



International Telecommunication Union



Creating Enhanced Services with IPv6

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Agenda

- Intro: IPv6 in Mobile Networks
- IPv6 Personal Area Networks
- IMS (IP Multimedia) over IPv6
- Access Network Requirements
- A real IPv6 application: Pushv6
- Summary

How can we use IPv6 to create new services?

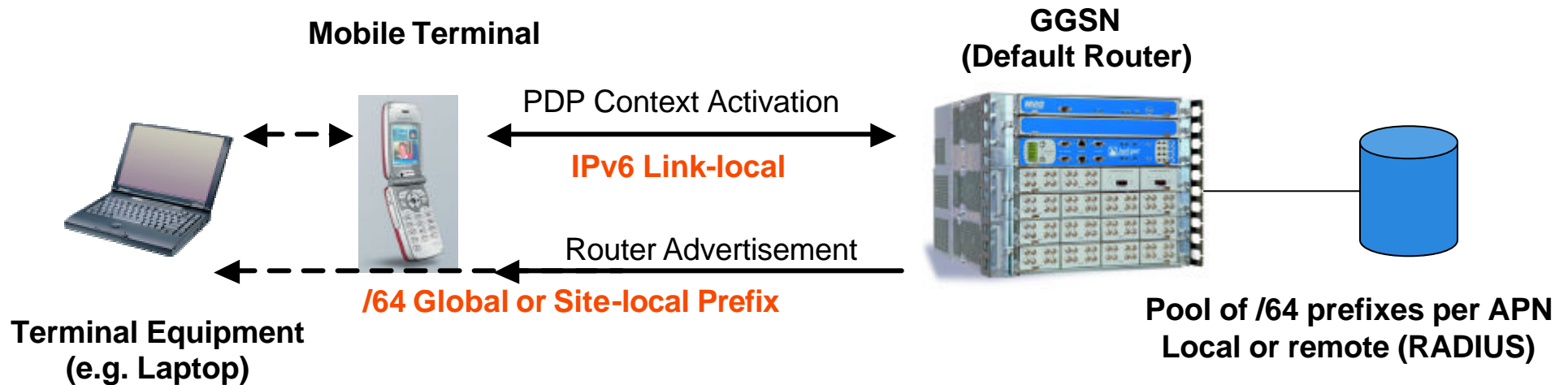
- Mobile Subscriptions have surpassed Fixed network subscriptions
- Mobile Data Services are still underutilised: potential new revenue streams
- Not enough public IPv4 addresses for mobile users
Need a long-term solution for continued market growth
- Mobile-to-Mobile services can be successful in driving data services like fixed peer-to-peer services on Internet



Introducing IPv6 in Mobile Networks

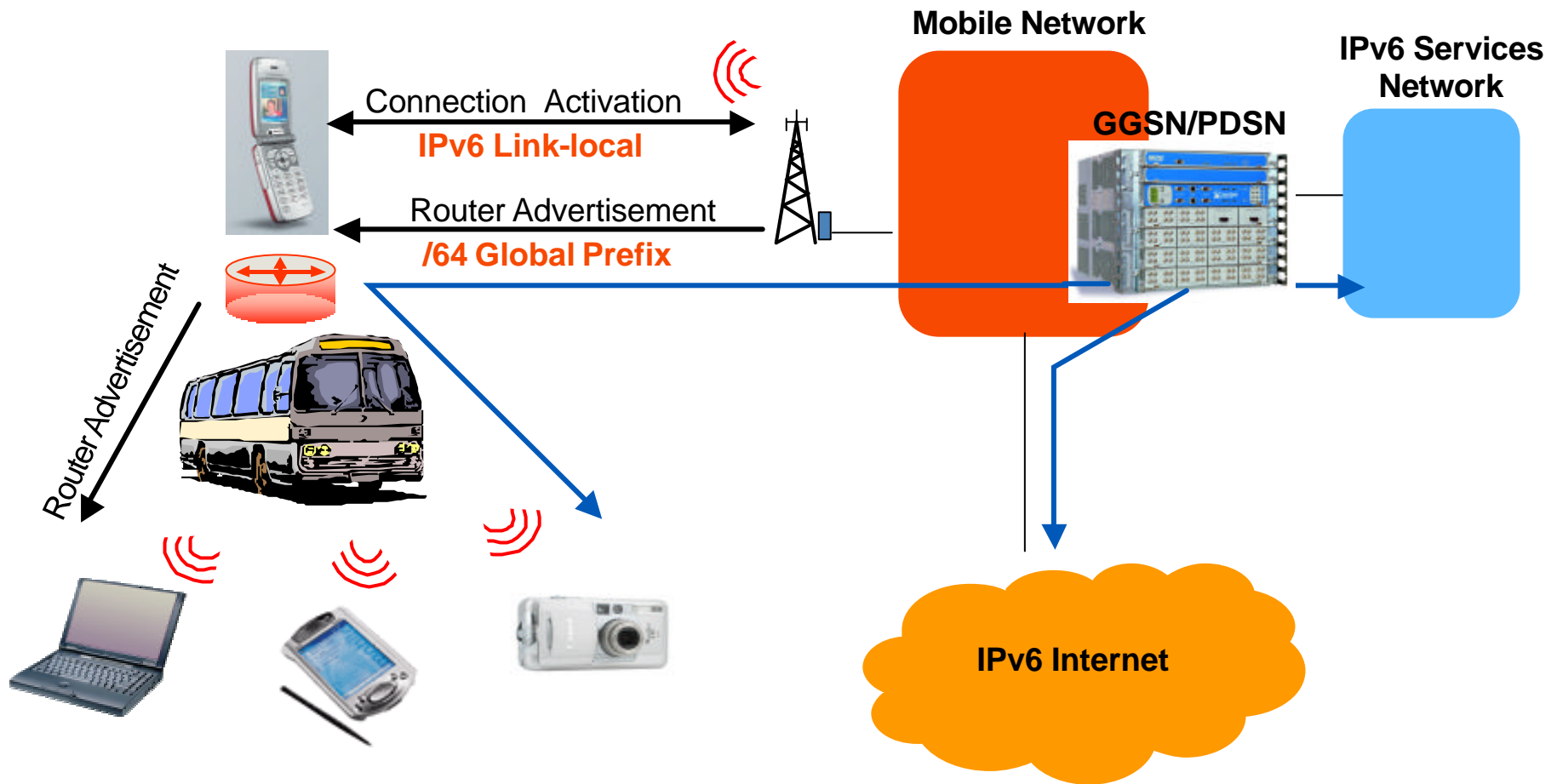
- Introduce IPv6 in the network early
 - Gain experience and get O&M procedures in place
- Try out new services on IPv6 without disrupting existing IPv4 network
 - Gradual introduction
- Introduce IPv6 at the “user” or “application” layer first
 - IPv6 as a service enabler, providing IPv6 connectivity for end-user services and applications
 - Stimulate application development

How are IPv6 addresses assigned to Mobiles?

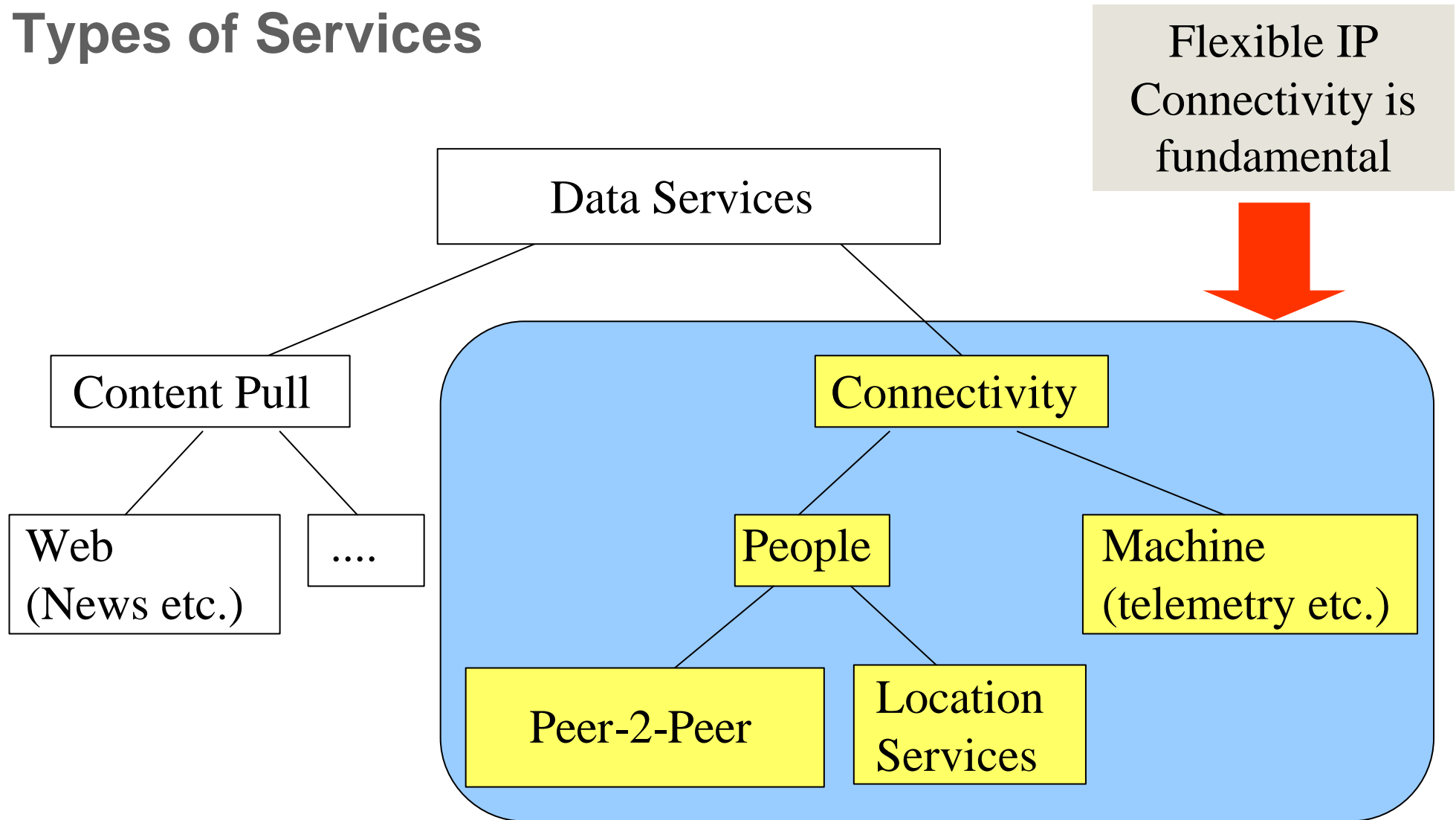


- IETF/3GPP successful collaboration produced future-proof IPv6 standard for Mobile Networks
- Mobile host's Link-local address provided by GGSN to avoid duplication
- Each Mobile Terminal is assigned a unique /64 IPv6 prefix which can be used to create multiple addresses (privacy), [Personal Area Networks](#) etc.
- Unreliable DAD may be avoided (reduces messages over air)

How does IPv6 enable Moving Networks?

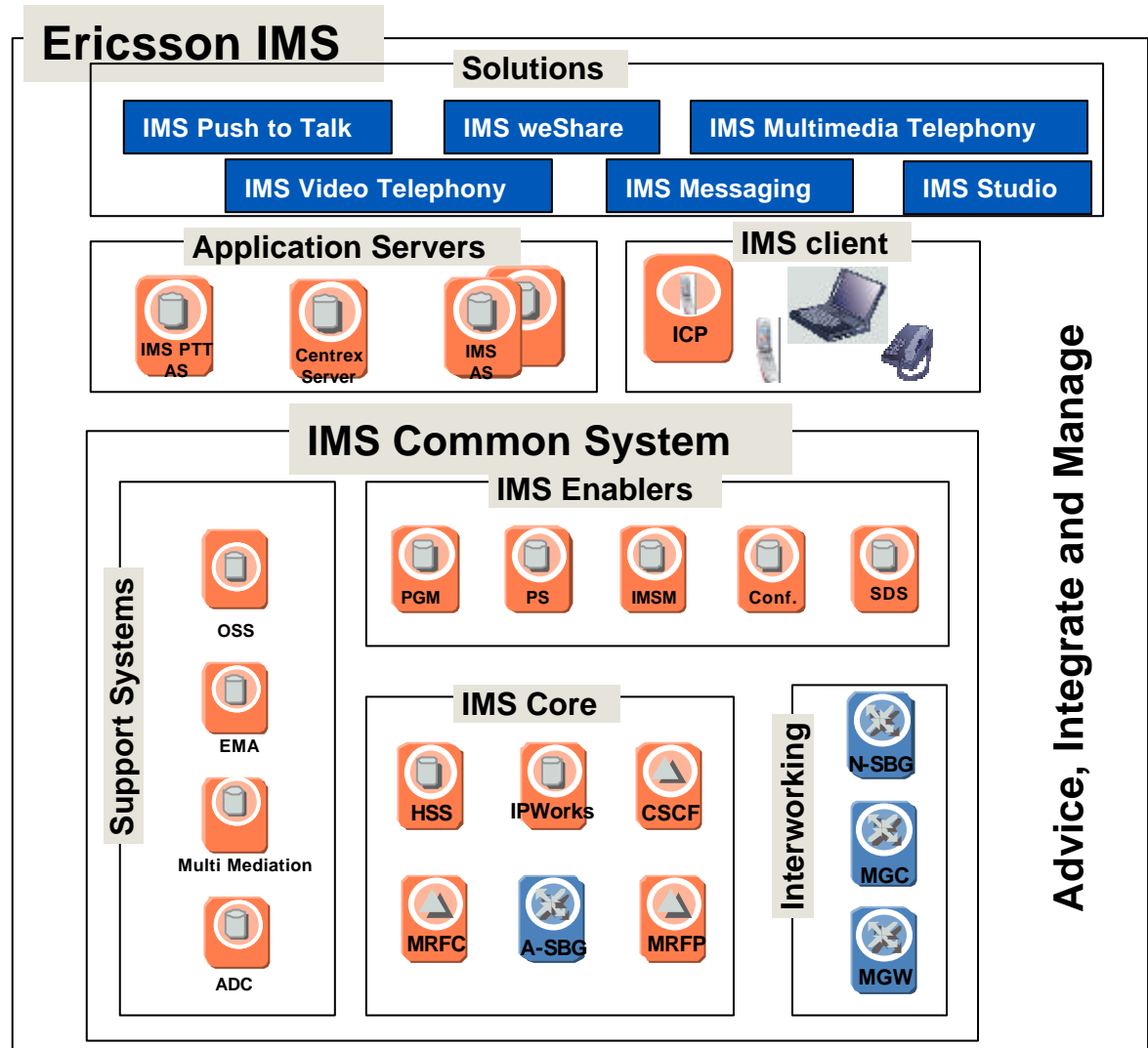


Types of Services



IMS Overview

- IMS is a horizontal architecture for offering IP Multimedia Applications
- IMS is defined in 3GPP/3GPP2 standard, Embraced in TISPAN
- The IMS architecture is based on the SIP-protocol for call-control in all IP-networks
- IMS supports different accesses, such as:
 - WCDMA, GPRS,
 - CDMA2000,
 - Wire-line Broadband
 - WLAN.

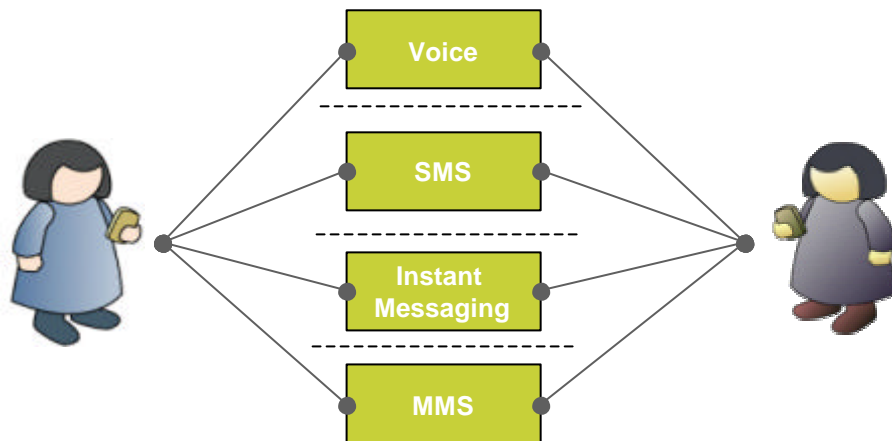


Ericsson implementation

Why IMS- end user perspective

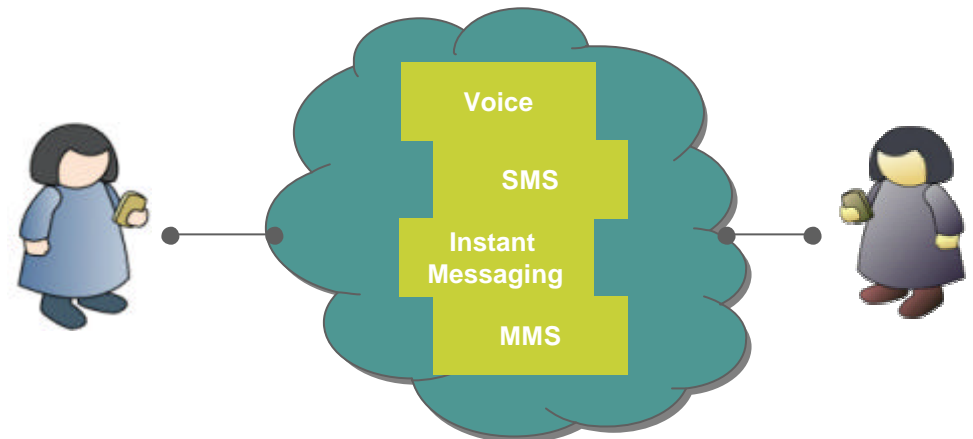
Simplified and richer communication

Pre-IMS Communication



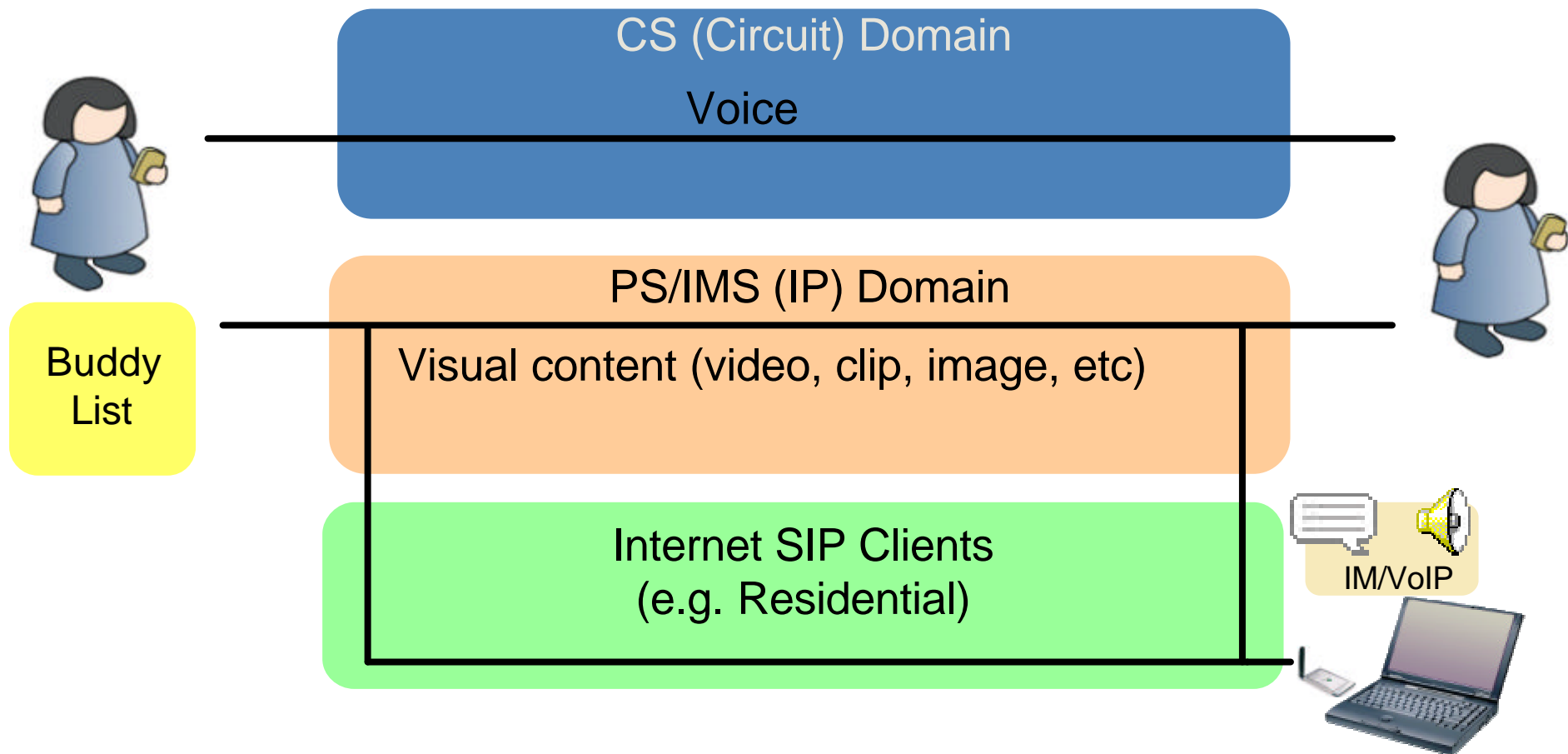
- 1 > Decide on communication mode/media
- 2 > Create content
- 3 > Send/call the chosen person
- 4 > Disconnect and reconnect if changing media

IMS Communication

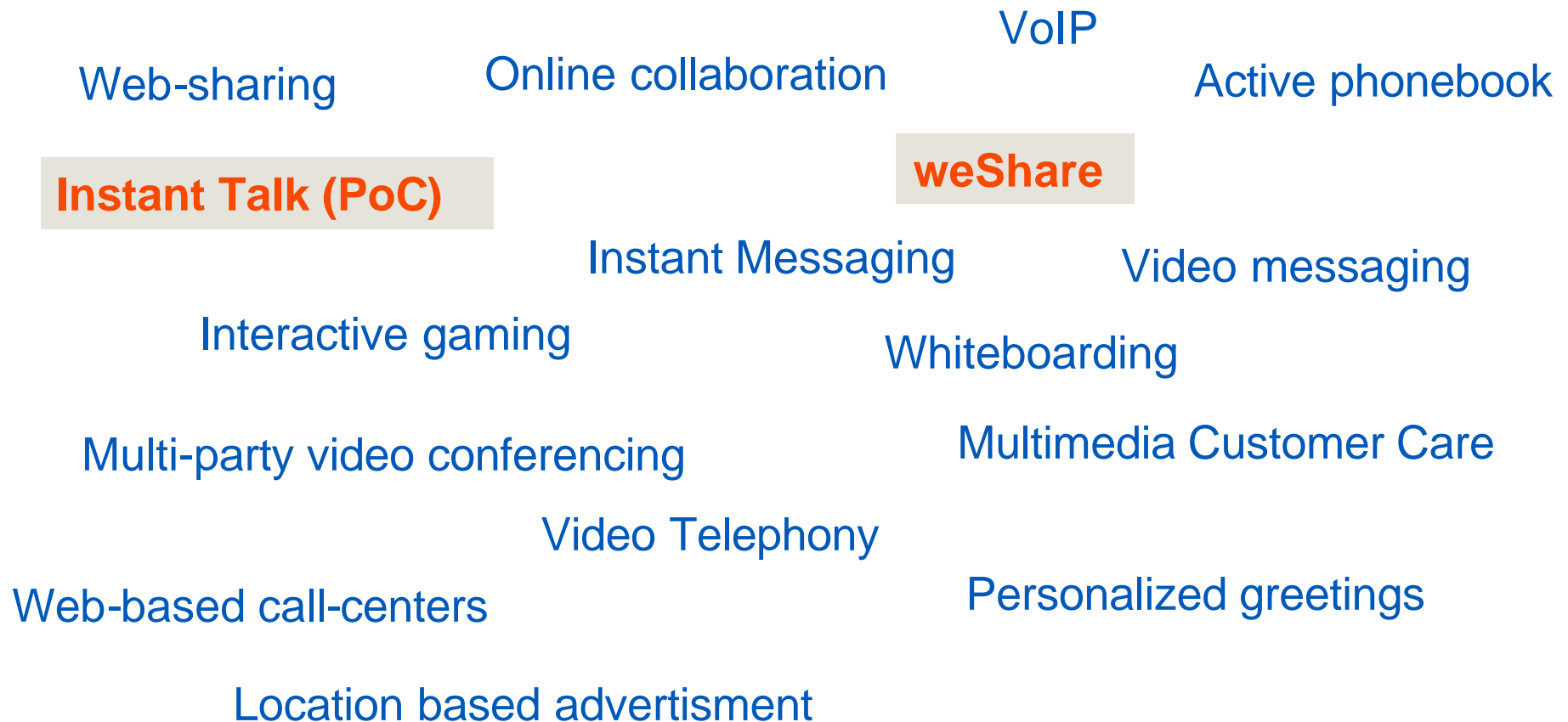


- 1 > See who is available beforehand (presence)
- 2 > See which mode/media to use
- 3 > Contact and create content
- 4 > Change media in real time

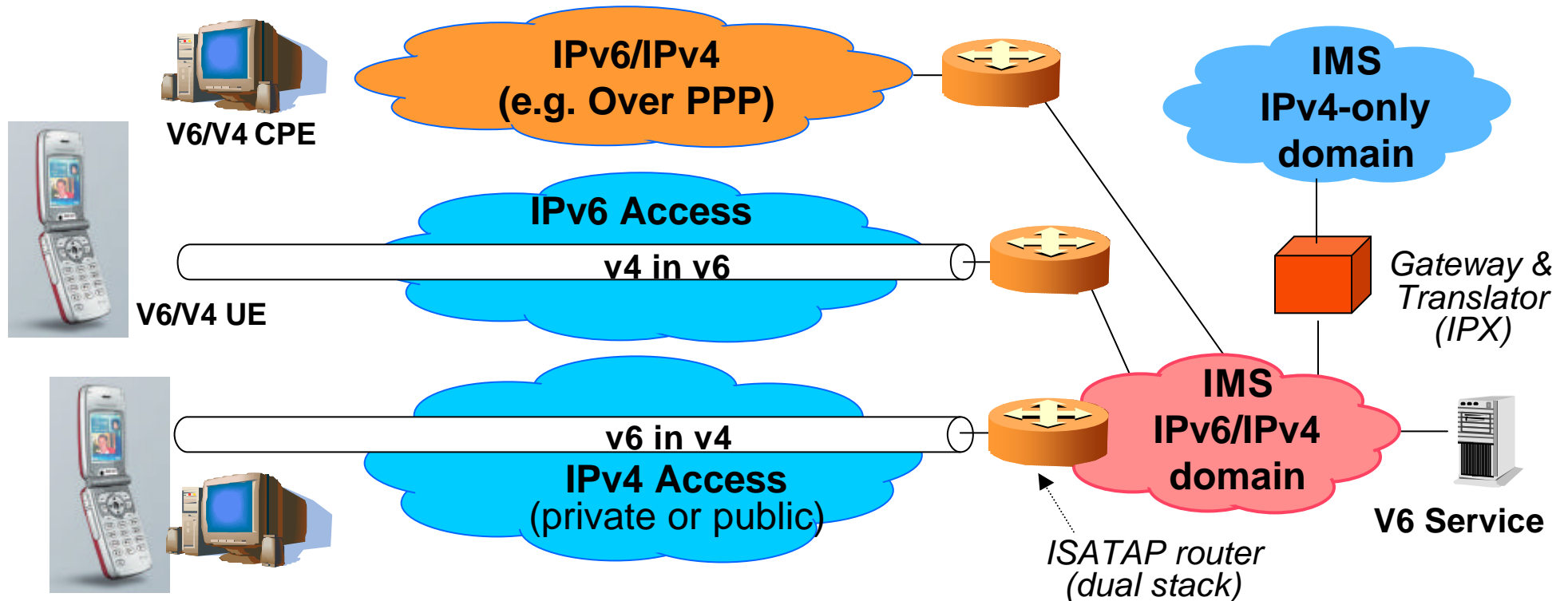
Application Opportunities: IMS for Combinational and Internet Services



Applications: the initial driver for IMS



Access Requirements for an IPv6-based IMS



- Fixed network: CPEs running IPv6 and IPv4 over PPP
- Mobile Network: Multiple Primary PDP Contexts or Tunnelling
- Tunnelling: IPv6-in-IPv4 (ISATAP) or IPv4-in-IPv6

SIP Support for IPv6-based IMS

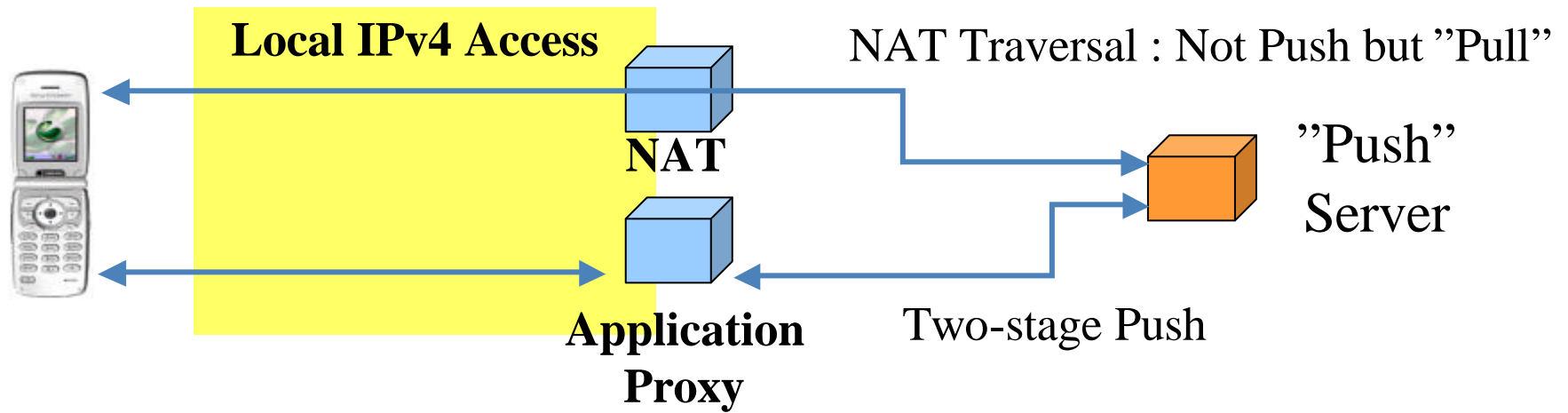
- SDP support
<http://www.ietf.org/rfc/rfc3266.txt>
- ANAT
<http://www.ietf.org/rfc/rfc4092.txt>
<http://www.ietf.org/rfc/rfc4091.txt>
- SIP UA (e.g. mobile terminal) may be registered using an IPv6 address but send media over IPv4 when it communicates with IPv4-only peers
- Translation: special case for IPv4-only domains
Session Policy-based
<http://standards.ericsson.net/karim/draft-elmalki-sipping-3gpp-translator-00.txt>

Pushv6: Example of a Real IPv6 Service

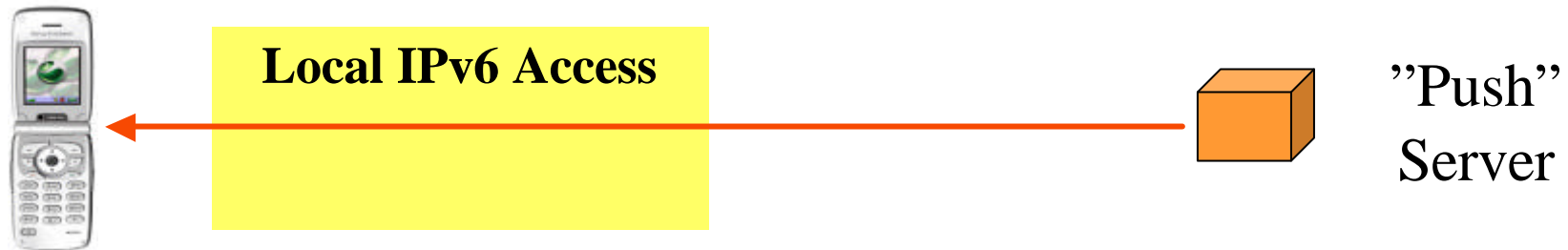
- There are many information and content providers in the market
- Many services are not well-suited to the “pull” model (i.e. “event-based” services such as news, broadcast messages etc.)
- Push is hard to implement with IPv4 -> LACK OF REACHABILITY USING PRIVATE ADDRESSES
- Currently some Push services are being done via SMS
 - Costly compared to GPRS data
 - Disturbance (phone beeps continuously as “news” is received!)
 - Puts excessive load on SMS instead of using the under-utilised Packet-switched capacity
- Push Features
 - User “pushes” info/multimedia to allowed user group (e.g. friends)
 - Content/Service Provider “pushes” info/multimedia to group of users according to their profile(e.g. News, Sports, Weather, Sell/Buy Ads)

Push "Reachability"

Current IPv4 Scenario



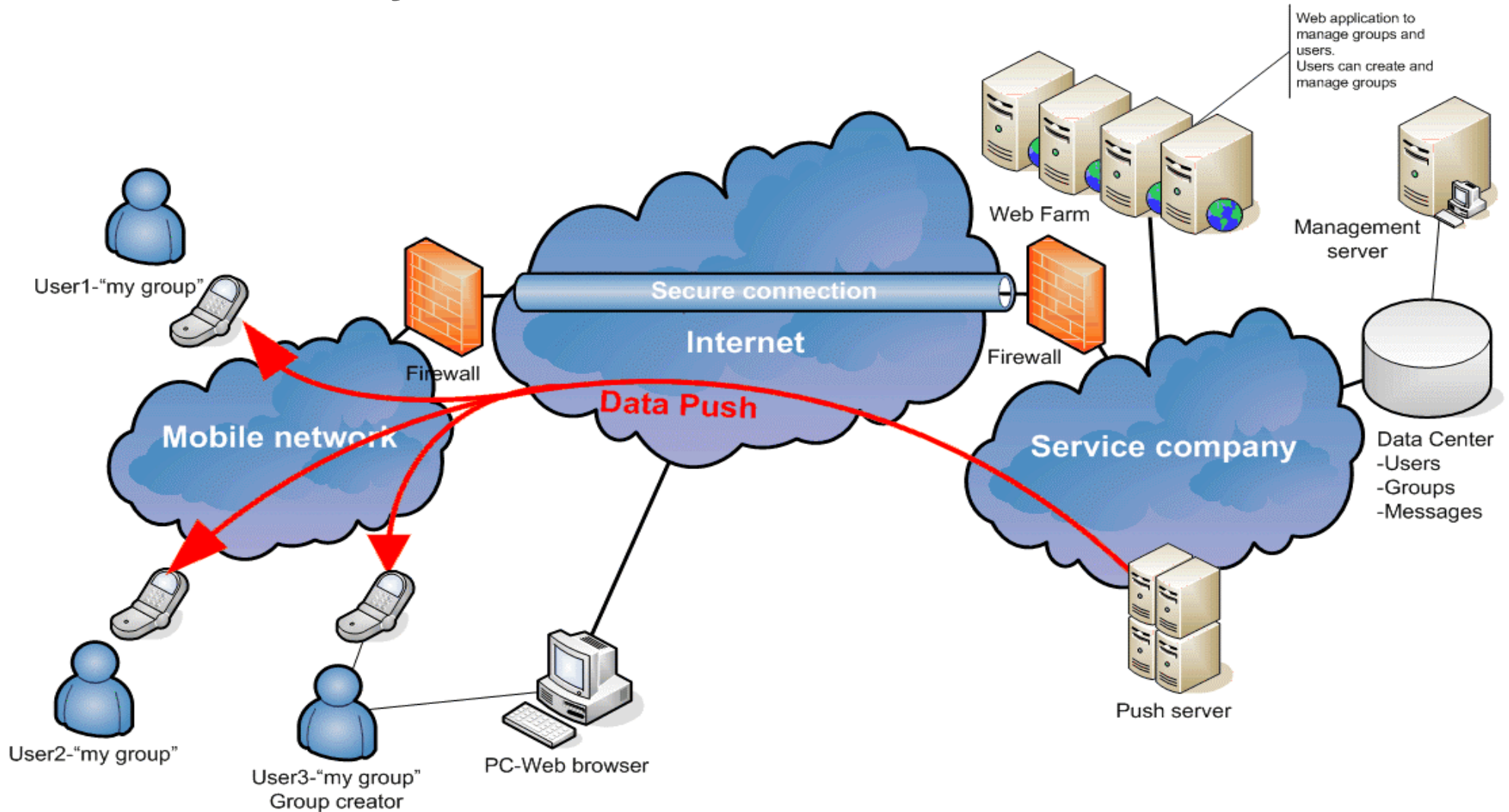
IPv6 "Real Push" Scenario



An IPv6 Application Example: Push (vs. Pull)

- Source of push messages are mobiles or content feeds (e.g. News)
- Low Service Costs for Mobile Operator (costs are on service provider)
- Profits through revenue sharing for 3rd Party Content
- Greater ability to manage service by Content/Services Company
- Enables new services and business models
 - Advertisements aimed at user groups (advertiser pays)
 - Content Providers use their own marketing to attract new users which increases traffic and profits through revenue sharing
 - Person-to-Person or Group information sharing or Chatting
 - Creates User Communities which increases traffic
 - Information Push to machines (e.g. Bus, Taxi, info-booth, advertisement boards)

Push IPv6 System



IPv6 Push Application (Pushv6)

- Java J2ME MIDP 2.0 application
- Implemented on Ericsson Mobile Platform GPRS/UMTS Dual-Stack Test Terminal (full IPv6 support including Java Machine)
- Security Certificate installed on Terminal
- Advanced Networking Properties:
 - Senses if an IPv6 address is available
 - If IPv6 is available then it registers using over IPv6 and requests to receive data push on UDP
 - If IPv6 is not available then it registers over IPv4 and requests to receive data push over HTTPS
 - Stays “always-reachable” on IPv6 (PDP Context stays active)
 - Works both with native IPv6 or tunnelled connectivity



Pushv6 J2ME Client Screenshots

Modify User
Push Profile



Push messages
received

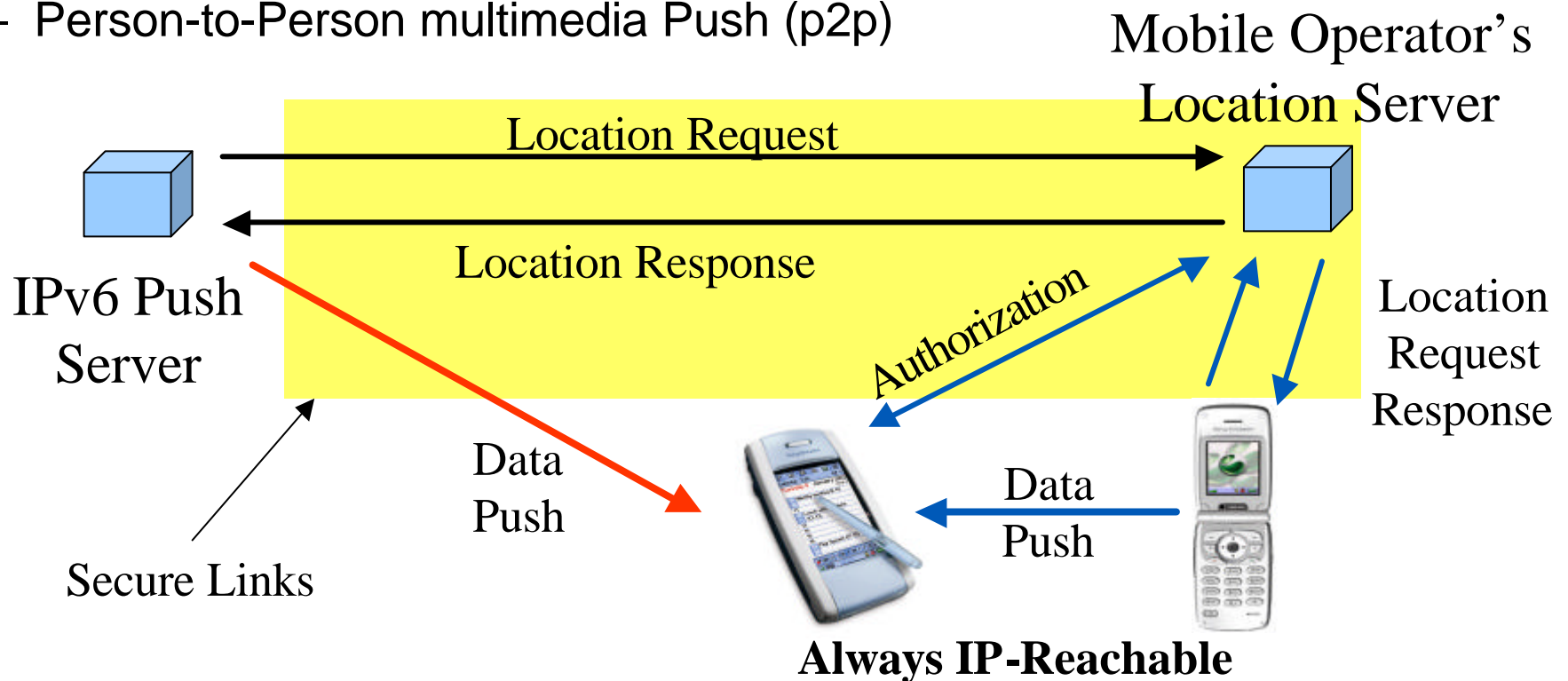


User Sends
Message to
Group "Fashion"



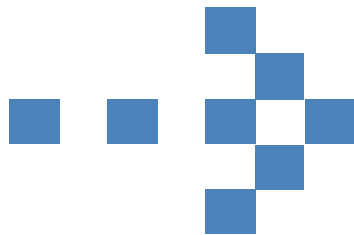
Next Steps: IPv6 Location-Based Applications

- Location-based Push
 - Push information related to where the user is located
Community info, localised commercial ad.s
 - Person-to-Person multimedia Push (p2p)



Summary

- Avoid the chicken-and-egg problem
 - Gradual introduction of IPv6
 - Start deploying & experimenting
- Work on new services that utilise the IPv6 “reachability” advantage
 - E.g. Pushv6: IPv6 “real push” information/multimedia
- IMS – huge potential
IPv6 is an enabler for next generation IMS services
e.g. mobile-to-mobile



**Thank you for your
attention**

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