International Telecommunication Union

Mobility vs Nomadicity

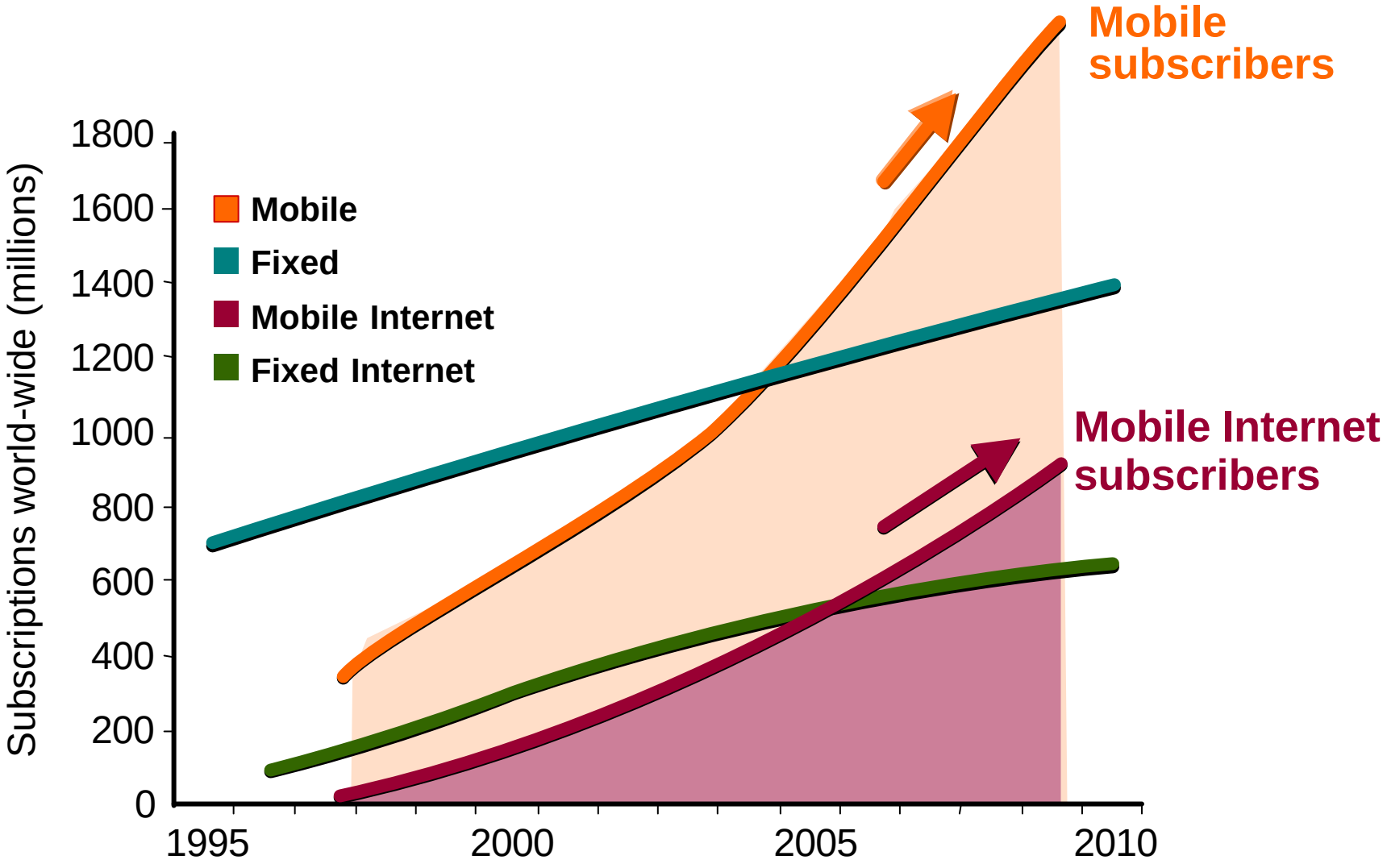
IETF protocols for Mobile Communications

Kiritkumar P Lathia, C. Eng., FIEE
ITU-T SG19 Vice Chairman

Vice President – Com Network Technologies
Standards & Fora
Siemens Mobile communications SpA, Italy

ITU-T Workshop on NGN (jointly organized with IETF)
Geneva, 1-2 May 2005

Mobile Communication used for everything, incl. internet access



Internet and the Nomadicity : Wireless Access on today's Internet

Internet "Mobility"

(= Wireless Access + Nomadicity)
("hotspot" usage + "roaming" ?

- **Lower A A A**
- **Lower Guaranteed QoS**
- **Regulatory Needs ?**
- **. . .**

Lesser Services

Mobility and the Internet : the Mobile communications view

ITU-T

Mobile Network with IP

(= Radio Access + Mobility)
Continuous availability at 160+ Km/h

- Lower A A A
- Lower Guarenteed QoS
- Regulatory Needs ?
- . . .

Lesser Services

- Ubiquity
- (high speed) Mobility
- Smarter Networks
- Smarter Terminals
- . . .

Any time
Any where
Any device

Authentication
Authorization
Accounting

IETF

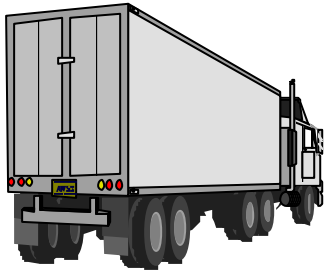
Dedicated terminals for services

Mobile computing equipment

- Heavy nomadic users with high bandwidth demand
- WWW, Internet/Intranet access, unified messaging

Mobile Smart Phone

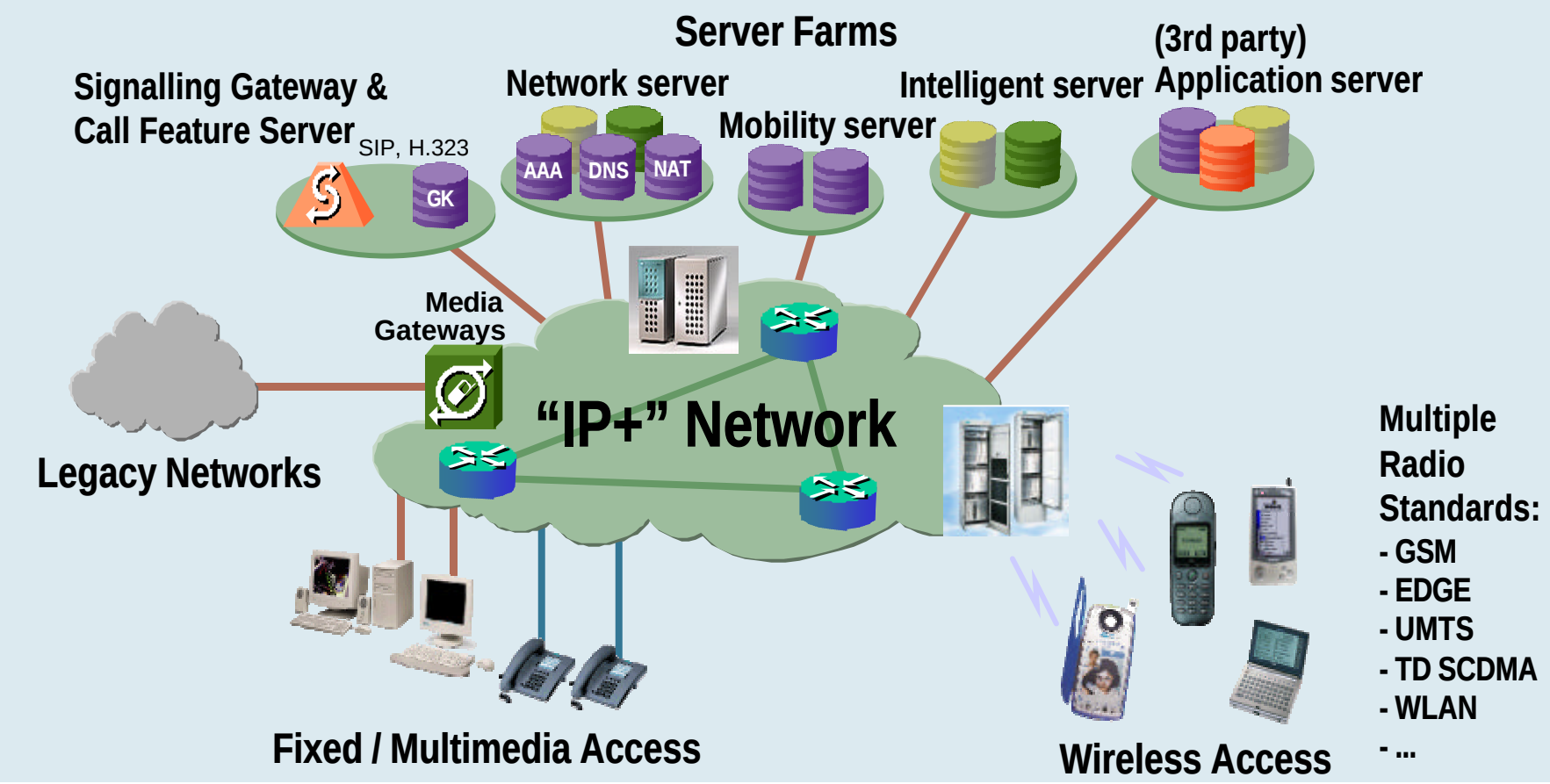
- Highly mobile users with moderate bandwidth demand
- info services, Location services, micro payment, MMS, ...



Data only Terminal

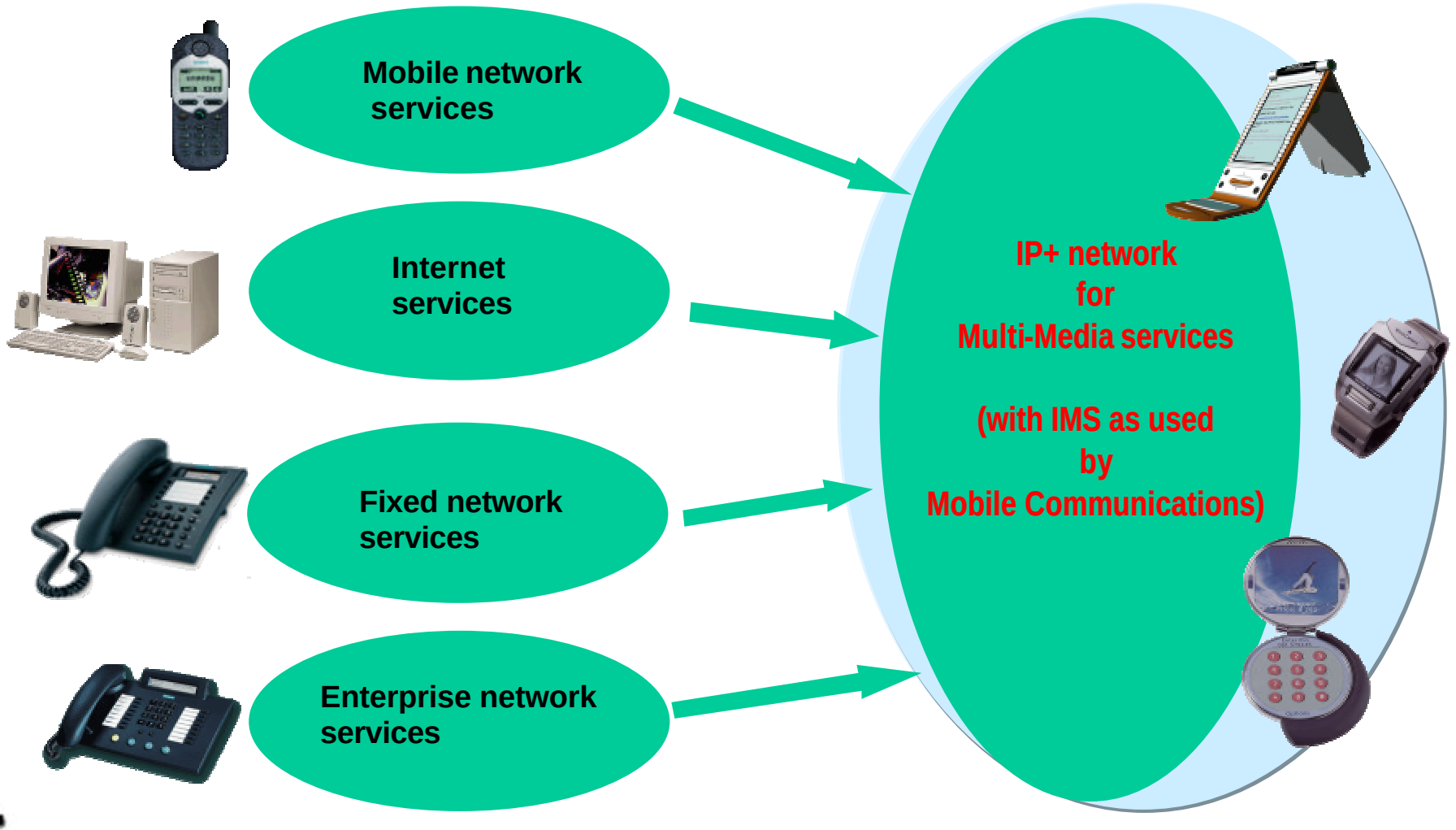
- occasional transfer
- Fleet Management, Telematics, Telemetrics, ...

Mobile (IP based) Network

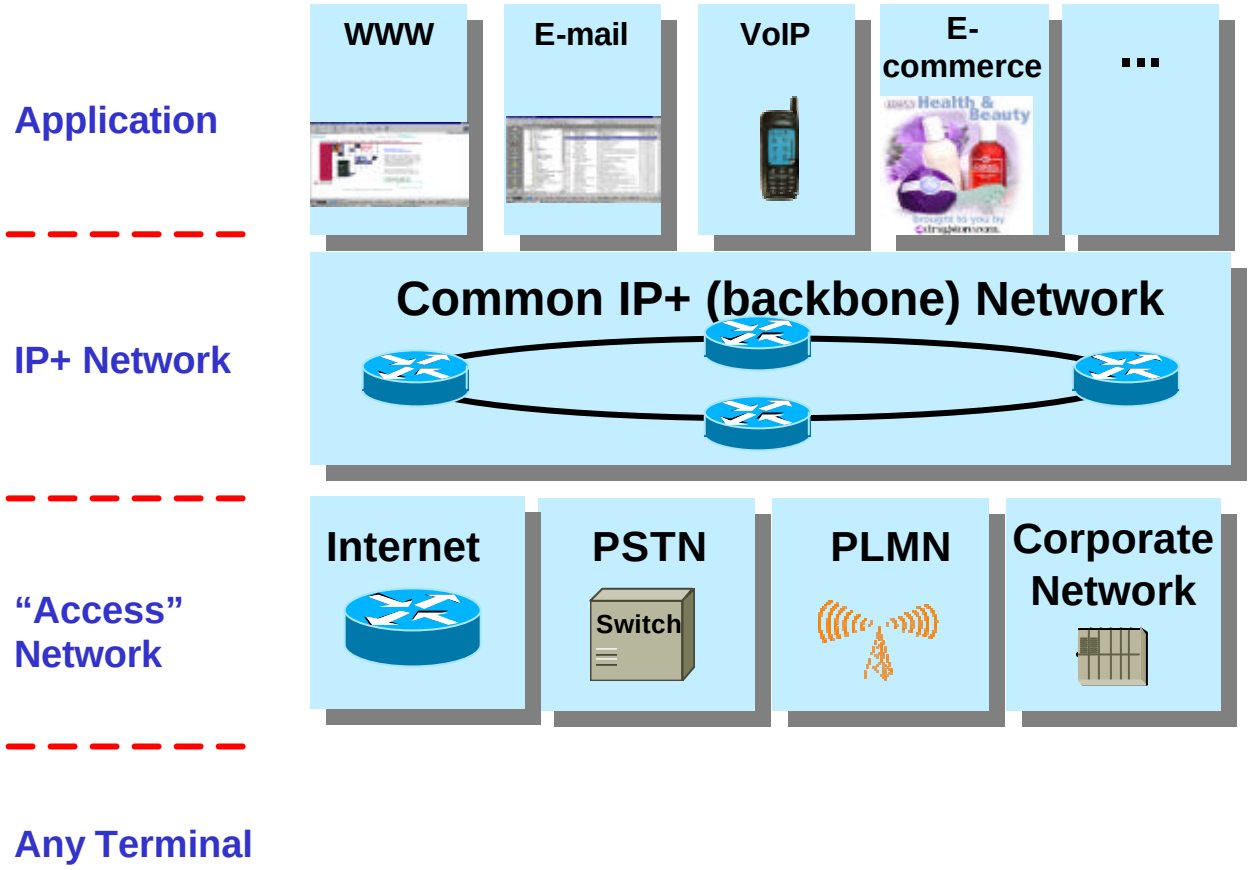


"IP+" means all necessary IETF protocols for network

Personalised Service Ubiquity
Key driver for network integration (FMC)



IP - Hides network infrastructure from the application



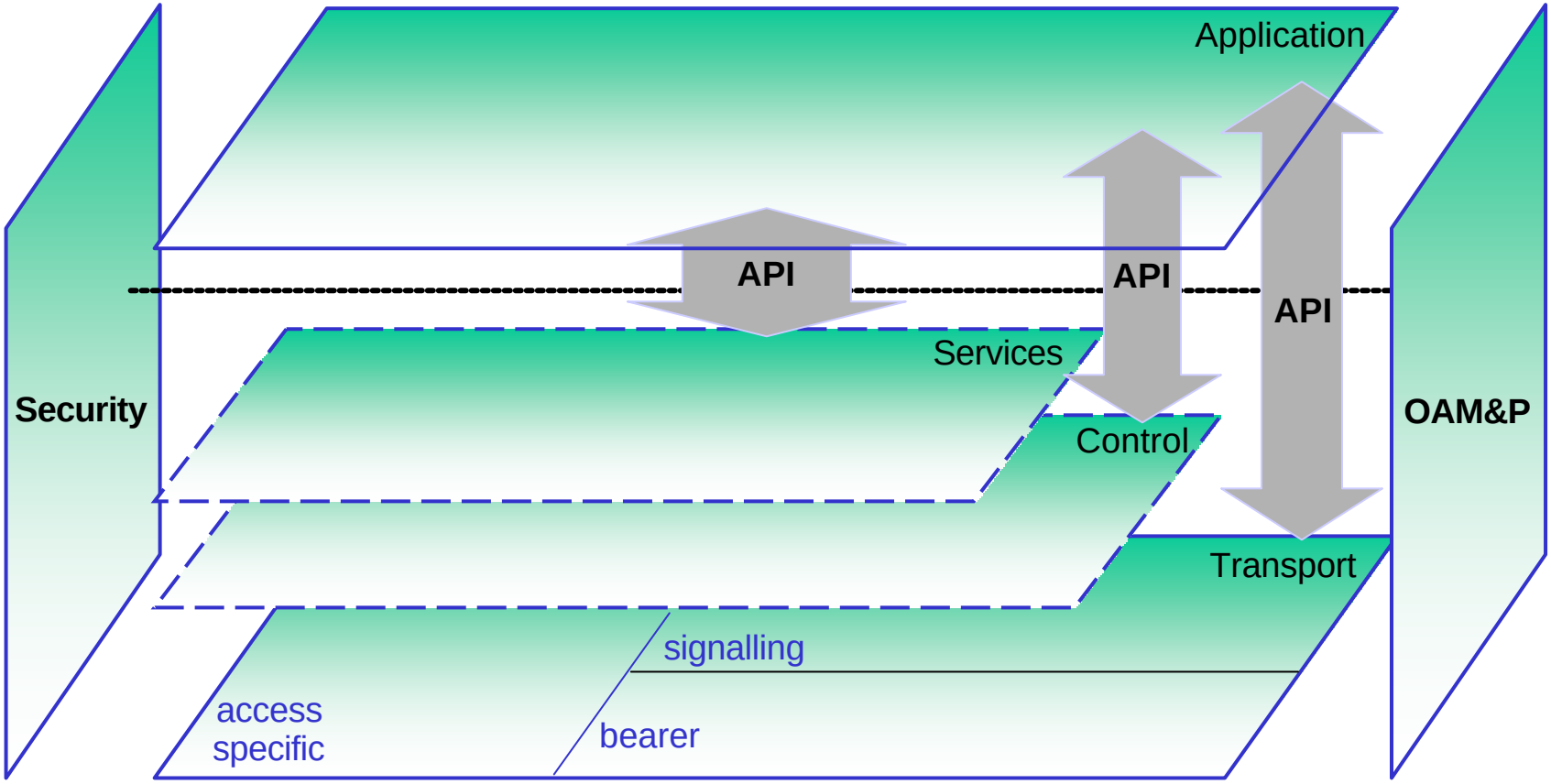
Anything over IP

IP facilitates usage of applications across network boundaries (write once - use many times)

IP over anything

A common IP layer harmonises networks and provides internetworking over different network technologies

Layered Functional Architecture



Separation of services/applications, control, and transport layers

Generic Telecom Network reqmts

- 99.999% network up time
- Regulatory reqmts. are different:
  1. Correct use of spectrum (no interference)
  2. "Receive before transmit" (no harm)
  3. No unauthorised use (stolen terminals)
  4. "Open network" interconnection points
  5. Virtual (mobile) operators (network sharing)
  6. Emergency Communications (fire, police, …)
  7. "Exact" location identity + ("wire tapping")
- Legacy Networks still for 10+ years
- Smooth transition from legacy to "evolution"

ISIM Characteristics

- ISIM "card" is used for subscriber authentication when modifying VLR/HLR information, access to services, first network access, etc.
- ISIM contains, as a minimum, the following:
  - ➔ International Mobile Subscriber Identity
  - ➔ Cryptographic authentication algorithm
  - ➔ Secret subscriber authentication key
  - ➔ temporary network data (carrier frequencies, Forbidden PLMNs, access control classes, etc.)
  - ➔ Service related data (Language, Advice of Charge, etc.)

(Note: Physical smart card is called UICC)
(HW provides more security than SW)

Why ISIM ?

- Separate equipment manufacturing domain from operation domain
  (handling of subscriber related info.)
- provide secure access to reduce fraudulent and/or unauthorised use
- provide identification and authentication of subscriber + terminal
- provide roaming between networks (network selection)
- Private user data
  (abbreviated dialling, address book, …)

Why ISIM Application toolkit?

- Service differentiation by service providers not equipment manufacturers
- provide user defined features (dial control, call barring, ring tones, …)
- third party applications (smart card, pre-payment, banking services, …)
- automatic call set-up based on identities
- provide local information about cell identity, call status, …
- etc.

Conclusions

- (Mobile) Telecommunications is different from “Internet” and is regulated
- No “network / server access” problems as reliability reqmts is 99.999% up-time
- Emergency (and location) reqmts very strict esp. after 9/11/2001
- IP+ (with IMS) is a way forward to create “Network agnostic Services” and “Access agnostic Network”

ITU and IETF need to work in partnership