



Development of IPX: Myth or Reality?

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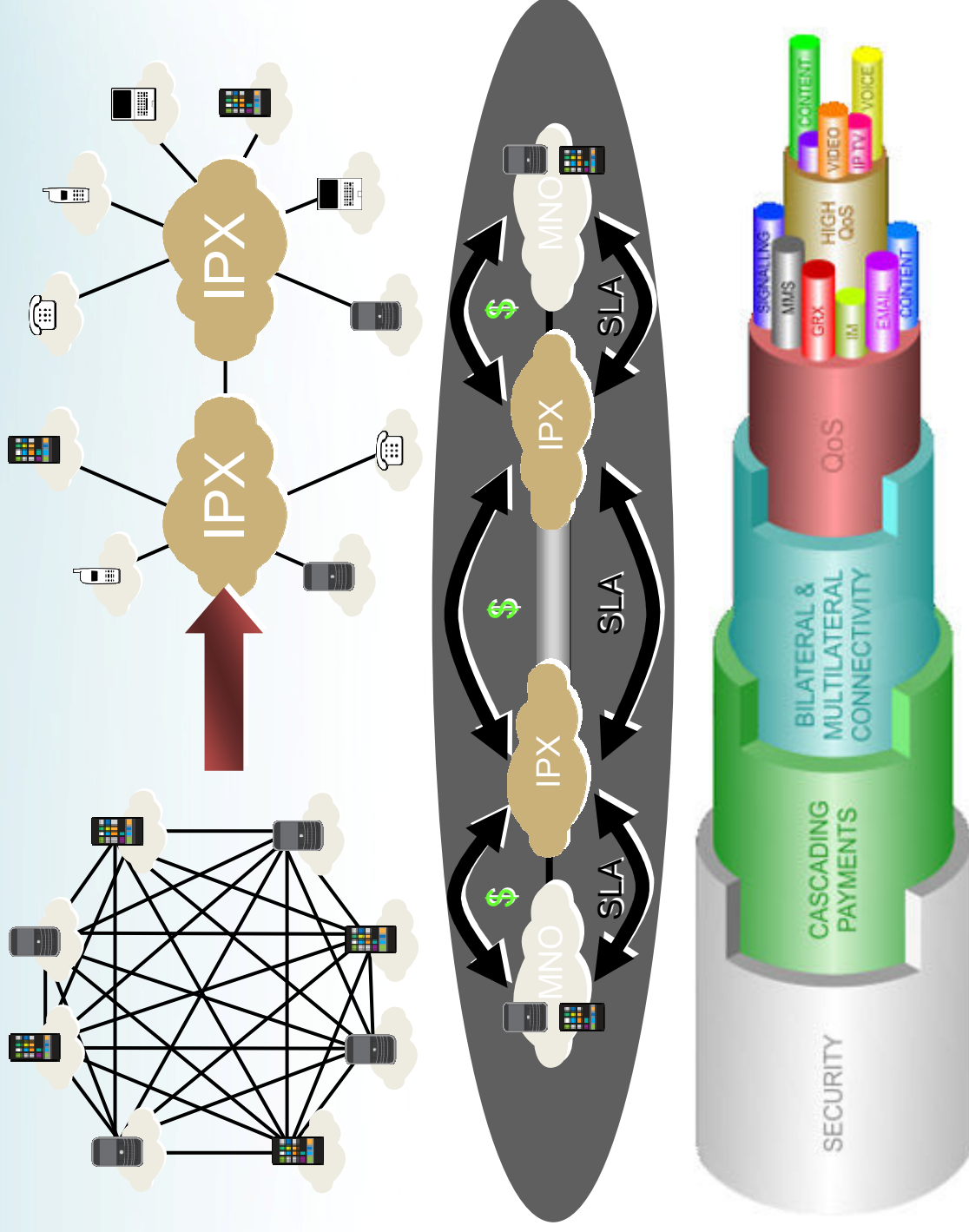
Agenda

- IPX – Acme Packet Perspective
- IPX and LTE/VoLTE



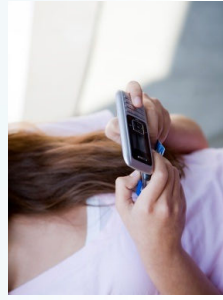
IPX – A Vendor Perspective

The IPX Vision



Unified service evolves

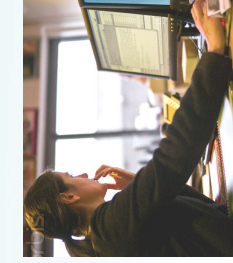
- any device, any one, any time



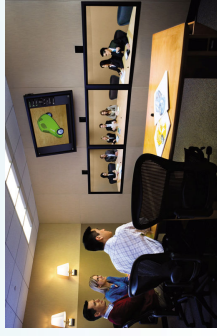
Text



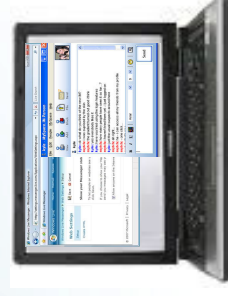
Voice



Data



Video

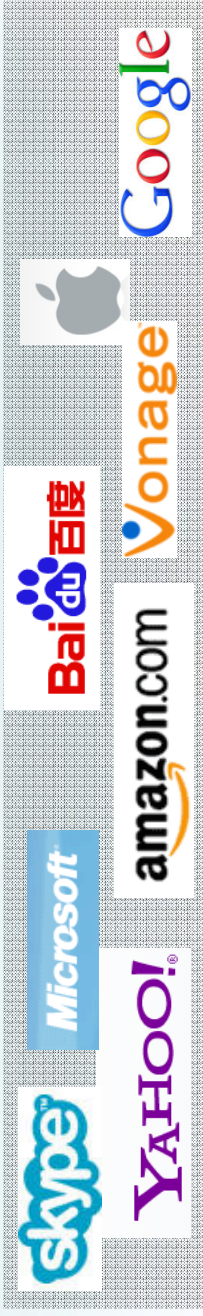


Presence + IM

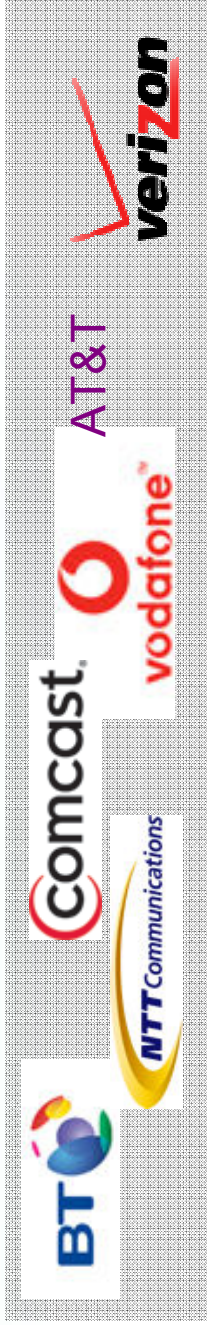


“Service provider” choices will increase

Over the top



Service provider



Enterprise



Cloud services will dominate

* Most services are already in service provider clouds

- Mobile
- Residential
- IP Centrex
- SIP trunking
- Over-the-top

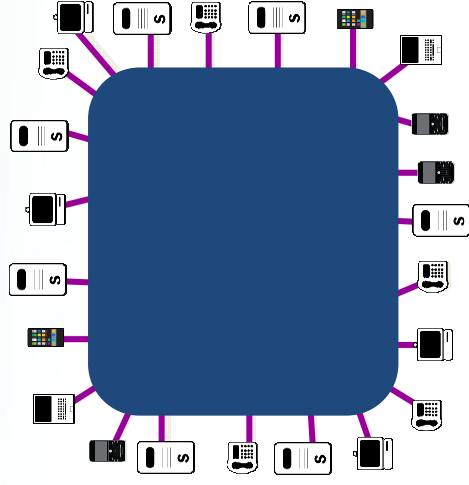


IP PBX and UC servers will vanish from enterprise premise, except the largest, communications - critical enterprises will build their own cloud

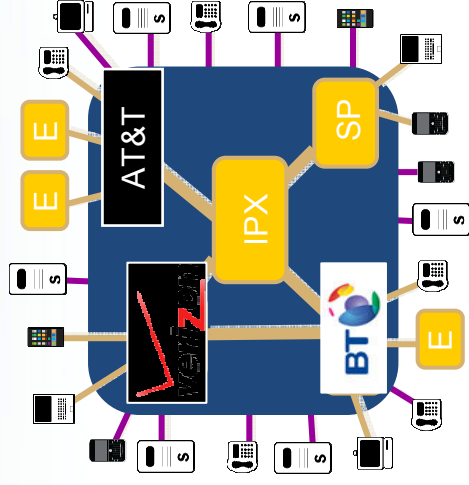
Right network plumbing will be critical - bandwidth & QoS, identify, privacy

Network transport choices increase

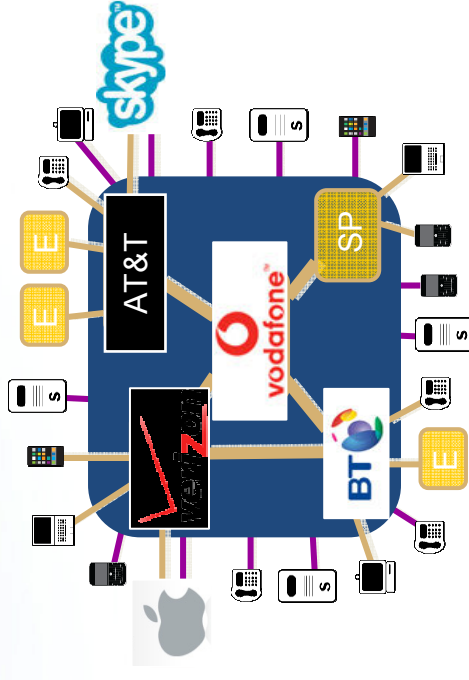
Internet



IPX (Federnet)



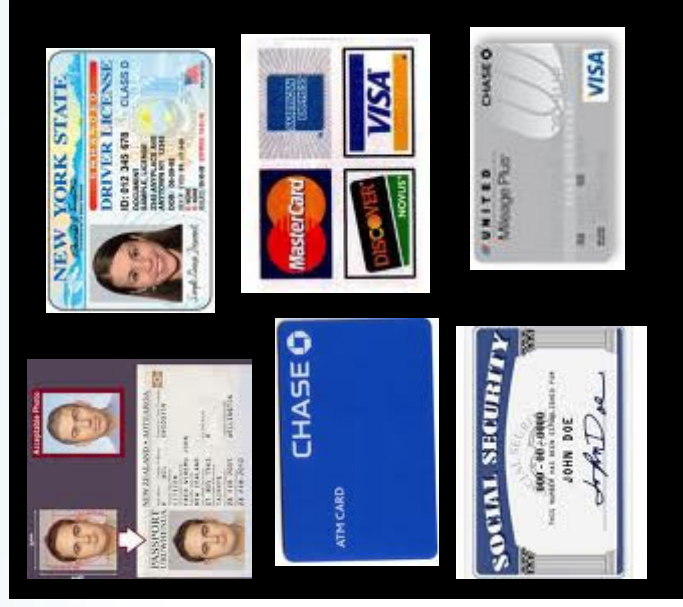
Future (Federnet 2.0)



Mobile access will dominate



“IP” – identity and privacy become critical



A future of increasing choices

- Unified service evolves – any where, any one, any time
- “Service provider” choices will increase
- Cloud services will dominate
- Network transport choices will increase
- Mobile access will dominate
- “IP” – identity and privacy – become critical

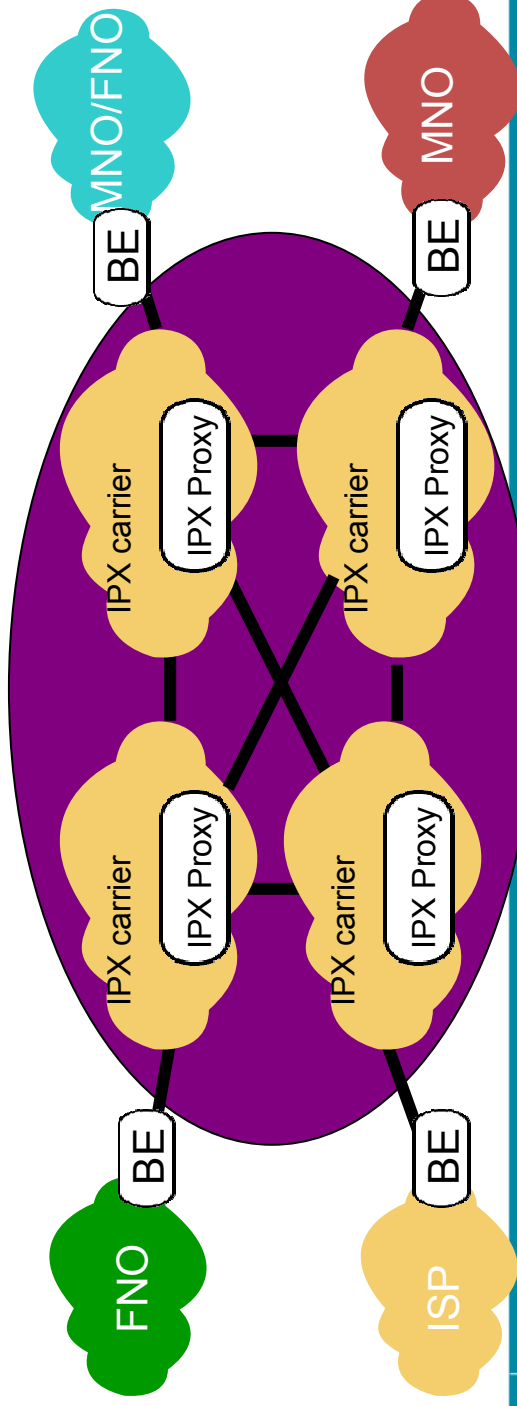
More choices requires more mediation and control at borders

1. In IP, we trust no one
2. Addresses and identities will forever be heterogeneous
3. Competitive Service Offerings may involve other protocols besides SIP
4. Codecs will never converge to a couple - audio & video
5. Unlimited bandwidth, QoS & signaling resources will forever be a myth
6. Some sessions are more important/valuable
7. No one will be allowed to do anything they want
8. IP regulatory compliance requirements will increase
9. Service provider business models will never be homogenous

IPX – A New Transport Choice

IPX Network Architecture

- IPX network architecture is a private IP backbone network with service-aware elements (IPX Proxy)
 - Not-accessible by the Internet
 - IP backbone network is the current GRX
- IPX Proxies are key to support multilateral/hub connectivity in a scalable and efficient manner
- At the border between the service provider there will be a border element (SBC, soft-MSC, or SS/MG)



Why support IPX

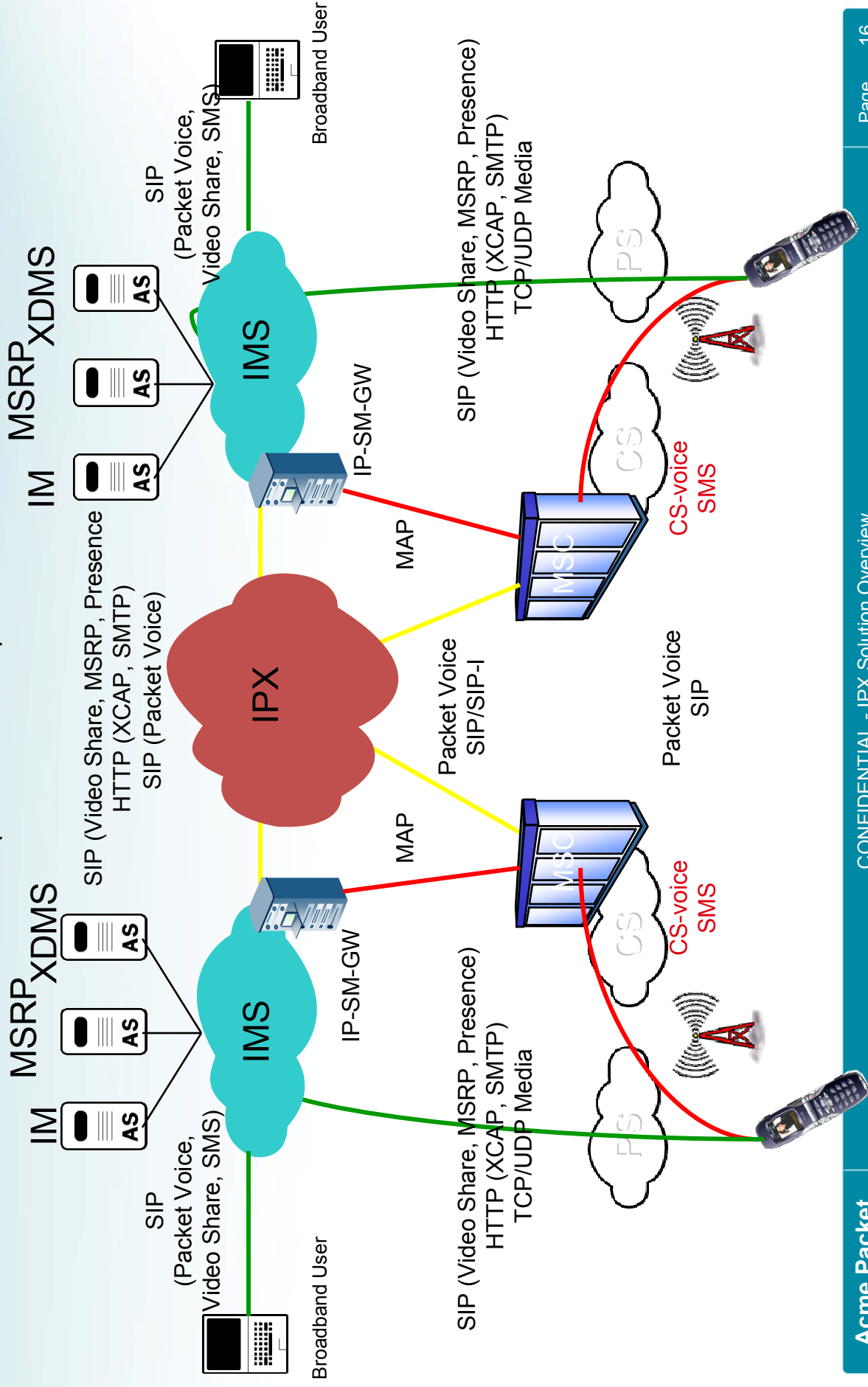
- Avoid becoming a dumb pipe with low value and low margins
- Unlike public Internet, IPX provides interconnection and transit services with assured security and controlled QoS
- Compelling value proposition:
 - Simplified operations
 - Common charging principle
 - SLAs
 - Multiple connectivity models
- IPX carrier can provide additional services beyond transit
 - Transcoding
 - Protocol interworking
 - ENUM & number resolution

Why should and MNO/FNO use an IPX carrier?

- Assure end-to-end delivery of VoIP and interactive IP communications
 - Packet voice (SIP, SIP-I)
 - RCS Services
 - Instant messaging and presence
 - Video sharing
 - Image sharing
- Service Hub mode: simplified operations
 - Cascade billing
 - Contract with few IPX carriers instead of 100s of Service Providers (MNO/FNO)
 - Long distance and interconnection with small players
- IPX services are standardized
 - Common charging principle
 - Technically inter-operable end to end
- Agreements specified in a Contract Service Schedule containing
 - SLAs
 - Connectivity model
 - Operator interconnection list

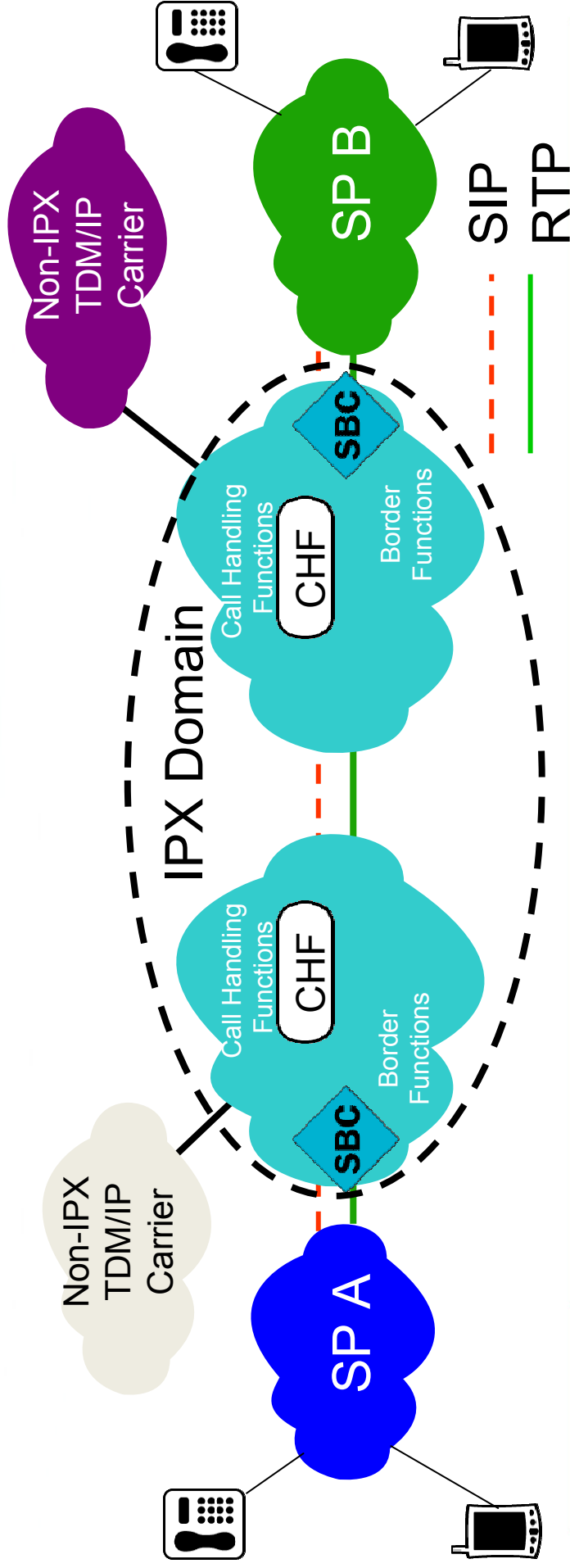
Going beyond voice: RCS and IPX

(animated slide)



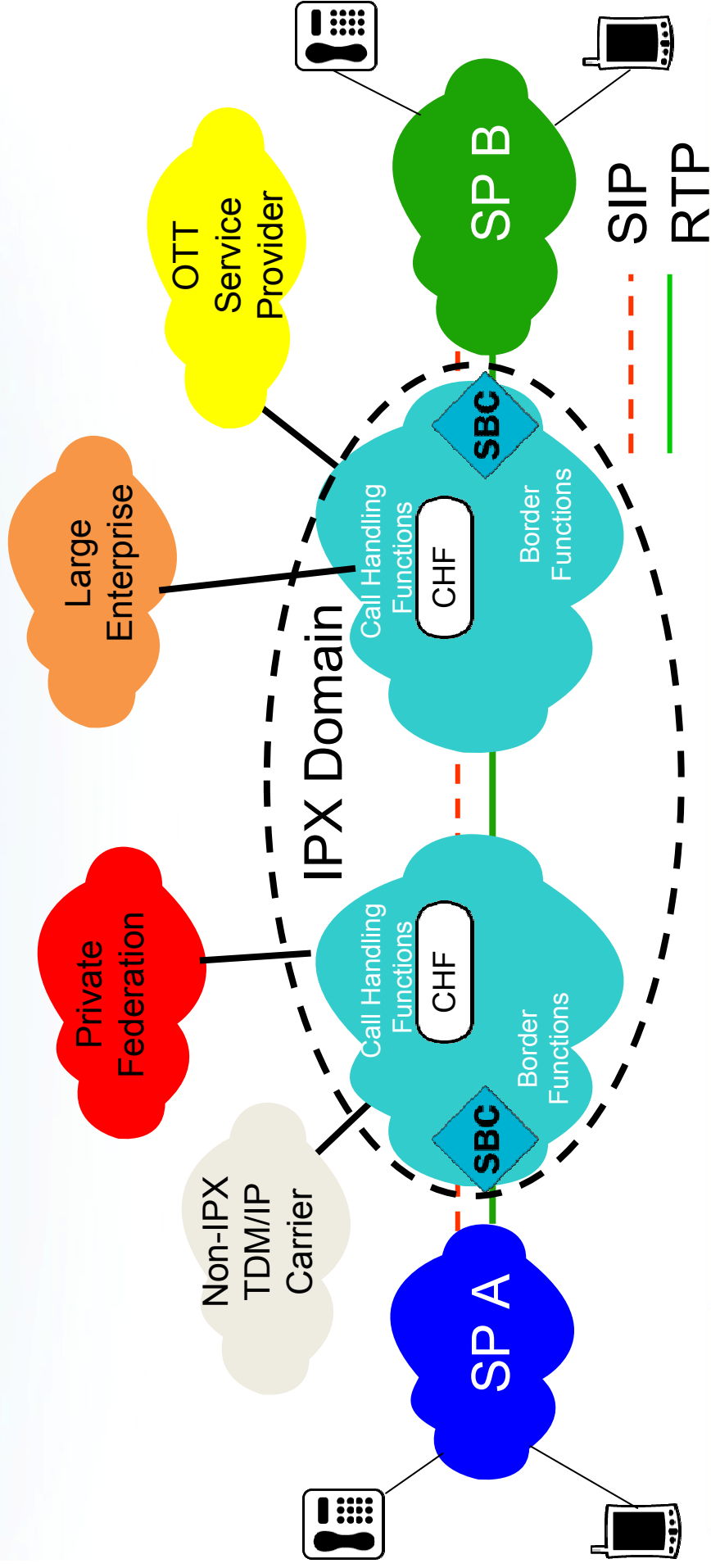
i3 Forum's vision of IPX model

- The i3 Forum Carriers endorse the basic IPX concepts around having a reliable, trusted, secure and quality controlled international (voice) service
- Also the commercial requirements are endorsed
- More pragmatic and realistic approach in certain topics
 - Security to be provided by Border Functions (SBCs)
 - Quality-of-Service control
 - Break-in/break-out



Future of IPX model

- Direct connectivity to Large Enterprises and Private Federations
- Direct connectivity to OTT Service Providers
- Evolution of IPX to Service Delivery Network (SDN)
- Large emphasis on Video and OTT Services

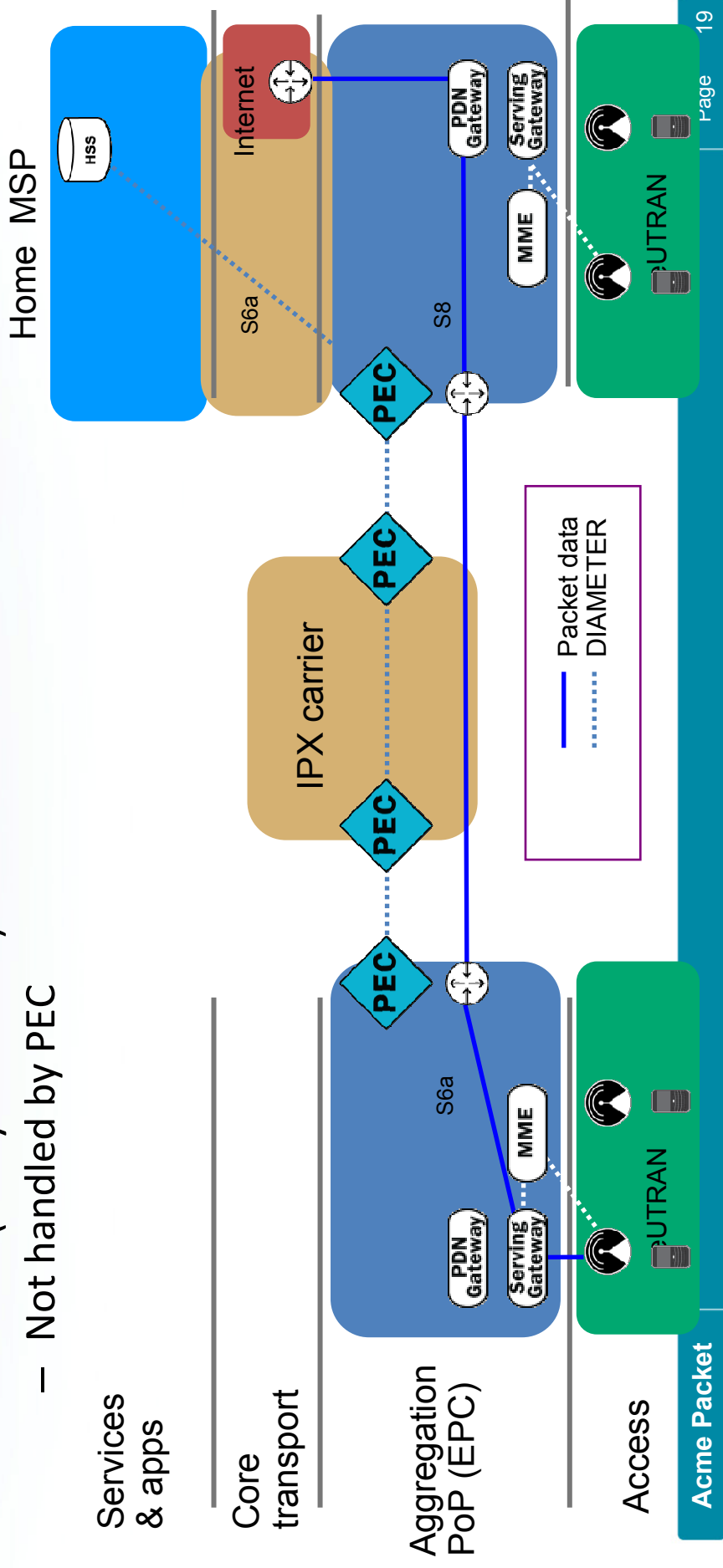


LTE data roaming



=Diameter Policy Exchange Controller

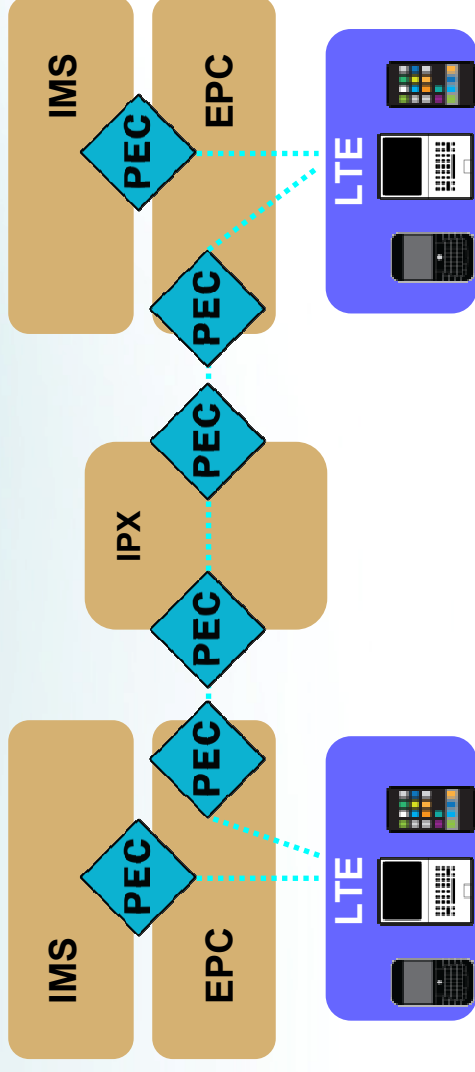
- All data is “home routed” – i.e. sent to the home network
- S6a Diameter interface – control plane for user information
- S8 interface – user plane for data
 - GTP (Generic Tunneling Protocol) or
 - PMIP (Proxy Mobile IP)
 - Not handled by PEC



Net-Net

Policy Exchange Controller

- **Policy** – authorization, location, charging and service profile information using Diameter signaling
- **Exchange** – policy information sent between network elements or across network boundaries
- **Control** – security, interoperability, routing & aggregation of Diameter signaling messages

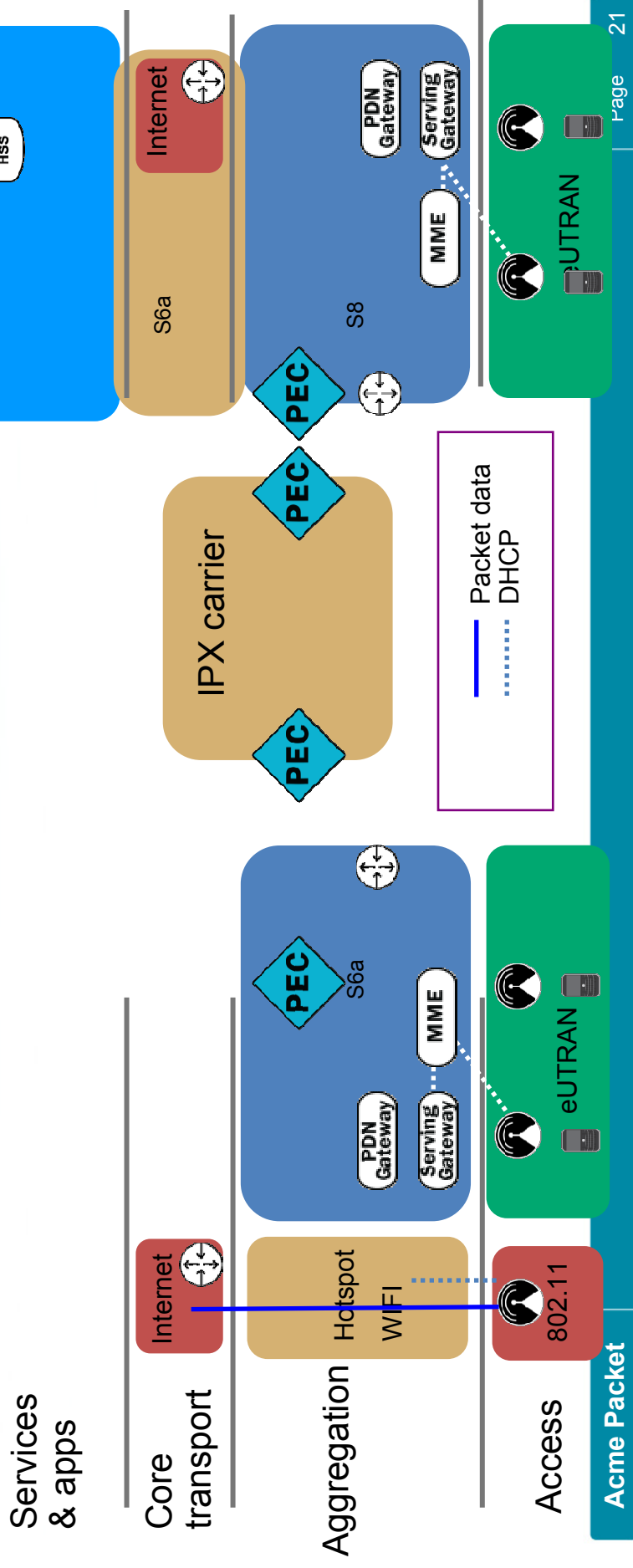


Standards compliant

- RFC 3588 Diameter agent (relay or proxy)
- 3GPP Diameter Routing Agent (DRA)
- GSMA Diameter Edge Agent (DEA)

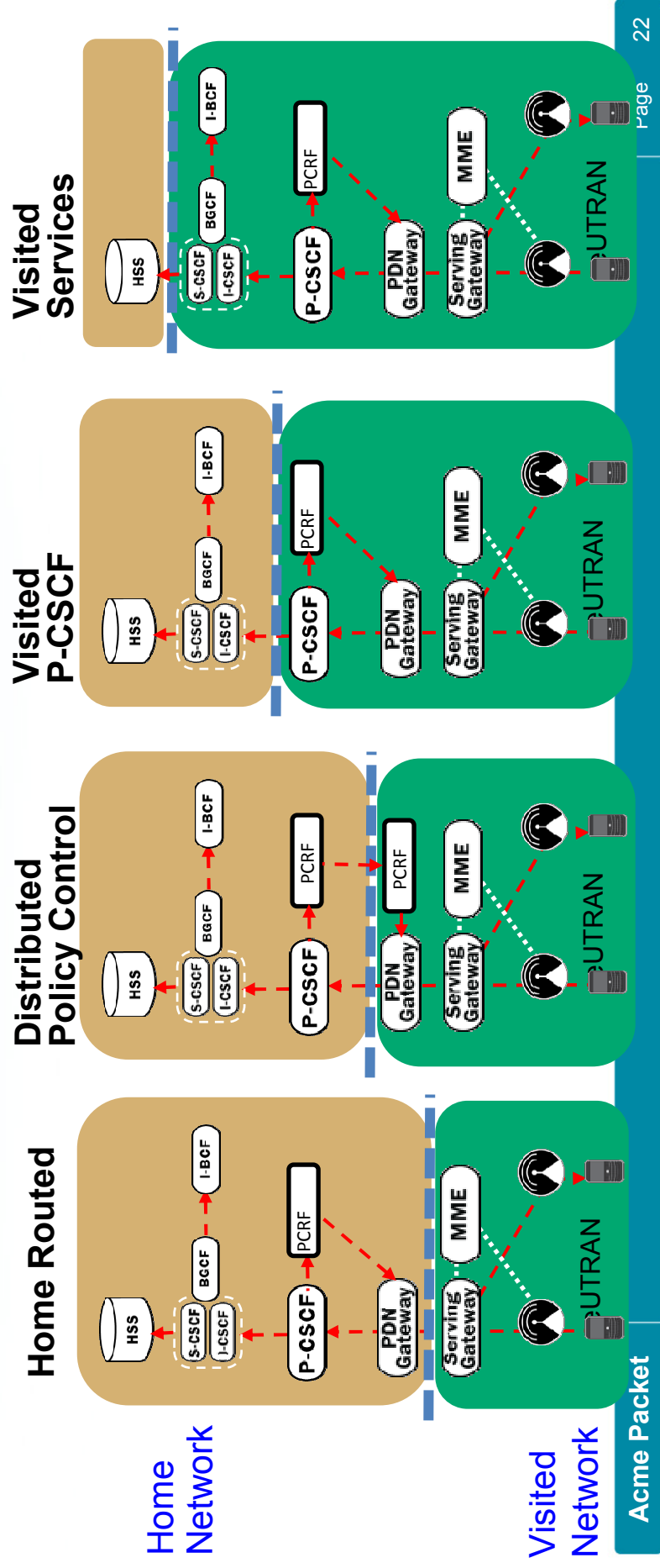
But in Reality – 802.11 offload may be preferred

- 802.11 WIFI/Hotspots
- Home/Business/Commercial/Municipal Networks
- DHCP Universal
- Orthogonal Billing/Privacy/Security Schemes
- Very High Capacity

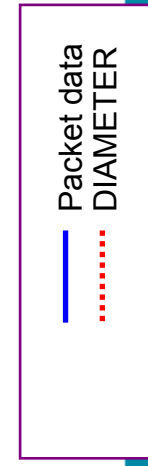


Roaming for Services in IMS

- There are various approaches to roaming in IMS
 - Home routed with data backhaul to home network (existing data model)
 - Distributed policy control with policy interfaces
 - Visited P-CSCF with policy control in visited network
 - Visited services with IMS core in visited network
- One Voice / IR.92 selected Visited P-CSCF model
 - Provides strong balance of visited control and home visibility/services

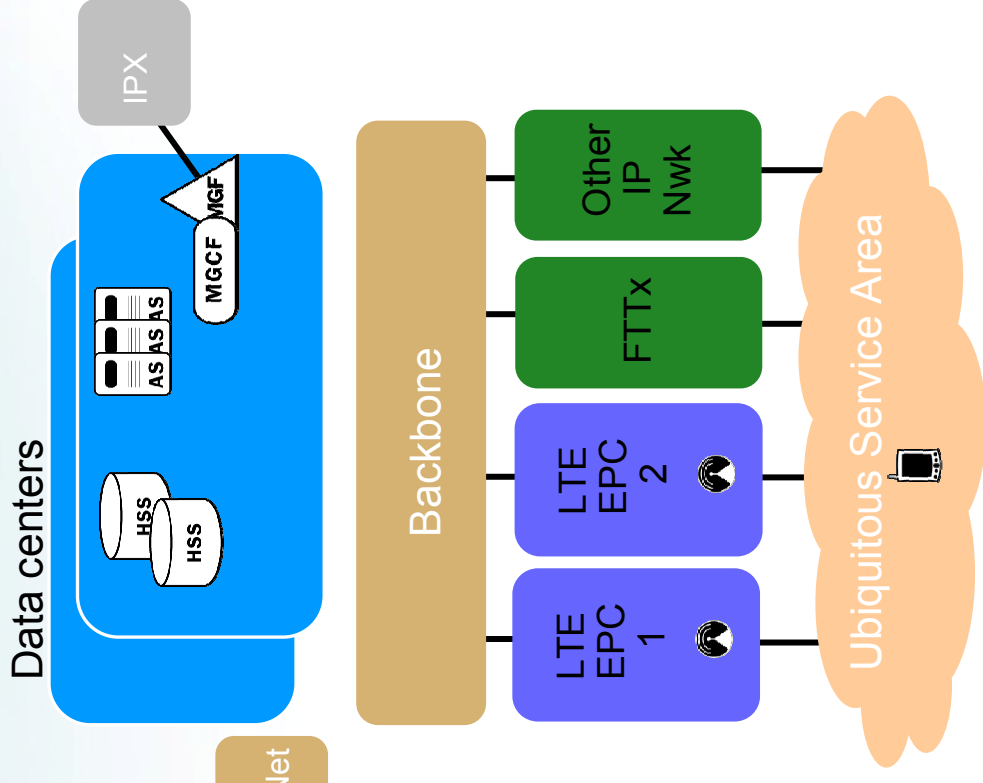


- Delivered over the top of other IP Access Networks to ensure uniform delivery
- Universal Interop at the SIP layer not possible in near future



Data Center Approach to IMS

- Deploy Data Centers
 - Create a Service Delivery Network
 - Has Public Addresses
 - Universally reachable
- All applications must work everywhere
 - Must work across all access networks
- Single-Sign On Required
 - Phone & Service must easily move between:
 - Different LTE providers
 - Different IP Access Networks (802.11 reachable)
 - Avoid Re-authentication
 - Retains service context with no loss of service
 - Support 3G Roaming (ATCF)
- EPC Role Redefined
 - Only an Access Network
 - No Service Infrastructure
 - No Service participation
 - Roaming is for Data Only



VoLTE Conclusions for i3Forum

- Current Roaming models are impractical, and not likely to survive long term
 - Backhaul of bandwidth too expensive
 - SIP UA Universal Interoperability not likely soon
 - Service Differentiation by carriers not possible
- IPX Opportunities in LTE
 - Access/Authentication/Identity/Trust during roaming
 - Charging during roaming
 - Connections to existing 3G
 - Connections between LTE Providers
 - PSTN Terminations
 - Connections to Enterprises
 - Connections to Federations