



Deploying Media Probes in Evolving VoIP Networks

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Agenda

- ♣ Convergence of Fixed and Mobile services are driving networks towards IMS based architectures in order to offer ubiquitous services.
- ♣ This session looks at:
 - ♣ How networks are evolving to deliver new services.
 - ♣ The requirements placed on the networks to deliver LI
 - ♣ A brief overview of a typical VoIP LI architecture
 - ♣ Pulling it all together

Next Generation Networks - Observations

- ♣ Tier 2s lead the way with tactical IMS deployments
- ♣ Tier 1s generally playing catch up
- ♣ Most VoIP plays are opportunistic/tactical today
- ♣ NGN is more than VoIP
- ♣ Consumer, Business and Enterprise focus
- ♣ Many different forms of NGN
 - ♣ PSTN replacement – 21CN
 - ♣ New service overlay – PoC
 - ♣ Multimedia – Video services
 - ♣ Fixed Mobile Convergence
 - ♣ IPTV
- ♣ All of this means network evolution and IMS

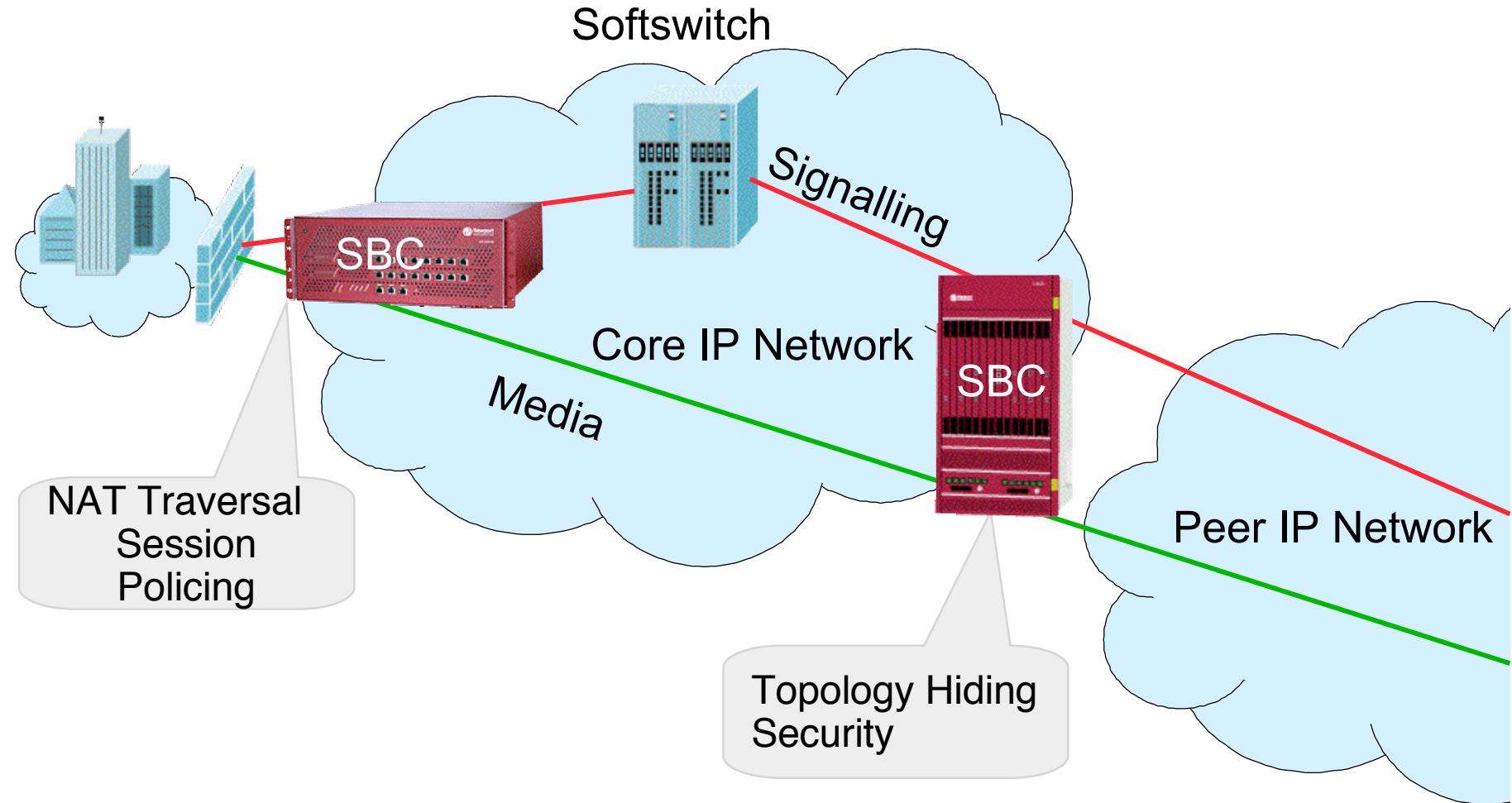
Why IMS?

- ♣ PSTN -> IMS is a logical migration step to provide new services
- ♣ PSTNs which have *already* migrated to NGNs may look at reducing further CAPEX by migrating to an IMS-like core
- ♣ IMS provides the glue between services and networks
- ♣ It aims to deliver any service to any device over any network
- ♣ Designed to allow rapid prototyping and deployment of services
- ♣ Mobile Service Providers:
 - ♣ IMS was created to fulfil need for 'feature rich' services
 - ♣ Converged service to business and residential
- ♣ Wireline Service Providers:
 - ♣ Long term PSTN replacement programs
 - ♣ Must innovate to regenerate Wireline revenues
 - ♣ Add value to existing services
 - ♣ Move into new markets via convergence
 - ♣ Reduce Opex

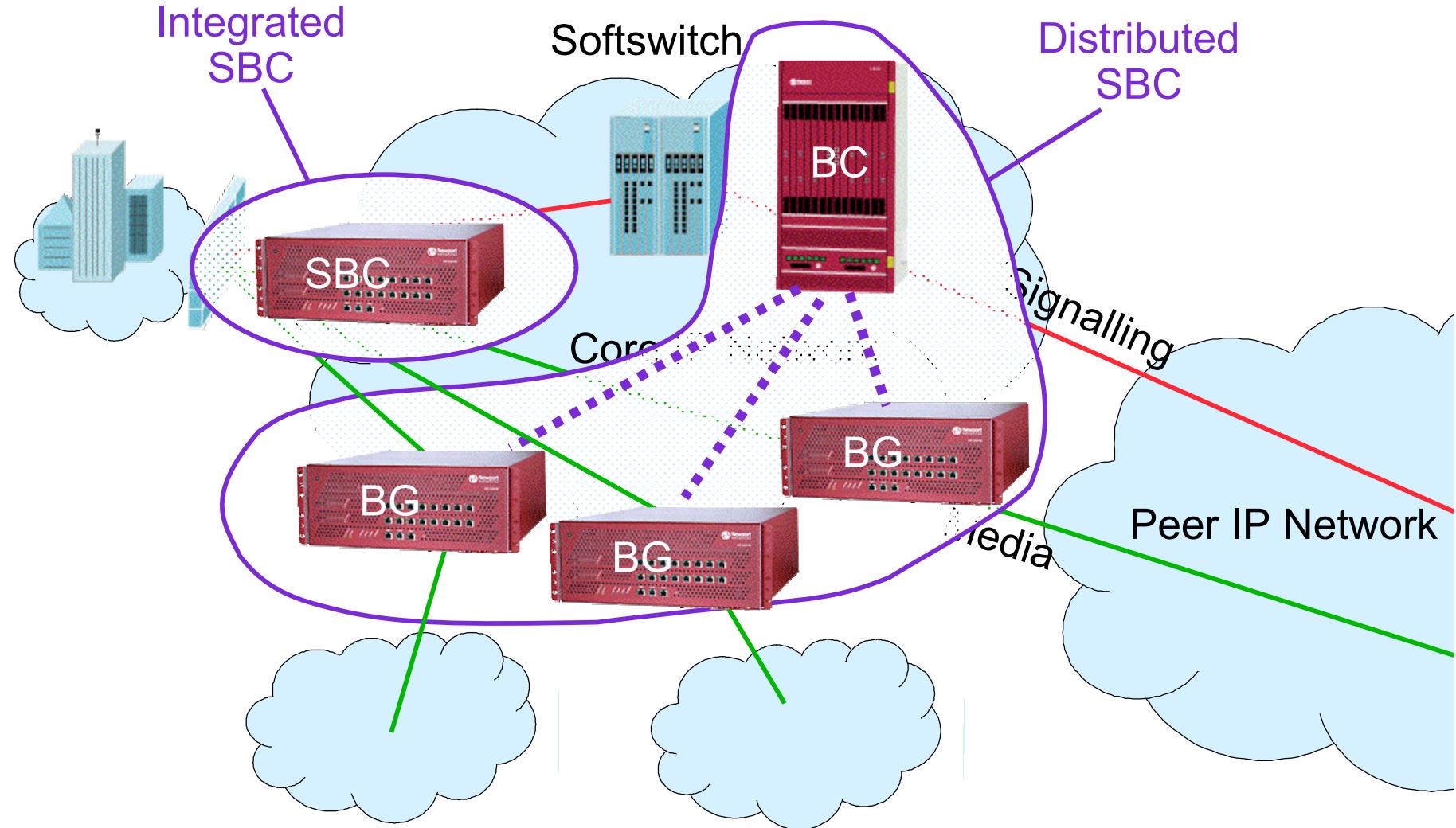
The Evolution Path

- ♣ Today VoIP is driving deployments
- ♣ Often overlaid onto current IP data networks
- ♣ All I need is a Softswitch?
- ♣ Need to overcome some issues to achieve this
 - ♣ Connectivity
 - ♣ Quality
 - ♣ Security
 - ♣ Resilience

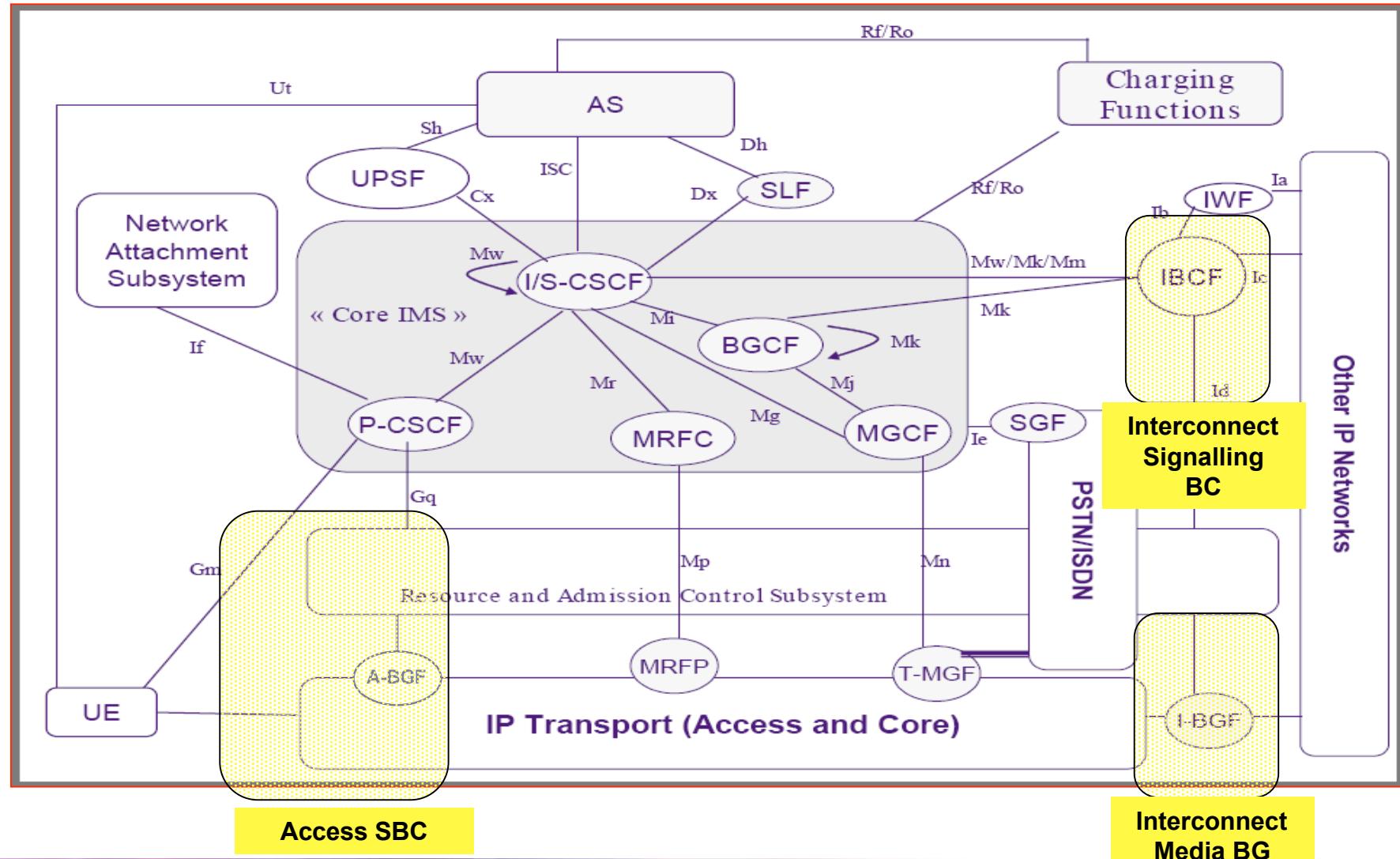
How have networks evolved?



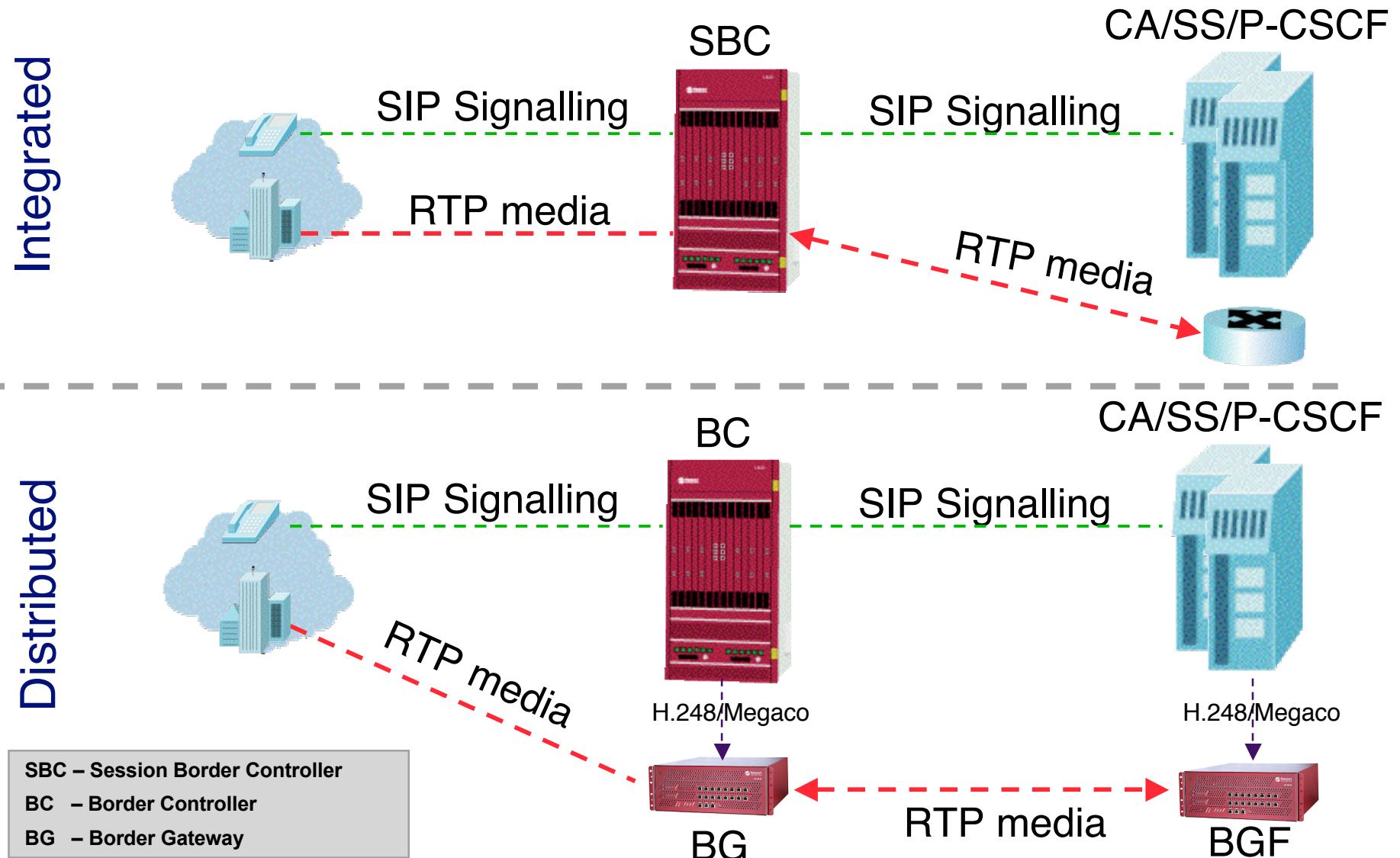
How have SBCs evolved?



TISPAN Architecture

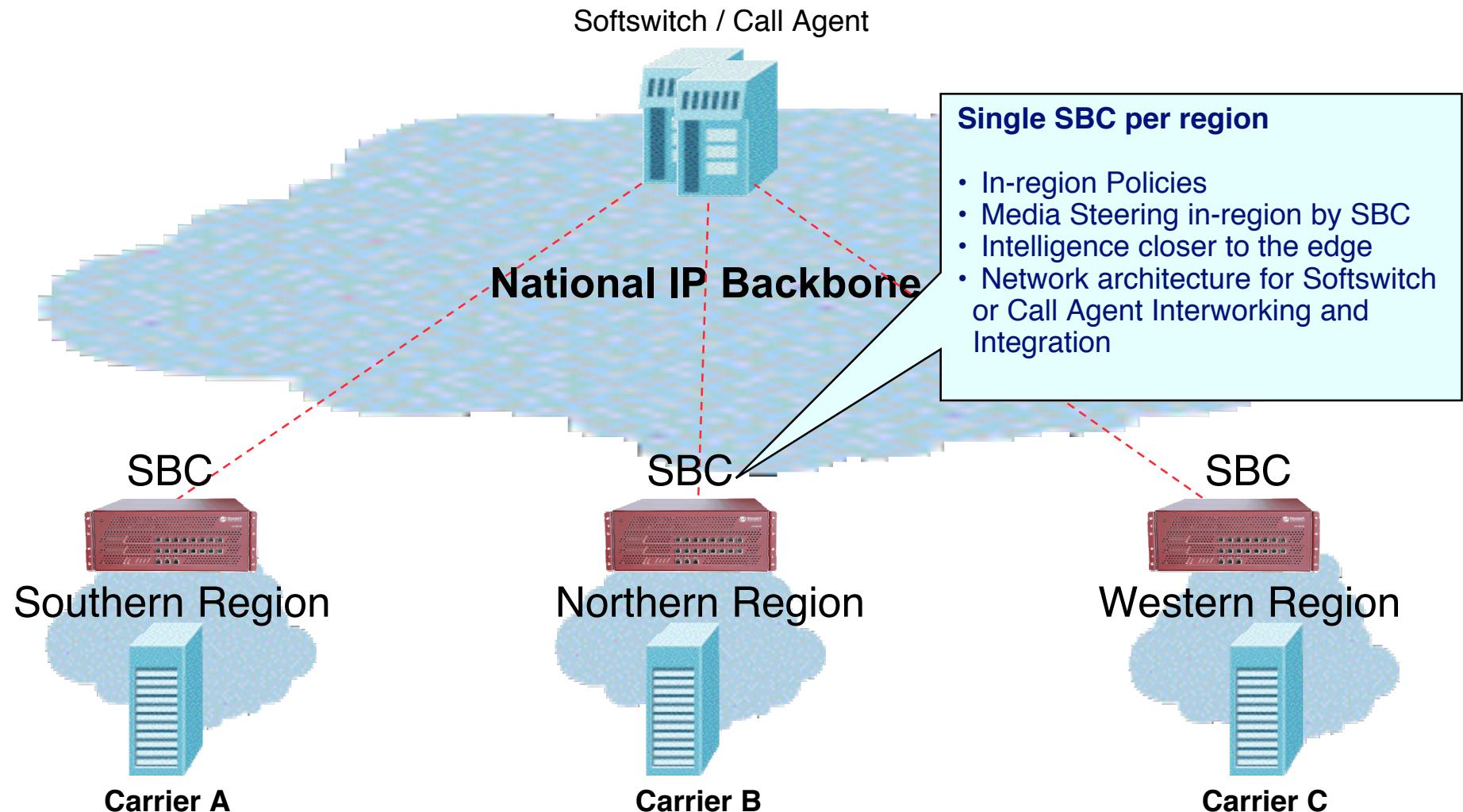


Integrated and Distributed SBC Architectures



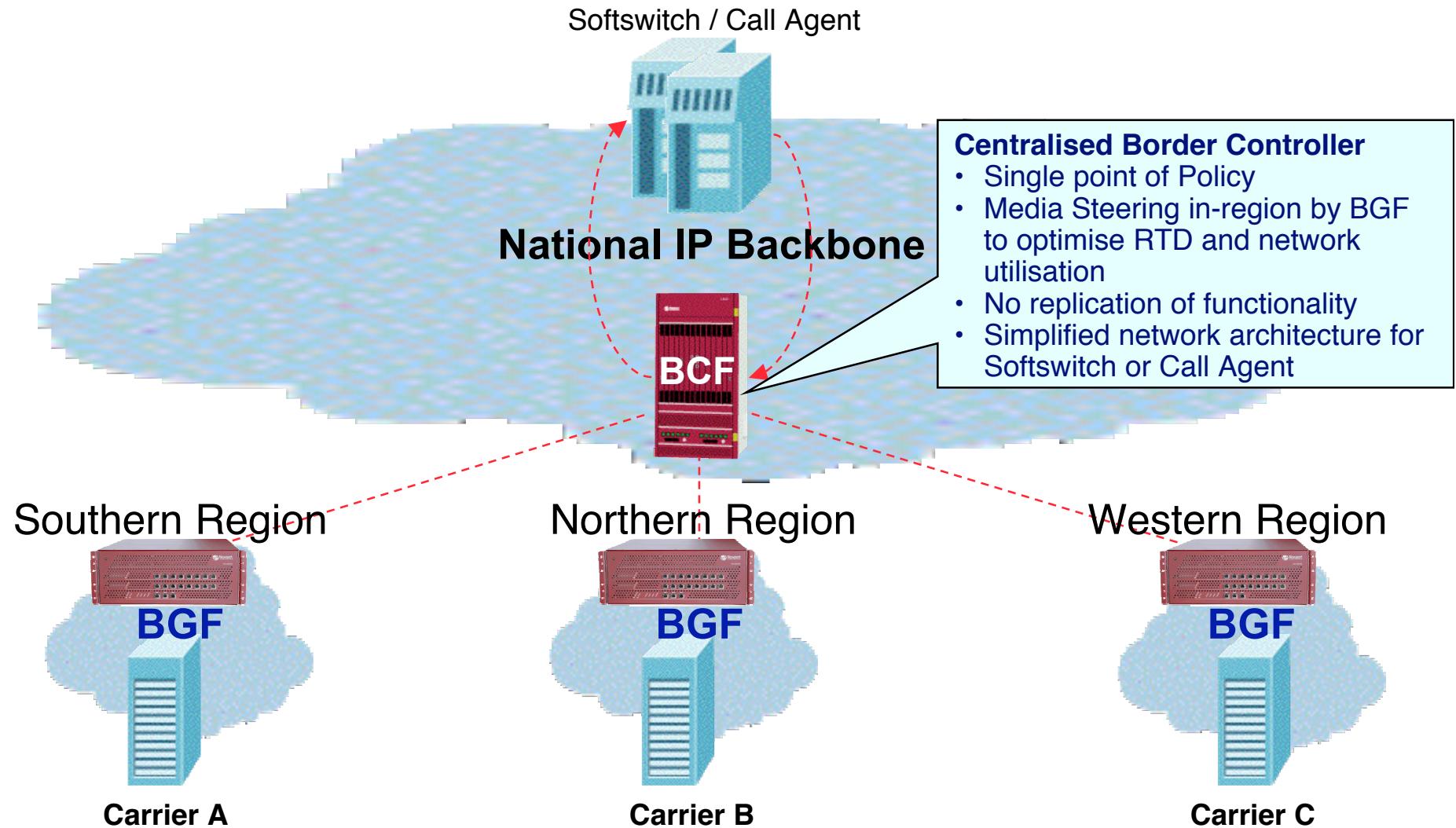
VoIP Peering – The Traditional Interconnect Model

Regionalised SBC for signalling and media



VoIP Peering – The distributed Interconnect model

With centralised SBC for Signalling and distributed Media

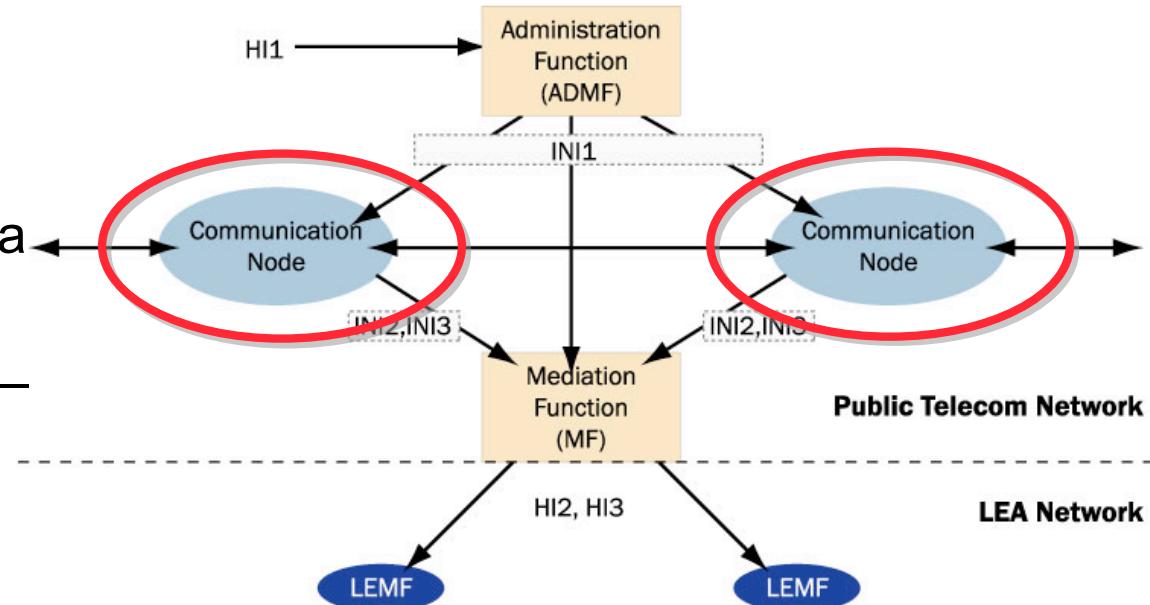


Summary of LI landscape

- ♣ Separate legal frameworks for most countries
- ♣ Technical standards mostly relate to interfaces – with much common ground
- ♣ But most have some common requirements
 - ♣ Legally sanctioned official access to private communications
 - ♣ Can only be enabled with a legal warrant
 - ♣ Required functionality in modern telecoms equipment
 - ♣ Must provide transparent interception of specified traffic only
 - ♣ Targeted user must not be aware of interception
 - ♣ Other users must not be affected during interception

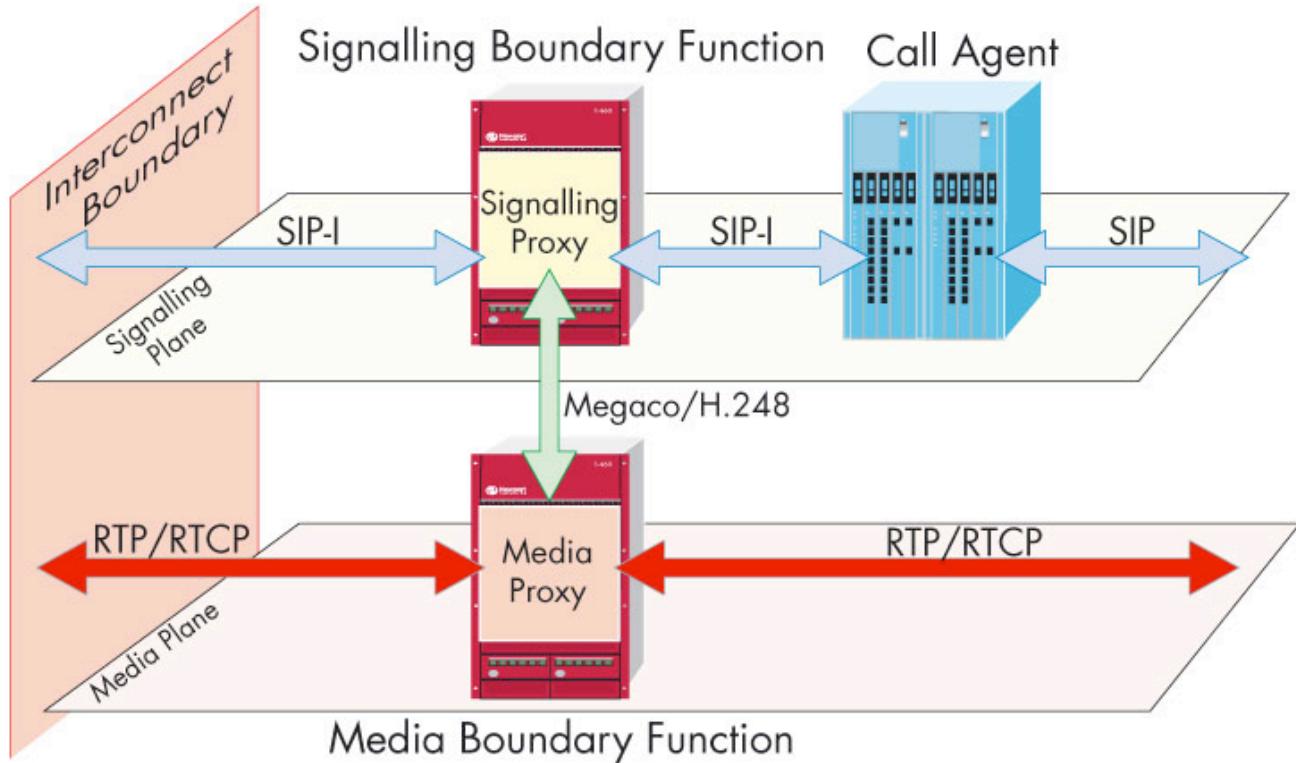
Getting Access to Signalling and Media

- ♣ Intercept model assumes communications nodes can access signalling and media
- ♣ In VoIP Networks they are separated – often in different devices
- ♣ Session control devices are already aware of signalling media relationships



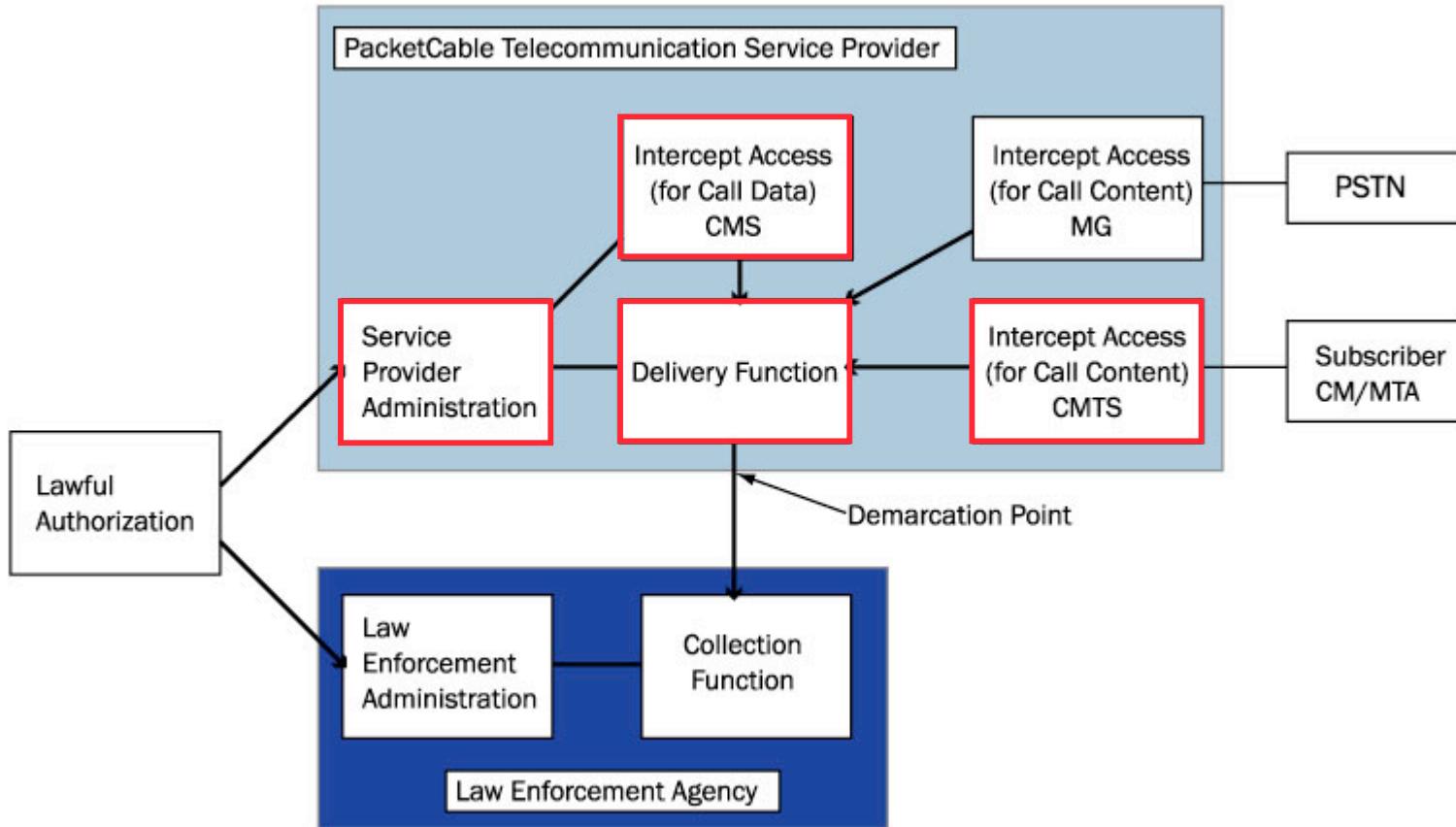
Split between signalling and voice

Traffic Data (Signalling)
Communications Data (Media)



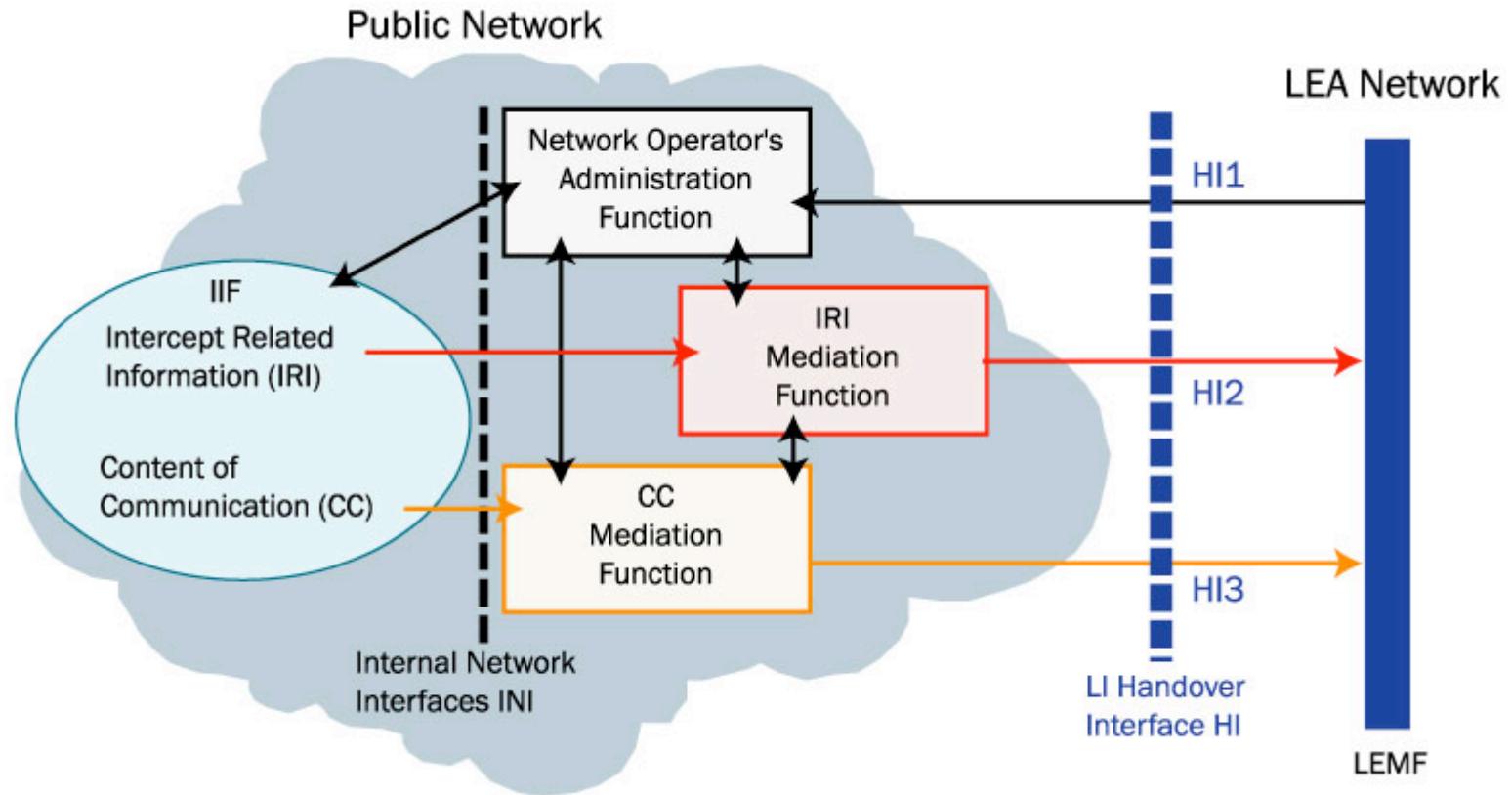
NB – in VoIP networks the Media and Signalling can take different paths
NB – Anti-tomboning may mean the media is not even in the same network as signalling

PacketCable™ Architecture Conceptual



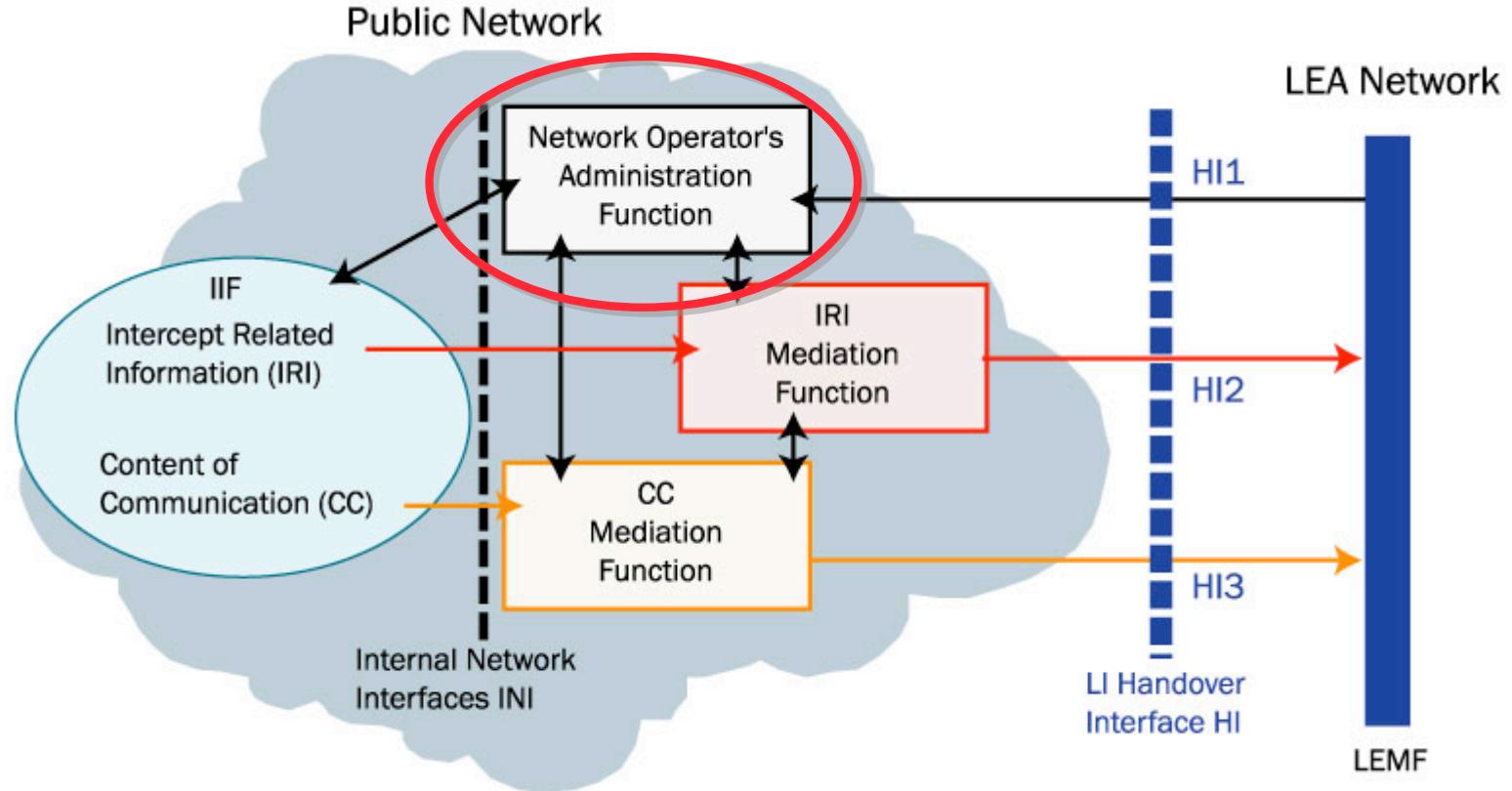
- ♣ PacketCable™ surveillance model - CALEA compliant
- ♣ The same basic arrangements as ETSI

ETSI Architecture Conceptual



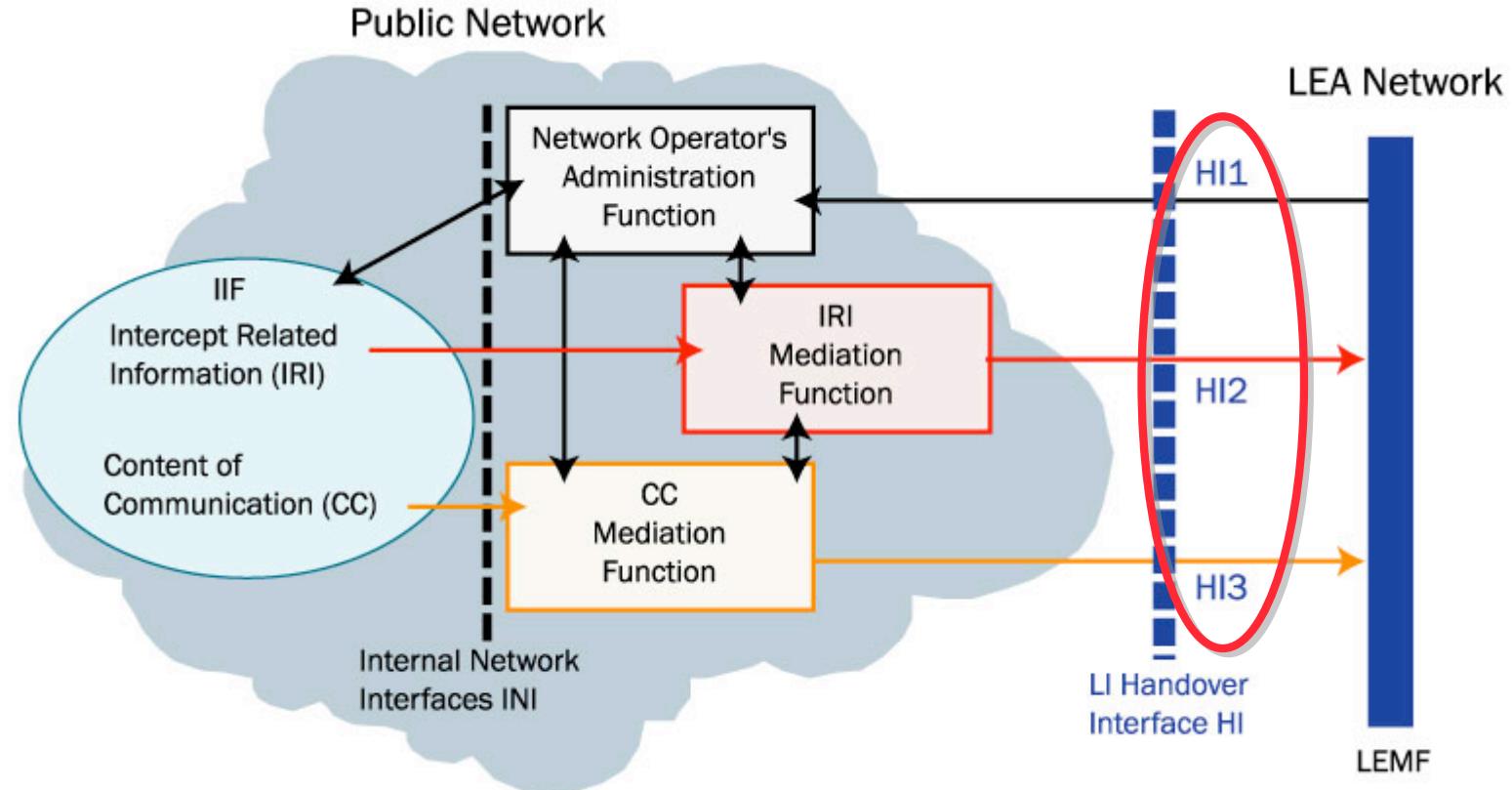
- ♣ General Networks architecture for Intercept (ETSI)

LI Elements – Administration Function



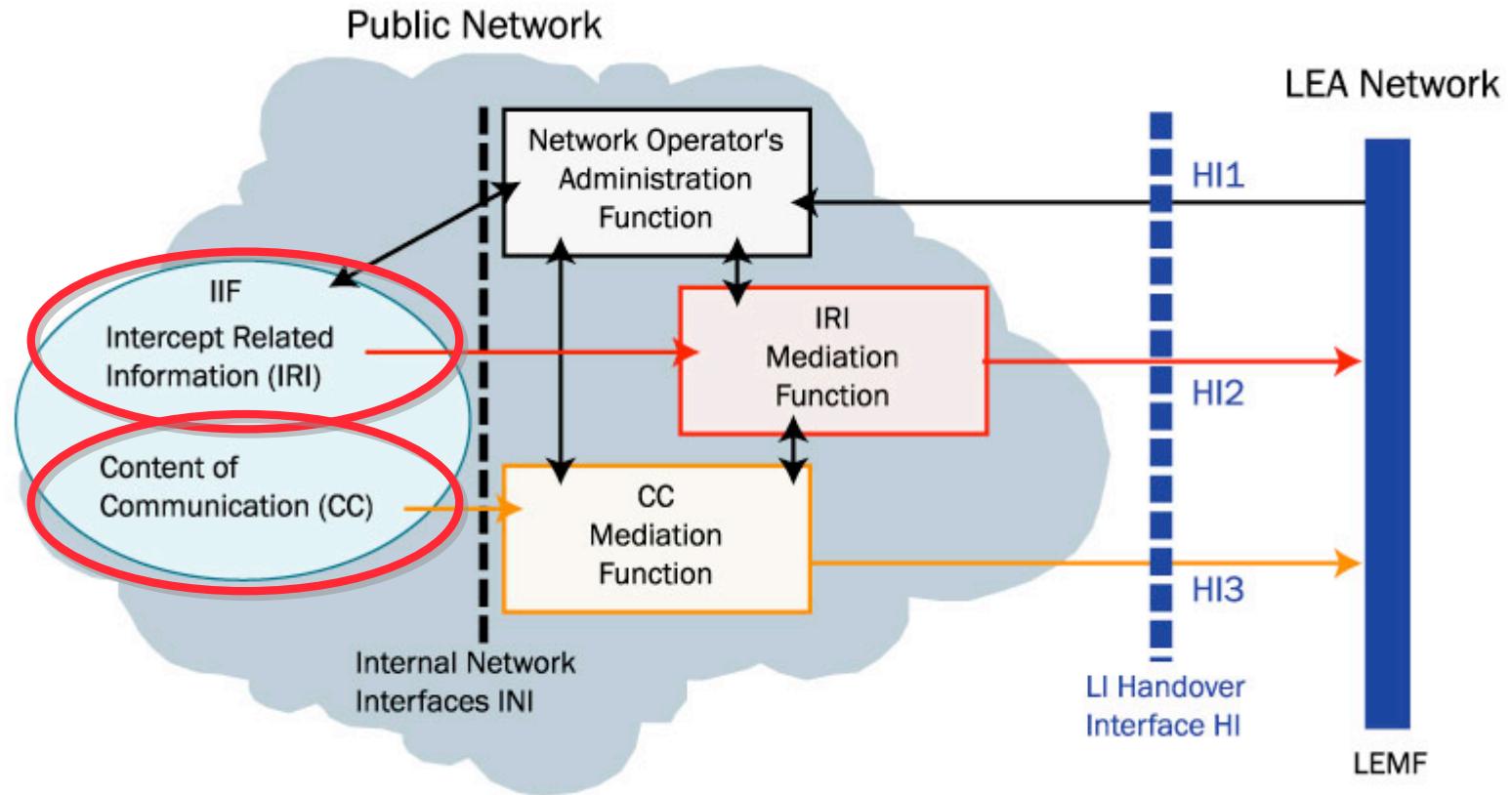
- ♣ The Network Operator implements interception warrants via the Administration Function
- ♣ The Administration Function manages the Intercept Function in the network nodes and the Media Functions

LI Elements – Handover Interfaces



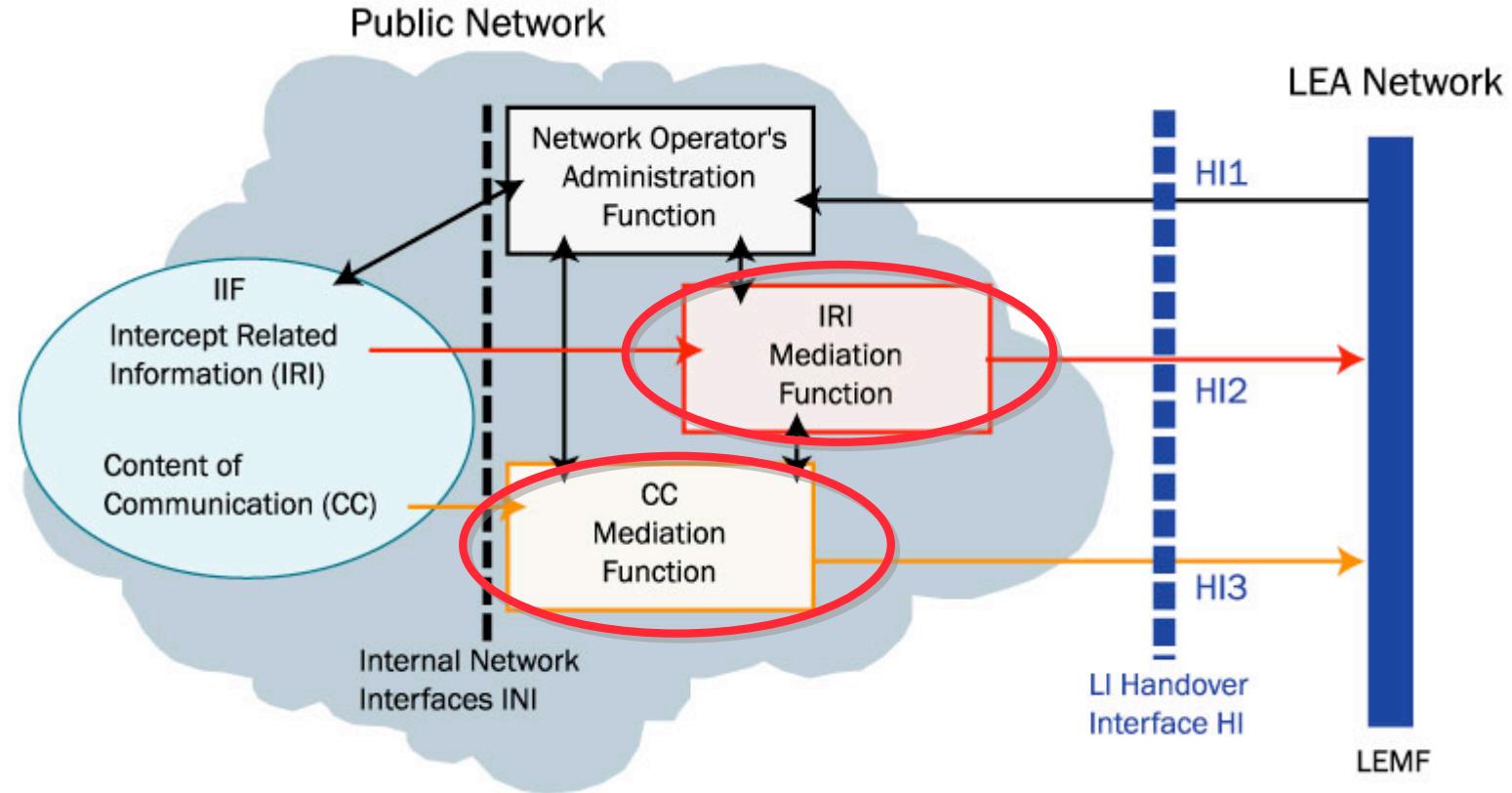
- ♣ Three Handover Interfaces link the Public and LEA networks
 - ♣ HI1 – Administration input
 - ♣ HI2 – IRI delivery to Law Enforcement Monitoring Facility (LEMF)
 - ♣ HI3 – CC delivery to LEMF

LI Elements – Interception Function



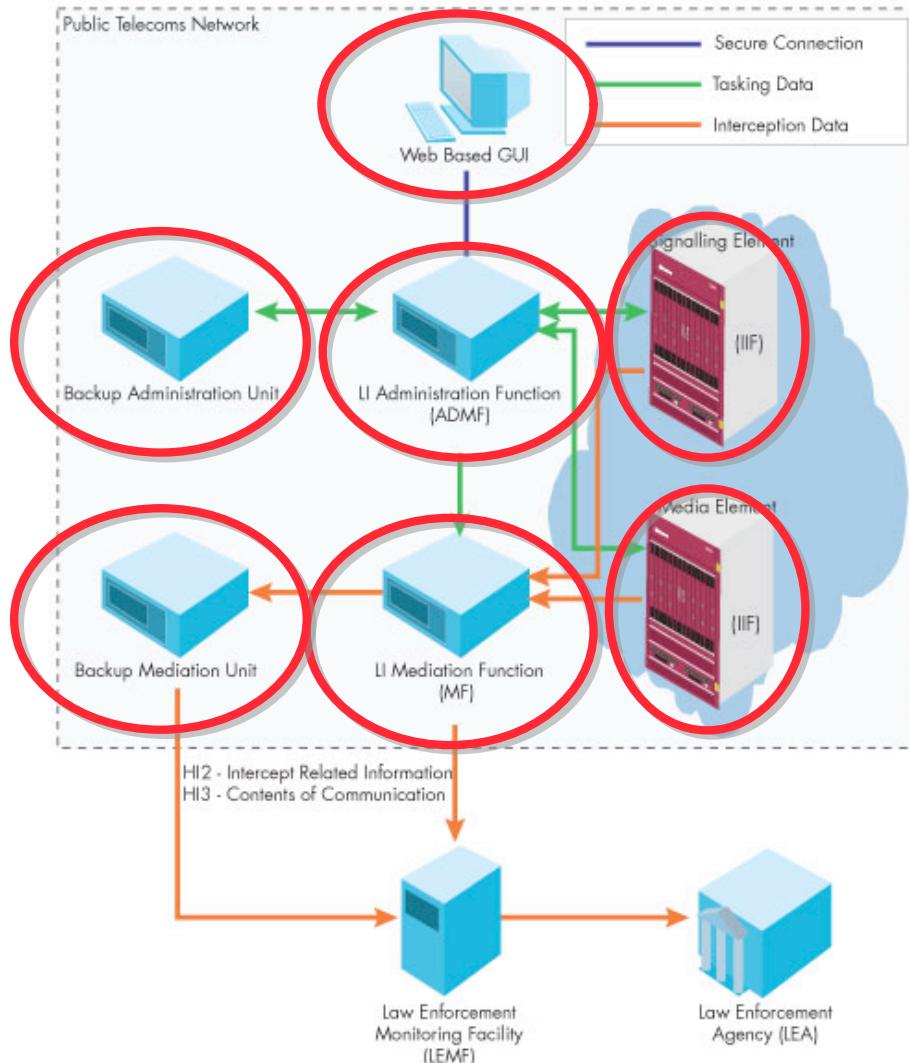
- ♣ Internal Intercept Functions (IIF) implemented in network nodes
- ♣ Warrant may require IRI, CC or both

LI Elements – Mediation Function



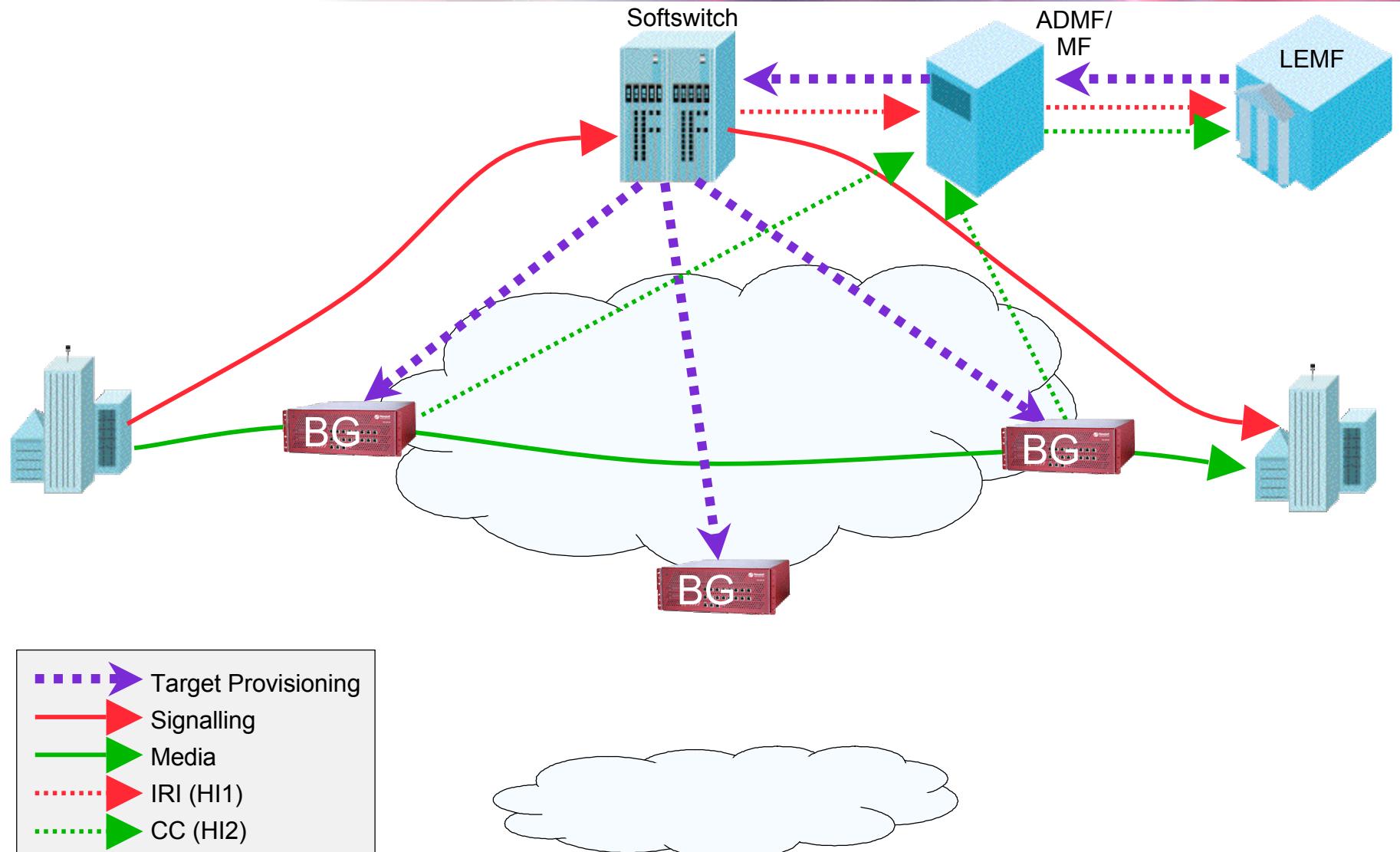
- ♣ Mediation Functions convert deliver Intercept Information to the LEMF over standard interfaces, HI2, and HI3
- ♣ Delivery may be IRI, CC or both

Architecture - Physical

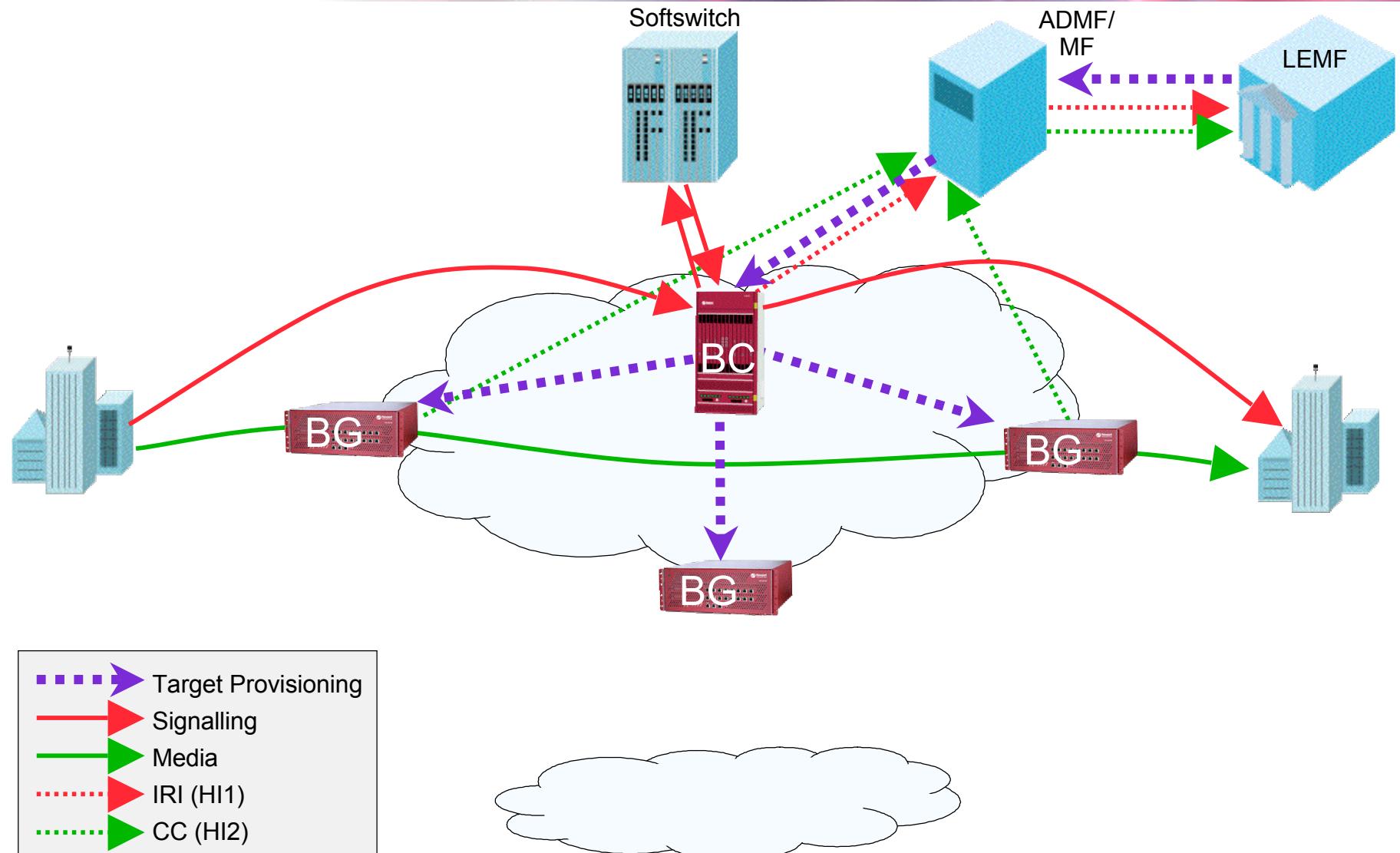


- ♣ Intercept Functions present on both signalling (IRI) and media (CC) elements
- ♣ Management Unit runs the Administration Function, performs provisioning and monitoring.
- ♣ Handover Unit runs the Mediation Function, performs buffering, validation and country-specific delivery.
- ♣ Both units backed up by warm standbys with automatic replication of data between peers.

Central Softswitch and Distributed Gateways



Central Controller and Distributed Gateways



Conclusion

- ♣ Networks will continue to evolve to support Multimedia services
- ♣ Separated signalling and multiple media paths will become prevalent
- ♣ Distributed (edge) elements – Gateways and Controllers are strategically located to facilitate target acquisition
- ♣ A flexible approach is essential to allow natural network evolution whilst still meeting both commercial and regulatory needs



Thank You

Questions

Lawful Intercept White Paper:
<http://www.newport-networks.com/whitepapers>