





# IPv6 - An Orange Viewpoint

Stephen Hope  
Senior Consultant  
Orange PCSL



# Overview

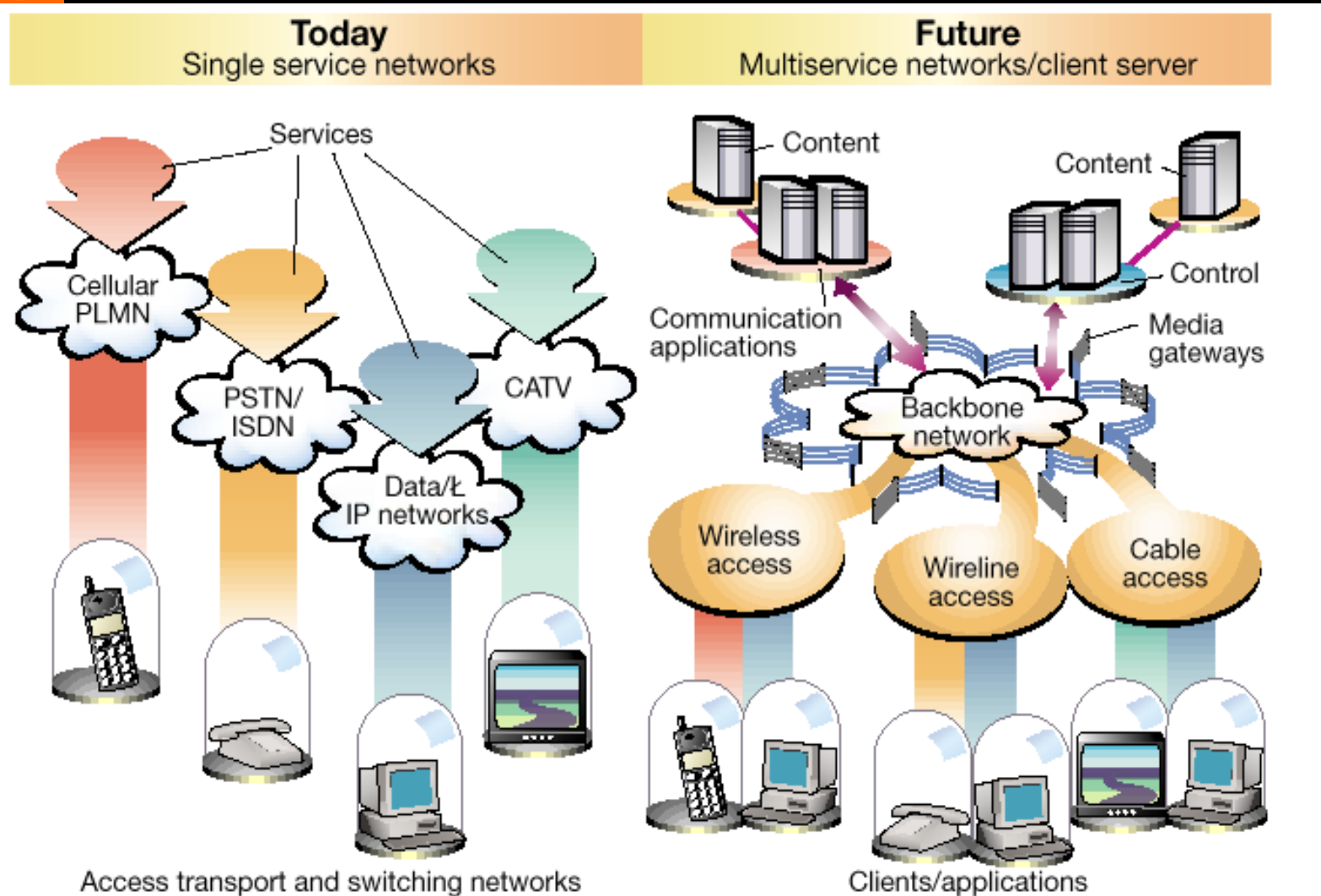
- Introduction
- IPv6 Drivers
- IPv6 Restraints
- Operational Issues
- Summary



# Introduction

- Orange are active participants in 3GPP
- IP is viewed as a key 3G technology
  - As a core network transport technology
  - For the delivery of personalised 2.5 and 3G Services
- Convergence of Telecom and Internet Technologies
- **Anytime Anyplace Anyhow**

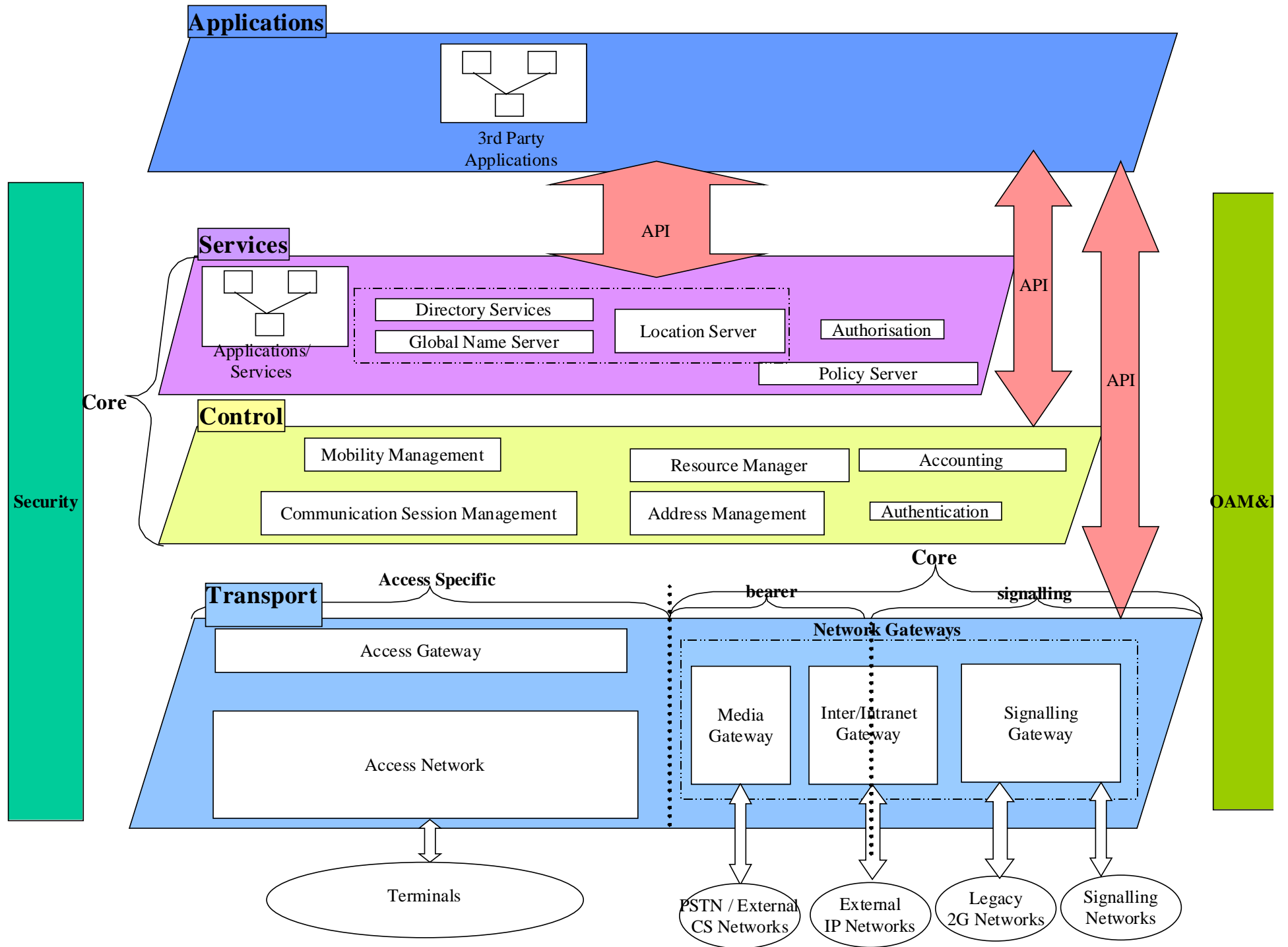
# Towards the Single Network ?





## The MWIF Vision

- Development of single network architecture supporting...
  - telephony, data, Internet, real-time services
  - multiple access technologies
  - rapid service creation and deployment
- Global migration towards target architecture





**Is IPv6 the best approach?**





# IPv6 Drivers and Restraints

- There are both driving forces and restraining factors for IPv6
- **For each driver or restraint a counter argument can be produced**



# IPv6 Drivers - Addressing

- Perceived world shortage of IPv4 addresses
- IPv6 offers significantly more than enough to suit any perceived need
- NAT already a proven concept in many IPv4 networks for handling IPv4 address shortage



## IPv6 Drivers - Mobility (Mobile IP)

- An add-on to IPv4 with certain inherent inefficiencies e.g triangular routing
- Efficient support of Mobile IP designed into IPv6 e.g. route optimisation
- Telecoms Networks already support mobility through specific techniques but IPv6 may prove useful in inter domain handovers



## IPv6 Drivers - Quality of Service (QoS)

- IPv4 poses difficulties for the delivery of such services as real time point to point video for example with no guarantee of constant bandwidth.
- IPv6 potentially contains more efficient support for real time services through the inclusion of flow control fields (although the use of these not yet fully agreed)
- Other applicable techniques to provide QoS already available or are being developed in other Standards bodies e.g. ETSI / TIPHON



## IPv6 Drivers - Security

- Security is particularly important in a mobile network
- IPv6 contains greater integration of Security features especially in relation to authentication during mobility than those implicit in IPv4
- Historically GSM has proved to be efficient from a security point of view at the air interface thus expectations with 3G mobile networks is high



# IPv6 Restraints - Inefficient Use of Resources

- Packet Header size is particularly pertinent for example in the carriage of voice where the packet sizes are of necessity small to minimise end-to-end delay
- IPv6 has typically a larger header than IPv4 potentially resulting in a higher overhead and lower bandwidth utilisation efficiency
- Various techniques to reduce the header size (header compression and header stripping) are being developed and it is quoted that the IPv6 header will reduce more efficiently than the IPv4 header



# IPv6 Restraints - Interworking Issues

- Early adopters of IPv6 will need to interwork with IPv4 networks
- Interworking is always costly and early adopters may bear a cost penalty for some time
- Various interworking methods have been developed (dual stack support, IPv6 tunnelling over IPv4 IPv4/IPv6 translation but the optimum approach may be different depending on the application.
- **Some further work is required.**



# IPv6 Operational Issues

- For Orange two operating environments to be considered
- Telecoms Environment
- Internet Environment





# Telecoms Environment

- IPv6 used as part of the core mobile network to deliver interconnect capability
- Private Networks to deliver Services at guaranteed QoS e.g B2B Corporate Services
- **Availability and Manageability are key factors**
- **Network is under Orange Control**



# Internet Environment

- Orange provides Services as an ISP (OrangeDot)
- Orange has no external control
- **Need to support Gateway Access from the internet for both IPv4 and IPv6 for some time**
  - **cost implications**
  - **interworking and translation issues to be resolved**



# Summary (1)

- There are both driving forces and restraining factors for IPv6
- For each driver or restraint a counter argument can be produced
- Much Network equipment has IPv6 enabled
- IPv6 highly likely to become pervasive within the core networks of Mobile Operators as well as the internet



## Summary (2)

- Concerns over system reliability in a Telecoms environment
- Limited availability of support for IPv6 on Terminal Equipment is an issue
- Identification of the best method of adaptation of the protocol to allow effective use where transmission resources are constrained is also an Issue



# The IPv6 Taskforce

- While Orange view IPv6 as the most likely way ahead for future networks Orange still have a number of issues which will need to be addressed before committing IPv6 to an operational environment
- **However rather than remaining outside we believe participation in the Task Force offers the way to resolve such issues by working in partnership with all interested parties**



**thanks**