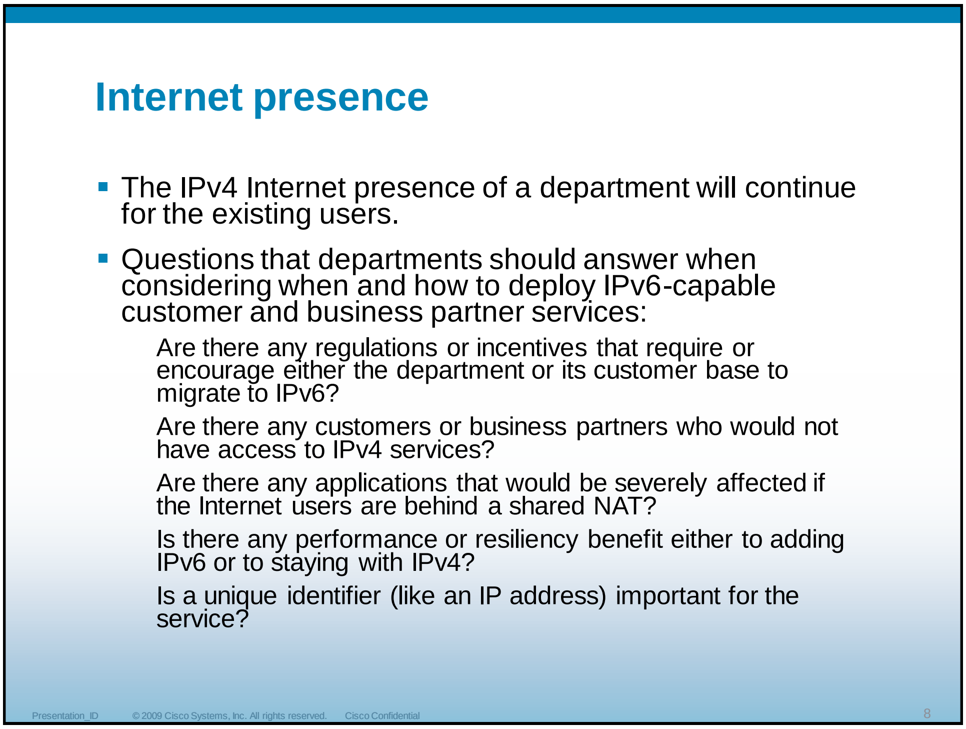
- Network functions are segmented into four sections:

  Internet presence: All the services and content offered by the department or agency to Australian citizens and the wider Internet community.

  Internet access: How the government employees and applications access services and content on the Internet.

  Intranet: All the services and content located inside the department and accessed only by department users and applications.

  Extranet and private internets: How government agencies – both domestic and foreign along with non government partners collaborate.



Internet presence

- The IPv4 Internet presence of a department will continue for the existing users.
- Questions that departments should answer when considering when and how to deploy IPv6-capable customer and business partner services:

  Are there any regulations or incentives that require or encourage either the department or its customer base to migrate to IPv6?

  Are there any customers or business partners who would not have access to IPv4 services?

  Are there any applications that would be severely affected if the Internet users are behind a shared NAT?

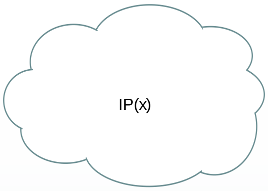
  Is there any performance or resiliency benefit either to adding IPv6 or to staying with IPv4?

  Is a unique identifier (like an IP address) important for the service?

Internet presence

Service delivery examples – DFAT Smartraveller

Australian holidaying overseas
Using IPv6 Internet Cafe or Mobile provider



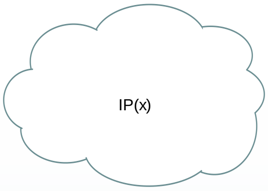
smartraveller.gov.au
A must see destination.
Home
Travel advice
Travel bulletins
Register
Smartraveller
The Australian Government's travel advisory and consular information service.

Department of Foreign Affairs and Trade.
Smartraveller advice

Internet presence

Service delivery examples – ATO e-TAX

Australian Tax Payer



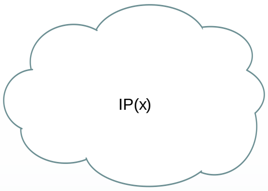
Time is running out…
Lodge your 2009–10 income tax return online by 31 October

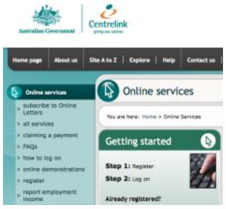
Australian Taxation Officer
e-Tax

Internet presence

Service delivery examples – Centrelink Family Benefits

Australian citizen
Family Benefits recipient

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Getting started

Step 1: Register
Step 2: Log on

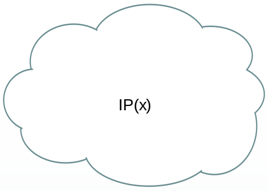
Already registered?

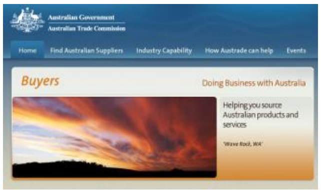
Department of Human Services
Centrelink Services

Internet presence

Service delivery examples – AUSTRADE

Overseas manufacture
IPv6 Business Portal

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Australian Trade Commision
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Internet Access

Why use IPv6 to access the Internet

- When renumbering from private IPv4 is required.
- When governments require or encourage enterprises to move to IPv6.
- When the enterprise has only a shared IPv4 address behind a service provider NAT and wants to offer a better service to the internal IPv6 users by eliminating the IPv4 NAT issues for those users.
- When some customers, partners, or external devices require the use of IPv6 for communication.
- When the enterprise can not obtain IPv4 addresses (public or privately translated) to enable connection to the IPv4 Internet.
- When there is a need to develop an understanding of use and operations of the new IPv6 protocol.
- When the acquisition or maintenance cost of IPv4 connectivity becomes prohibitive – for the department or the service provider

Internet Access

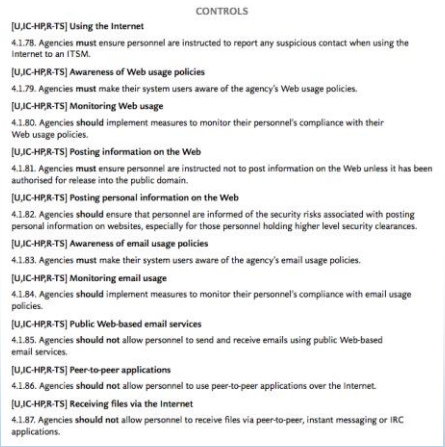
But would IPv6 be end to end anyway?

- In the IPv4 world…

  Web proxy

  Email proxy

  Application firewalls
- There are limited (or no) end to end IPv4 connections
- Extranets at the same security classification could be proxy free?



CONTROLS

[U,IC-HP,R-TS] Using the Internet

4.1.78. Agencies **must** ensure personnel are instructed to report any suspicious contact when using the Internet to an ITSM.

[U,IC-HP,R-TS] Awareness of Web usage policies

4.1.79. Agencies **must** make their system users aware of the agency's Web usage policies.

[U,IC-HP,R-TS] Monitoring Web usage

4.1.80. Agencies **should** implement measures to monitor their personnel's compliance with their Web usage policies.

[U,IC-HP,R-TS] Posting information on the Web

4.1.81. Agencies **must** ensure personnel are instructed not to post information on the Web unless it has been authorised for release into the public domain.

[U,IC-HP,R-TS] Posting personal information on the Web

4.1.82. Agencies **should** ensure that personnel are informed of the security risks associated with posting personal information on websites, especially for those personnel holding higher level security clearances.

[U,IC-HP,R-TS] Awareness of email usage policies

4.1.83. Agencies **must** make their system users aware of the agency's email usage policies.

[U,IC-HP,R-TS] Monitoring email usage

4.1.84. Agencies **should** implement measures to monitor their personnel's compliance with email usage policies.

[U,IC-HP,R-TS] Public Web-based email services

4.1.85. Agencies **should not** allow personnel to send and receive emails using public Web-based email services.

[U,IC-HP,R-TS] Peer-to-peer applications

4.1.86. Agencies **should not** allow personnel to use peer-to-peer applications over the Internet.

[U,IC-HP,R-TS] Receiving files via the Internet

4.1.87. Agencies **should not** allow personnel to receive files via peer-to-peer, instant messaging or IRC applications.

Source : Australian Government Information Security Manual 2009

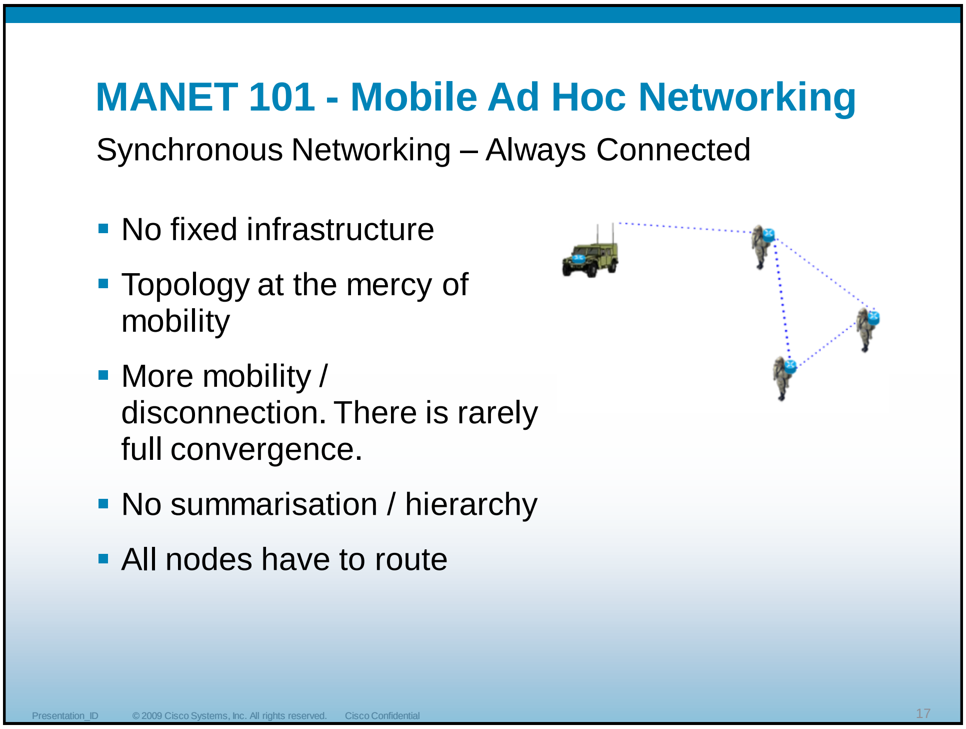
Intranet

- IPv4 address exhaustion only concerns the Internet and not the internal networks (the intranet) of most enterprises.
- Typically private IPv4 addresses (RFC 1918) internally perimeter NAT to access the Internet. There will be no reason for this to change when IPv4 addresses are no longer available.
- Internal applications will be able to use IPv4 for years even after the Internet stops using IPv4 and uses only IPv6.
- What other benefits besides address space?

Deployed and mobile intranets

Defence, National Security, Emergency Services, Transport, ……

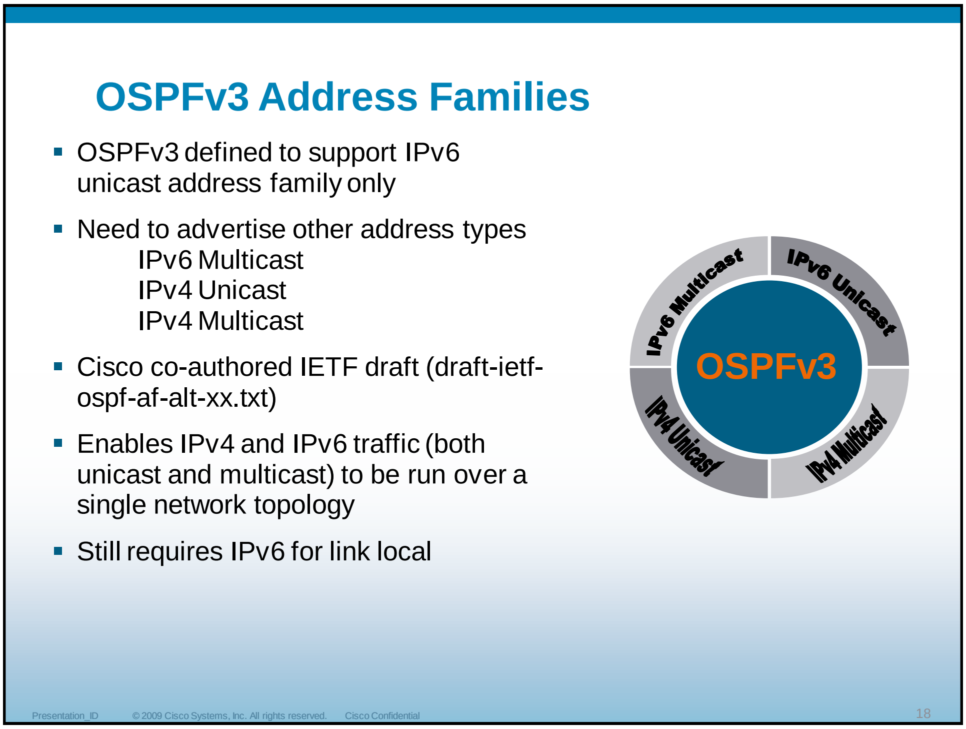
- Mobile infrastructure as opposed to mobile hosts present challenges for popular enterprise IGPs. eg OSPF
- Enterprise IGPs are designed for dynamic routing where nodes disappear and reappear in the same place
- Mobile IGPs are being developed for dynamic routing where nodes disappear and reappear somewhere else



MANET 101 - Mobile Ad Hoc Networking

Synchronous Networking – Always Connected

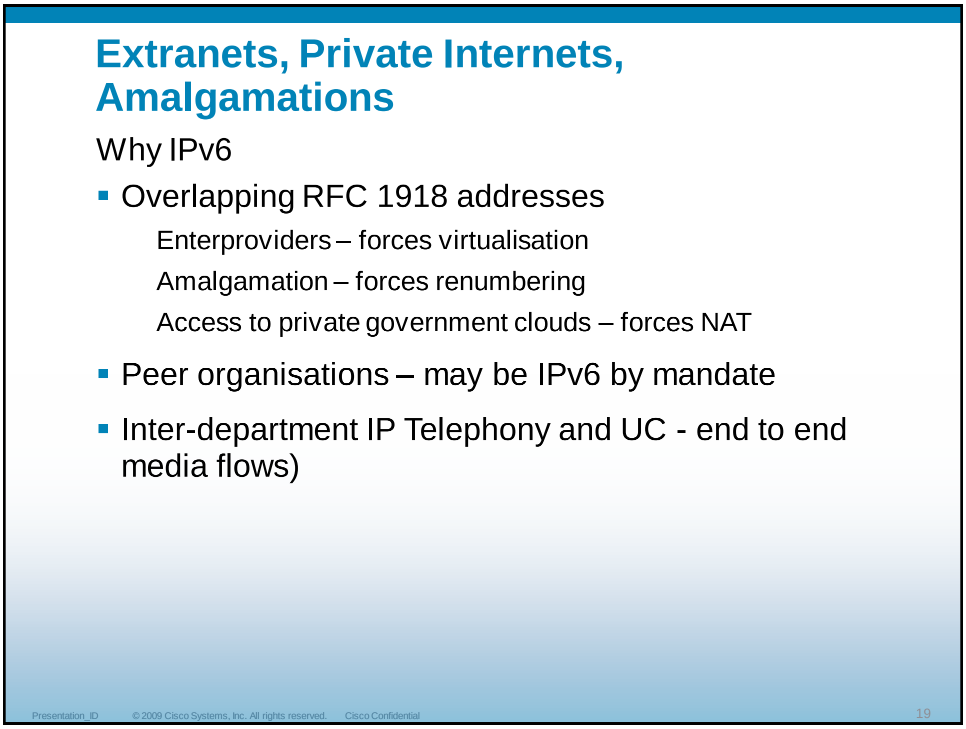
- No fixed infrastructure
- Topology at the mercy of mobility
- More mobility / disconnection. There is rarely full convergence.
- No summarisation / hierarchy
- All nodes have to route



OSPFv3 Address Families

- OSPFv3 defined to support IPv6 unicast address family only
- Need to advertise other address types
  IPv6 Multicast
  IPv4 Unicast
  IPv4 Multicast
- Cisco co-authored IETF draft (draft-ietf-ospf-af-alt-xx.txt)
- Enables IPv4 and IPv6 traffic (both unicast and multicast) to be run over a single network topology
- Still requires IPv6 for link local

IPv6 Multicast
IPv6 Unicast
OSPFv3
IPv4 Unicast
IPv4 Multicast



Extranets, Private Internets, Amalgamations

Why IPv6

- Overlapping RFC 1918 addresses

  Enterproviders – forces virtualisation

  Amalgamation – forces renumbering

  Access to private government clouds – forces NAT

- Peer organisations – may be IPv6 by mandate
- Inter-department IP Telephony and UC - end to end media flows)