ITU-T Kaleidoscope Conference
Innovations in NGN

STRATEGIC INNOVATIONS THROUGH NGN STANDARDISATION FOR A UBIQUITOUS CONSUMER WIRELESS WORLD

Máirtín O'Droma & Ivan Ganchev
Telecommunications Research Centre
University of Limerick, Ireland

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Outline

- New Wireless Communications Business Model
  - **Consumer-centric** business model (CBM)
- CBM technological foundations
- Strategic NGN standardisation
- Business development opportunities and
- Social impact and benefits
- Conclusions & Questions

Subscriber-centric Business Model, SBM

- Prior **agreements** between Foreign ANP and Home ANP required for **roaming**.

WiFi, etc

Foreign ANP

SBM

TSP

Home ANP

VASP

Subscriber Mobile User
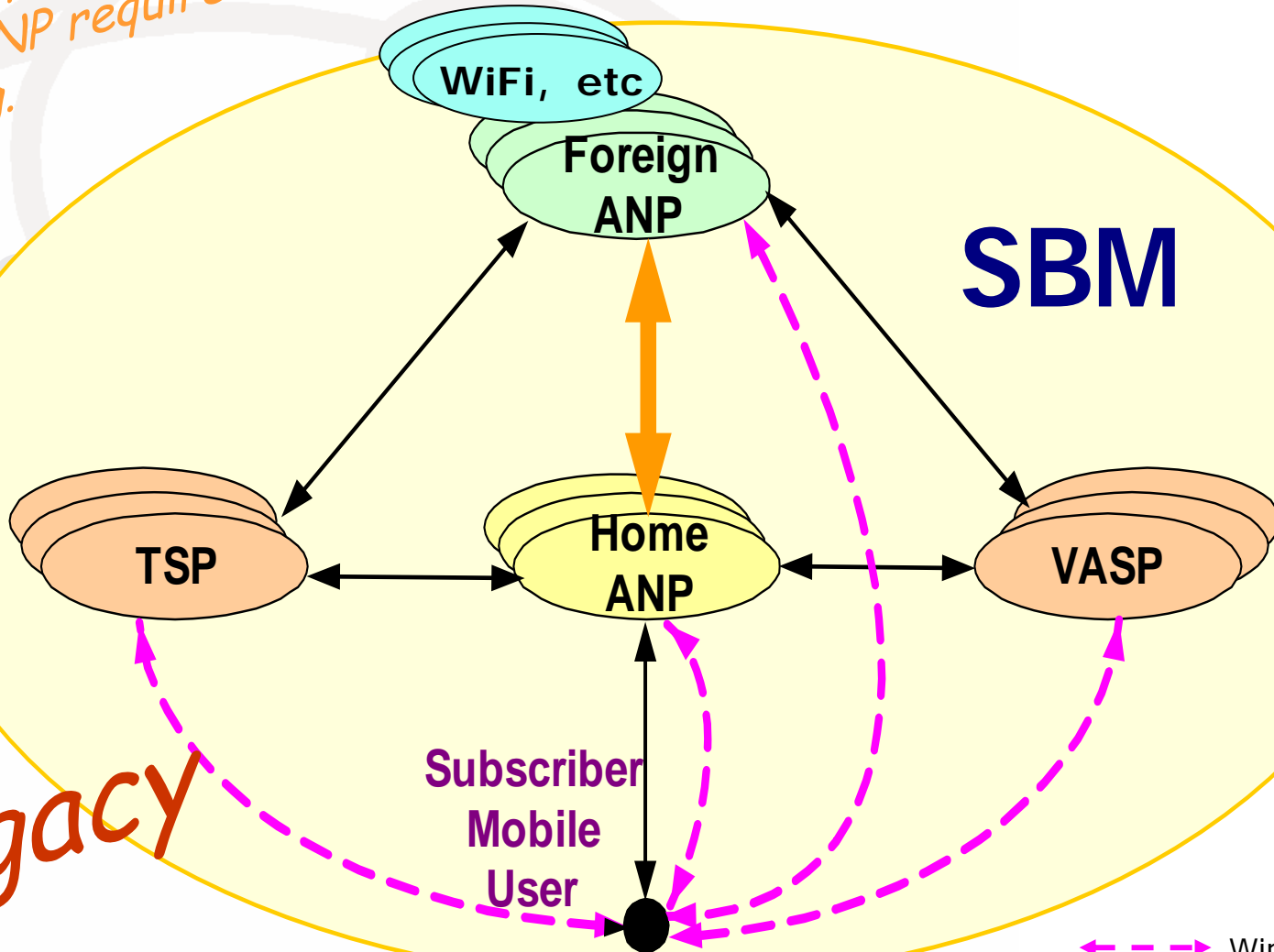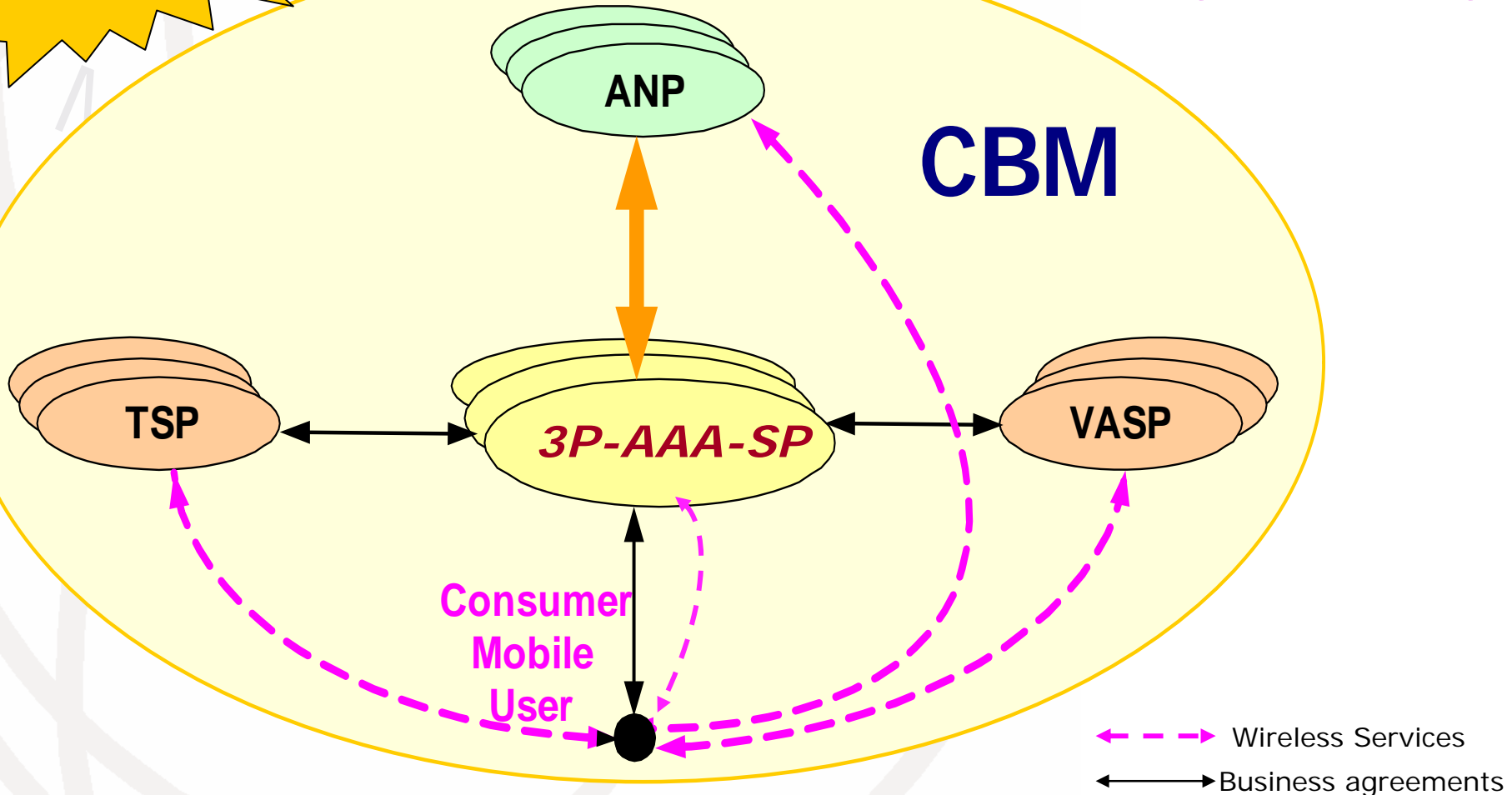
- *Legacy*

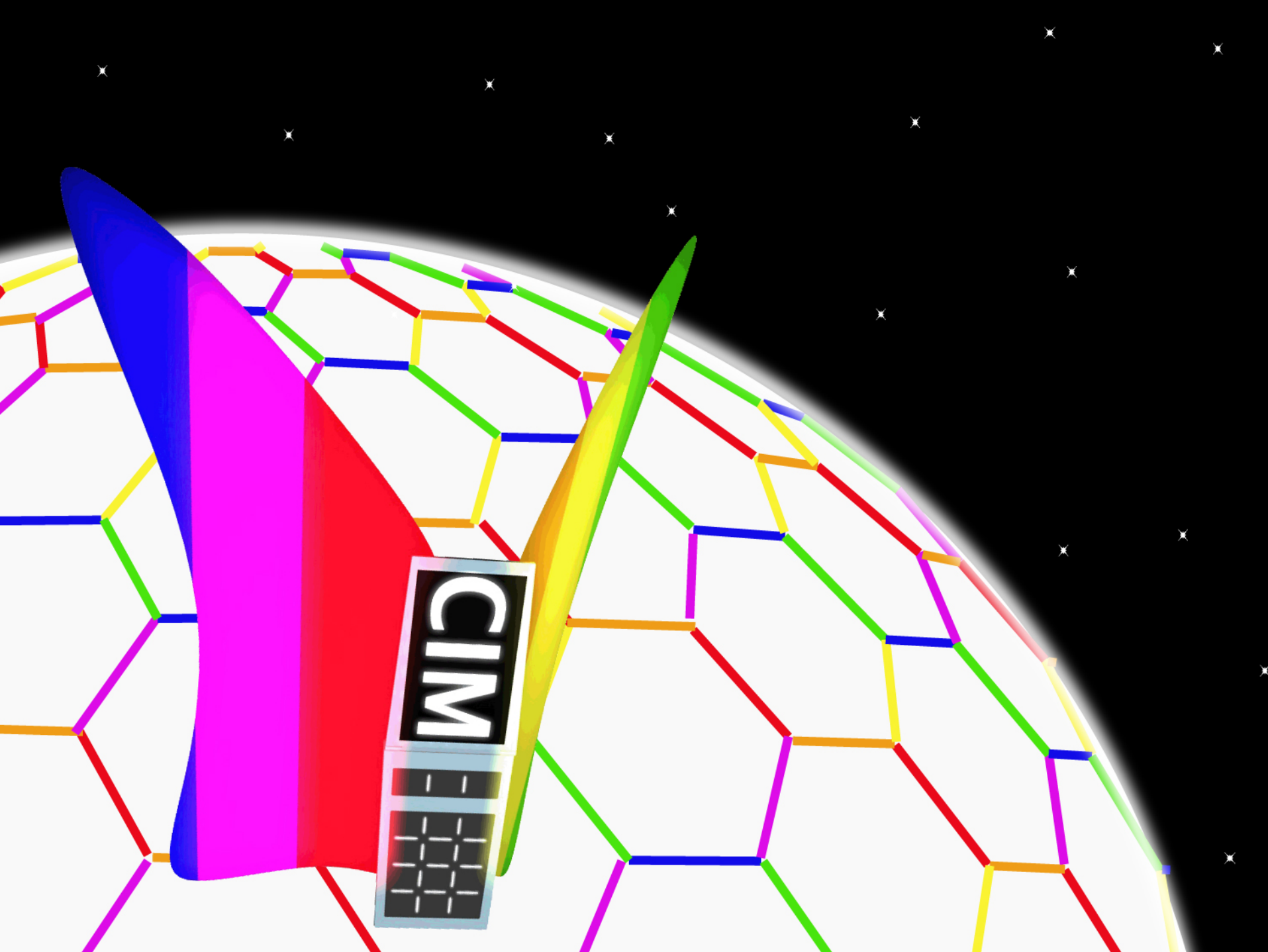Wireless Services

Business agreements

Invisible Constraints ?!

# Consumer-centric Business Model, CBM

- Third-Party Authentication, Authorization and Accounting service providers, **3P-AAA-SPs**

- **Consumer address ownership, portability & security**

New

CBM

ANP

3P-AAA-SP

TSP

VASP

Consumer Mobile User

- - - → Wireless Services
→ Business agreements

NGN authentication architecture for interworking among wireless access networks

3P-AAA Server

ITU Draft Recommendation Q.3202.1: "Authentication Protocols … for Interworking among 3GPP, WiMax, and WLAN in NGN"

For Standardisation
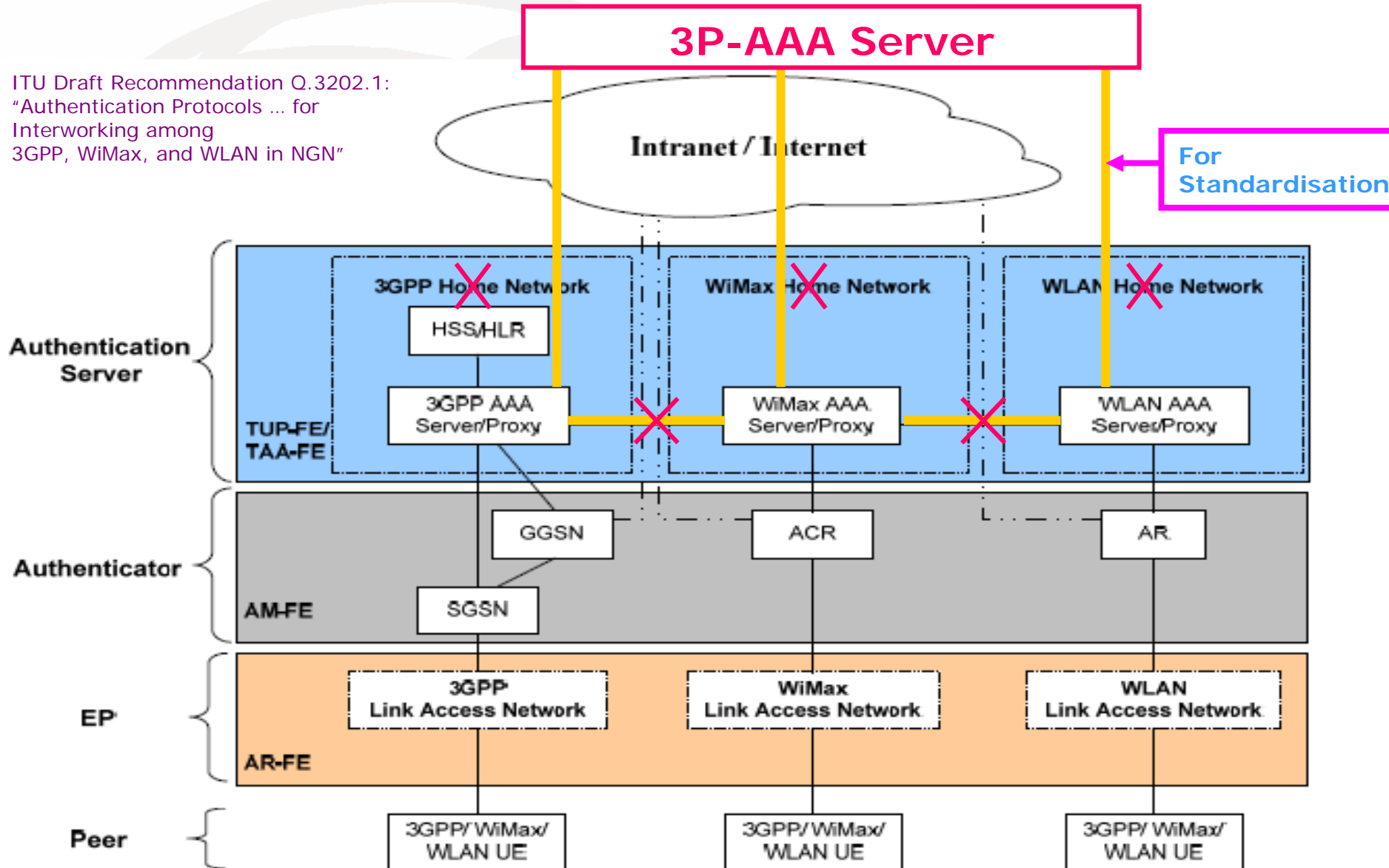
3P-AAA
Service and Service providers

- 3P-AAA SP are new business entities

- Central role

- **Separation of** the administration and management of users' AAA activity **from** the supply of a wireless access network service

  - Many benefits for consumers, new ANP entrants, etc.

- Network-independent, autonomous, and trusted business entities

  - Market fairness and openness

NGN Standardisation: New Interfaces for 3P-AAA functional model
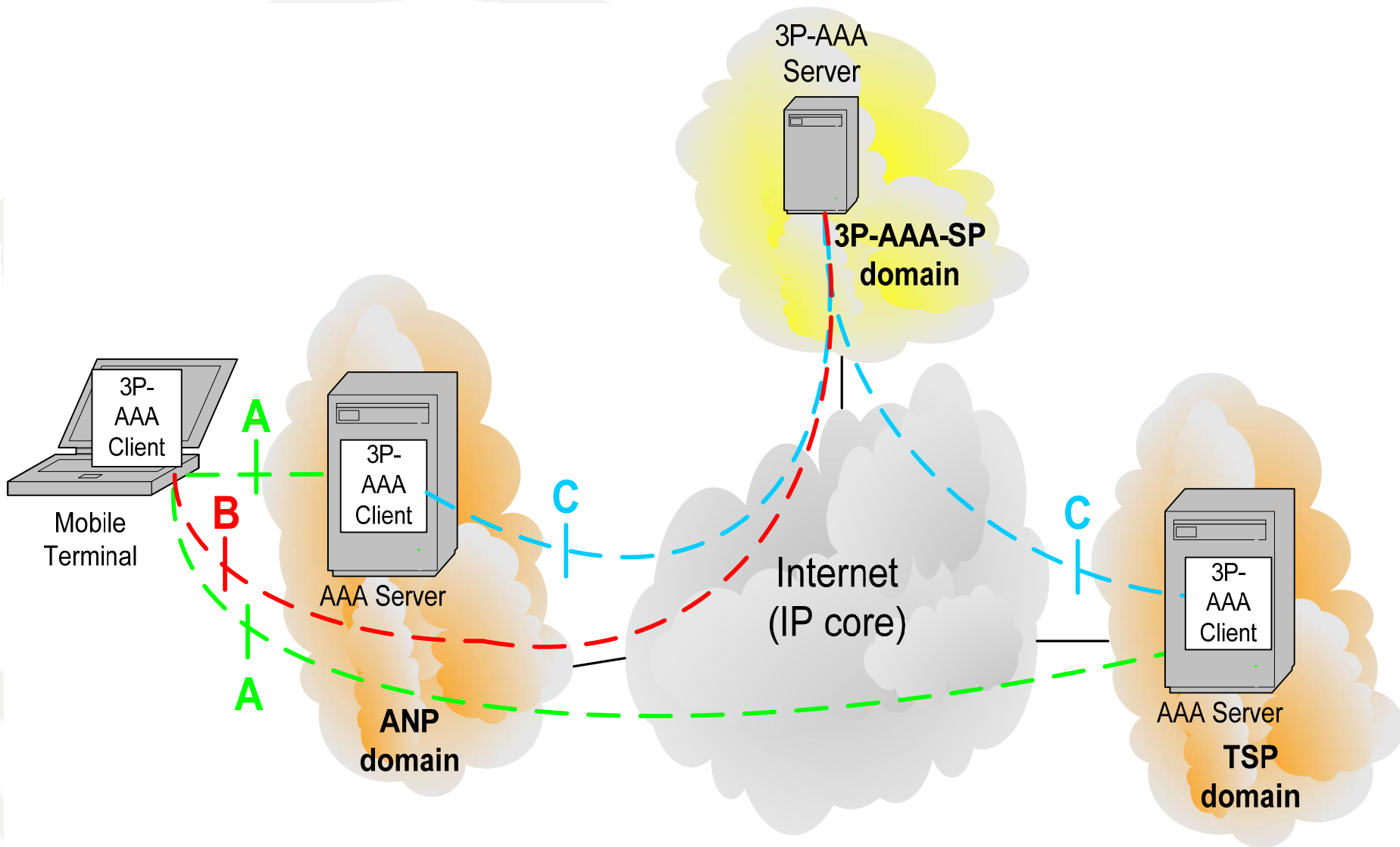
3rd-Party Authentication, Authorisation and Accounting (3P-AAA)

- **NGN Standardisation:**
  - 3P-AAA interface architecture
  - 3P-AAA signalling protocol
- **Business Development Opportunities:**
  - New business entities - 3P-AAA service providers
    - Handling all wireless communication purchasing transactions
  - Expansion into all areas of purchasing through universal CIM cards
  - Wireless payment applications ("mobile money")
- **Social Impact:**
  - Zero roaming charges
  - Users not tied to any ANP

New 'Personal' Address scheme

- **New globally network-independent "personal" Address**
  - **Consumer address ownership and**
  - **Full address portability is enabled**
  - IPv6 addresses
    - separate **class** of **network-independent "personal" IPv6 addresses**
    - >n.10 billion addresses in this class
- **Security**
  - **Universal Consumer Identity Module CIM card**
  - ITU-T X.509 digital **certificate** security
  - **CIM replaces SIM** in UCWW

- **NGN Standardisation - required for these**

CIM Card Security & ITU-T X.509

- IPv6 address
  - purchased by user
  - is embedded into his/her ITU-T X.509 digital certificate
- Location: field
  - 'Extensions'
    - *'Subject Alternative Name'*

Personal IPv6 address(es)

Version
Certificate Serial Number

Signature algorithm identifier
algorithm
parameters

Issuer Name

Period of validity
not before
not after

Subject Name

Subject's public key info
algorithms
parameters
key

Issuer Unique Identifier

Subject Unique Identifier

Extensions *Subject Alternative Name*

Signature
algorithms
parameters
encrypted
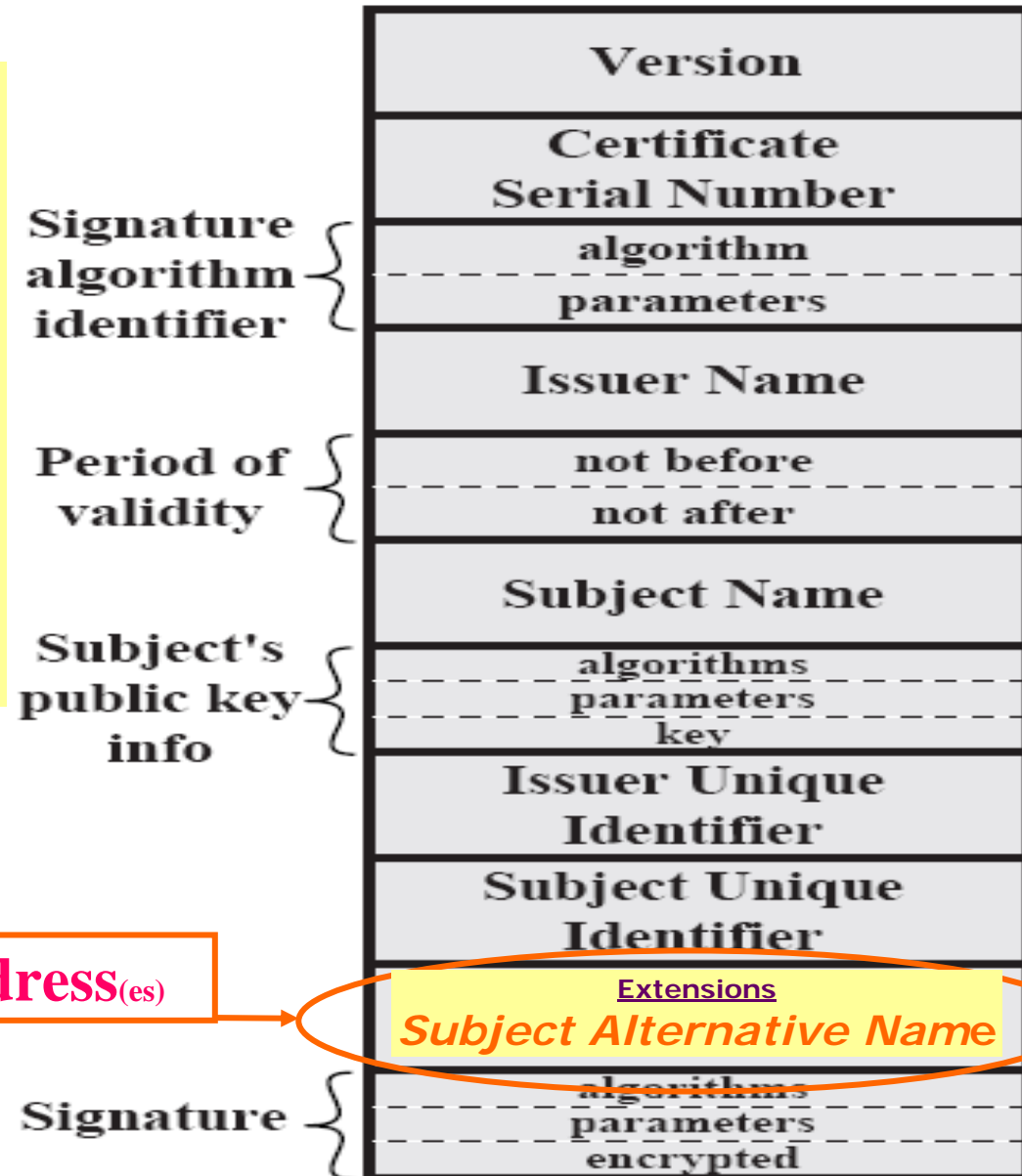
WBC & ICC Services

- Wireless Billboard Channel (WBC)
  - New Service & Service Providers

- Incoming Caller connection (ICC) services
  - New Service & Service Providers

- Both require NGN Standardisation

Wireless Billboard Channels (WBC)

- Wireless equivalent of Roadside advertisement billboards

- 'Push' advertisements means for Access Network Providers
  - 'Presence & current service offerings
  - **Association** procedures for a consumer to obtain services

- Consumer <u>discovery</u> and network association
  - Access network presence & current service offerings
  - Consumers scan WBC broadcasts
    - Discovers, updates, matches service offerings against ABC&S criteria under their different profiles …
    - ABC&S network-service match decisions

- Advertisement, Discovery and Association (**ADA**) functions and activities
  - Particular to consumer wireless communications environment

WBC characteristics

- **Simplex narrowband Broadcast** channels
- Geographic coverage regimes:
  - *Local, Regional, National & Global*
- **Broadcast Platforms (there may be many)**
  - local radio, wireless LAN systems (e.g. WiMax)
  - Digital Audio Broadcasting - DAB
  - Digital Radio Mondiale - DRM
  - Digital Video Broadcast Handheld - DVB-H
  - Satellite Digital Multimedia Broadcasting,
  - S-DMB, or Digital Audio Radio Satellite technology).
- Operated by **non-ANP** service providers
- Standardised Layered architecture

Coverage

Local

Global

Wireless Billboard Channels (WBCs) - Summary

- **NGN Standardisation**
  - WBC spectrum allocations
  - WBC Protocol architecture (physical, data link, and service layer protocols)

- **Business Development Opportunities**
  - New business **s**ervice **p**rovider entities (WBC-SPs)
    - Existing broadcast service providers
    - Advertisers: of **ANP**s, TSPs, and others

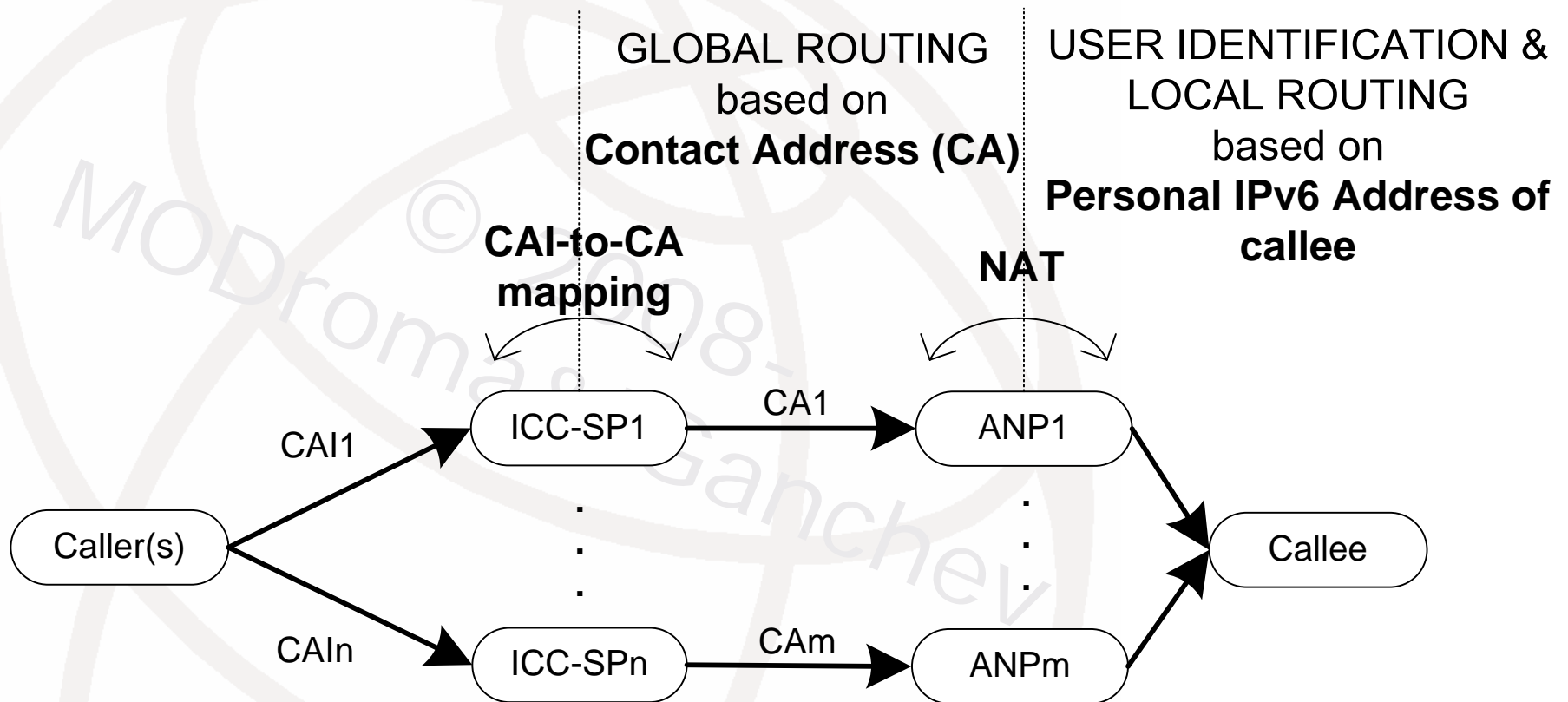- **Social Impact**
  - Users awareness of all current service offerings
  - Competition Stimulus: new services, service costs, etc.
  - Strong support for consumer 'freedom of choice'
    - Choice of 'best' service within a group of services
    - Personal profile matching & user-driven ABC&S decisions
  - Fair and equal pro-actively access to consumers for
    - Existing and NEW access network providers
    - Others - TSPs, mobile handset manufacturers, etc.

Consumer-oriented
Incoming Call Connection service (ICC)

- Not having a fixed point of attachment how can a consumer receive incoming calls?
  - SBM strength
  - To be re-invented
- Creation of a new business entity
  - Incoming Call Connection (ICC) service Provider
    - Outside the access networks - **autonomous**
    - **Lynch-pin** for Incoming Call Connection (ICC) service
  - Operation based on
    - A **'contact address (CA)'** scheme
      - globally routable, temporary, forwarding IP address
    - A **Contact Address Identifier** (**CAI**)

ICC Service Operation

GLOBAL ROUTING based on **Contact Address (CA)**

USER IDENTIFICATION & LOCAL ROUTING based on **Personal IPv6 Address of callee**

CAI-to-CA mapping

NAT

Caller(s)

CAI1 → ICC-SP1 → CA1 → ANP1

CAIn → ICC-SPn → CAm → ANPm

Callee

Incoming Call Connection (ICC) service

- **NGN Standardisation**
  - ICC interface architecture
  - ICC signalling protocol
- **Business Development Opportunities**
  - New entities - ICC service providers
  - Provision of user-friendly, flexible, specialised and customised ICC management services for
    - individuals, groups and corporations
- **Social Impact**
  - Full freedom of consumer choice, e.g.
    - Which networks to use for these services at any location or time
    - Matching ANP to be used to incoming caller profiles.
  - Consumer communications management
    - Enhanced, new possibilities, customisation, dynamic & adaptive, e.g.
      - incoming call connection service to be dynamically matched to consumer roles and profiles.

CBM technological foundations

- 3rd-Party Authentication, Authorisation and Accounting **3P-AAA**

- New Personal-IPv6 address & CIM card

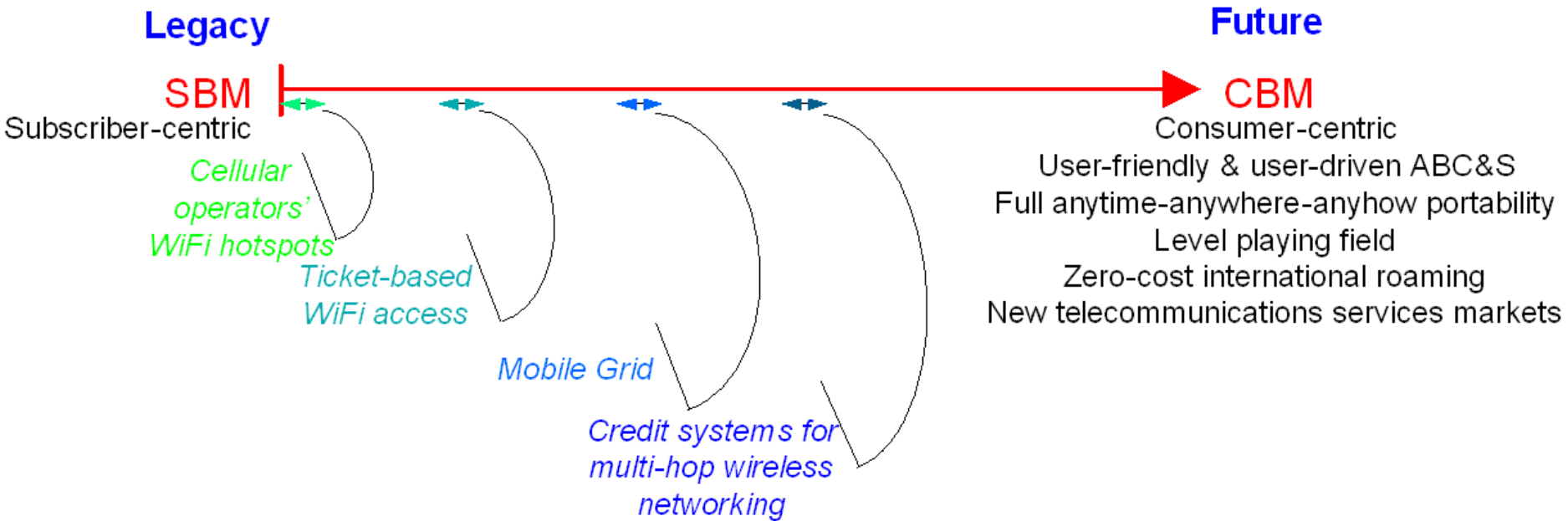**The two Pillars**

- Wireless Billboard Channels **WBC**

Business Pillar

- Consumer-oriented Incoming Call Connection service **ICC**

Re-invented

Trend from SBM to CBM

Legacy | Future

SBM — CBM

Subscriber-centric → Consumer-centric

Cellular operators' WiFi hotspots

Ticket-based WiFi access

Mobile Grid

Credit systems for multi-hop wireless networking

Consumer-centric
User-friendly & user-driven ABC&S
Full anytime-anywhere-anyhow portability
Level playing field
Zero-cost international roaming
New telecommunications services markets

UCWW in Harmony with ITU NGN objectives
(1/3)

- **Packet-based network**
  - Primarily IPv6
    - New 'personal IPv6 address' class proposed
- **Broadband capabilities with end-to-end QoS and transparency**
  - UCWW includes an end-to-end transparent user-controlled Hot Access network Change (HAC)
  - Supports transparent asymmetric connections
- **Unfettered access for users**
  - Users not tied to any particular ANP
- **Generalized mobility**
  - End-to-end controlled and executed, e.g. for HAC
  - Primarily user-driven (and also supported by service providers)
  - Full number portability

UCWW in Harmony with ITU NGN objectives

- **Interworking with legacy networks via open interfaces**
  - Three new open 3P-AAA interfaces are proposed
  - Transparent heterogeneous interworking facilitated
    - all network types, PSTN, wireless, etc.

- **Unified service characteristics for the same service as perceived by the user**
  - Services categorisation
    - based on the NGN Service Classification, ITU-T Focus Group on NGN (NGNFG) WG1
  - Supported by the new Wireless Billboard Channels
  - Compliance with all regulatory requirements (e.g. emergency, privacy etc.)

- **Decoupling of service provision from network, and provision of open interfaces**
  - Defining characteristic of UCWW
    - 3P-AAA SPs; WBC SPs; ICC SPs;
  - Clearer separation between ANPs and TSPs

UCWW in Harmony with ITU NGN objectives
(3/3)

- **A variety of identification schemes which can be resolved to IP addresses for the purposes of routing in IP networks**
  - New Contact Address Identifier, CAI, scheme
    - in the Incoming Call Connection service, ICC
  - Works in conjunction with the permanent Personal IPv6 address
    - New IPv6 class proposed

- **Converged services between fixed/mobile**
  - New ICC service would support legacy ICC service
    - E.g. fixed PSTNs

- **Ubiquitous Consumer Wireless World environment** proposed

- **Main beneficiaries**
  - **Consumers**
    - Huge increase in the freedom of choice in obtaining & managing wireless services
    - Greatly increased mobility
    - Full number portability
    - Consumer-driven Always Best Connected & Served (ABC&S)
  - **All Wireless Business Stakeholders**
    - Manufacturers, Service providers, Application Developers, ANPs, ...
    - New Wireless business entrepreneurs

Benefits include

- **More open wireless communications market**
  - 'level playing field' for new network-provider entrants
- **Immensely increased technological and business opportunities**
  - for wireless access-network-providers
  - Mobile phone manufacturers
  - others
- **Removal of roaming charges**
- **Stimulation of**
  - many new telecommunication services
  - new wireless communications businesses
    - 3P-AAA SPs; WBC SPs; ICC SPs: **+ + +**
  - new niche and specialised wireless-access-network opportunities
  - ingredients for a potential commercial solution for **Ad Hoc** networking.

Strategic Innovations
Through NGN Standardisation

Twenty years from now which is it to be?

End

Thank you

Questions, comments & discussion welcome.

Presentation by

Dr. Máirtín O'Droma

Email: mairtin.odroma@ul.ie