



PSTN/ISDN Emulation & Simulation

Dr. Ghassem Koleyni

Nortel Networks

Tel: +1 613 763 4154

Fax: +1 613 765 6295

ghassem@nortel.com

Content

- o NGN and PSTN/ISDN
- o Emulation and simulation
- o Scenarios
- o Services and evolution
- o Related activities in ITU-T
- o Conclusion

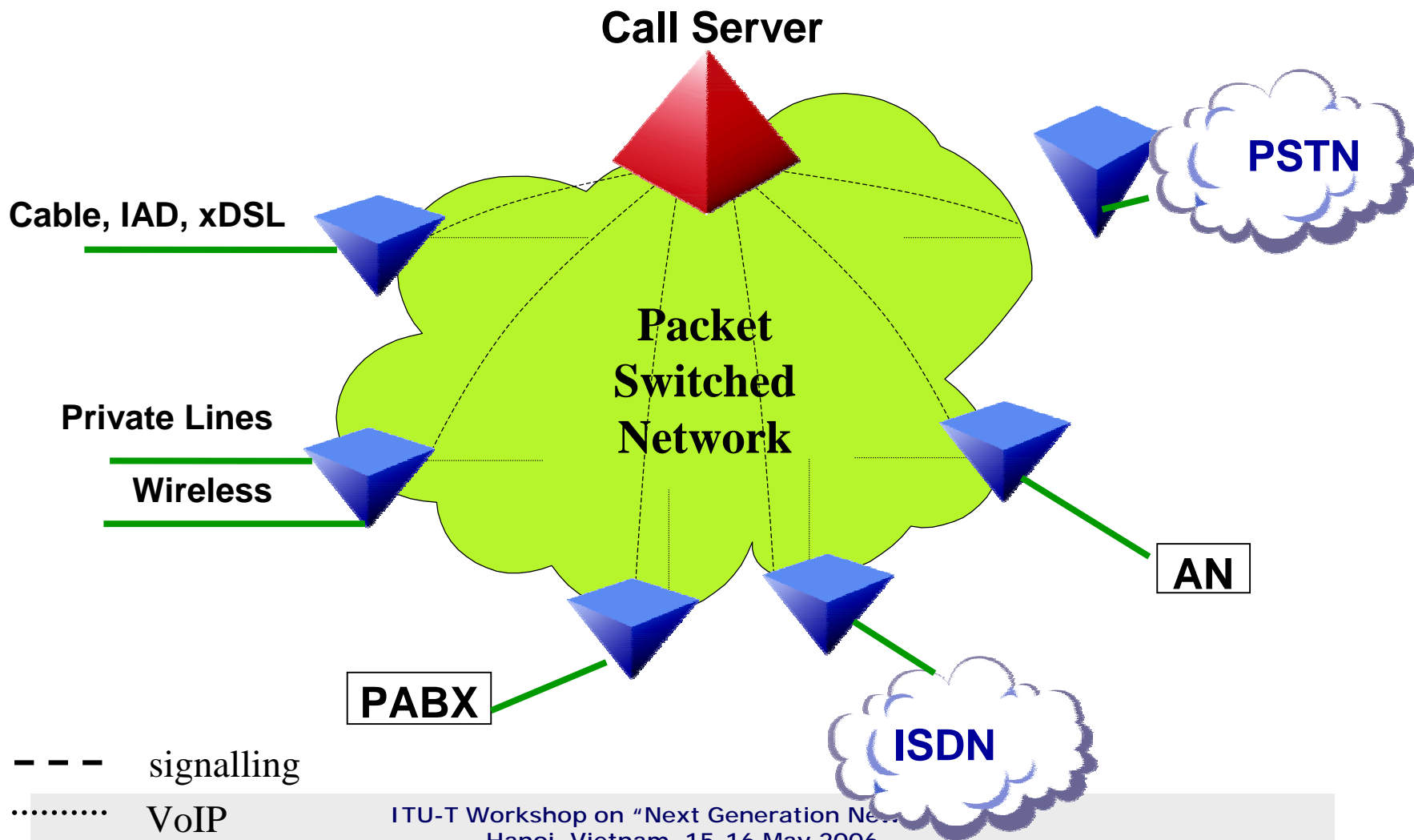
NGN & PSTN/ ISDN

- Call server (CS)-based
 - Equipment re-use
 - Service continuity
- IP multimedia sub-system (IMS)-based
 - Immediate migration
 - Access to new services

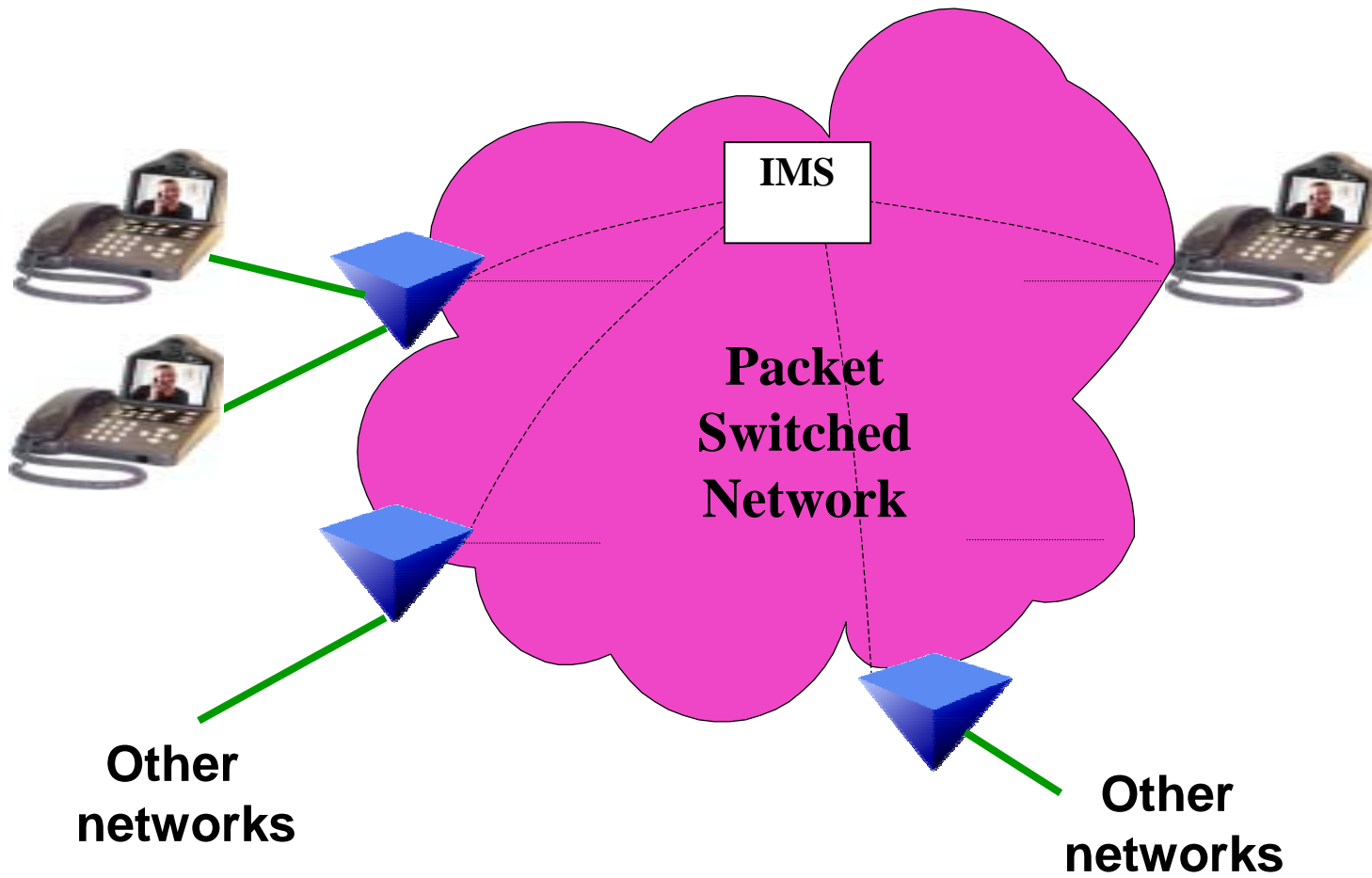


ITU-T

NGN: CS-based



NGN: IMS-based



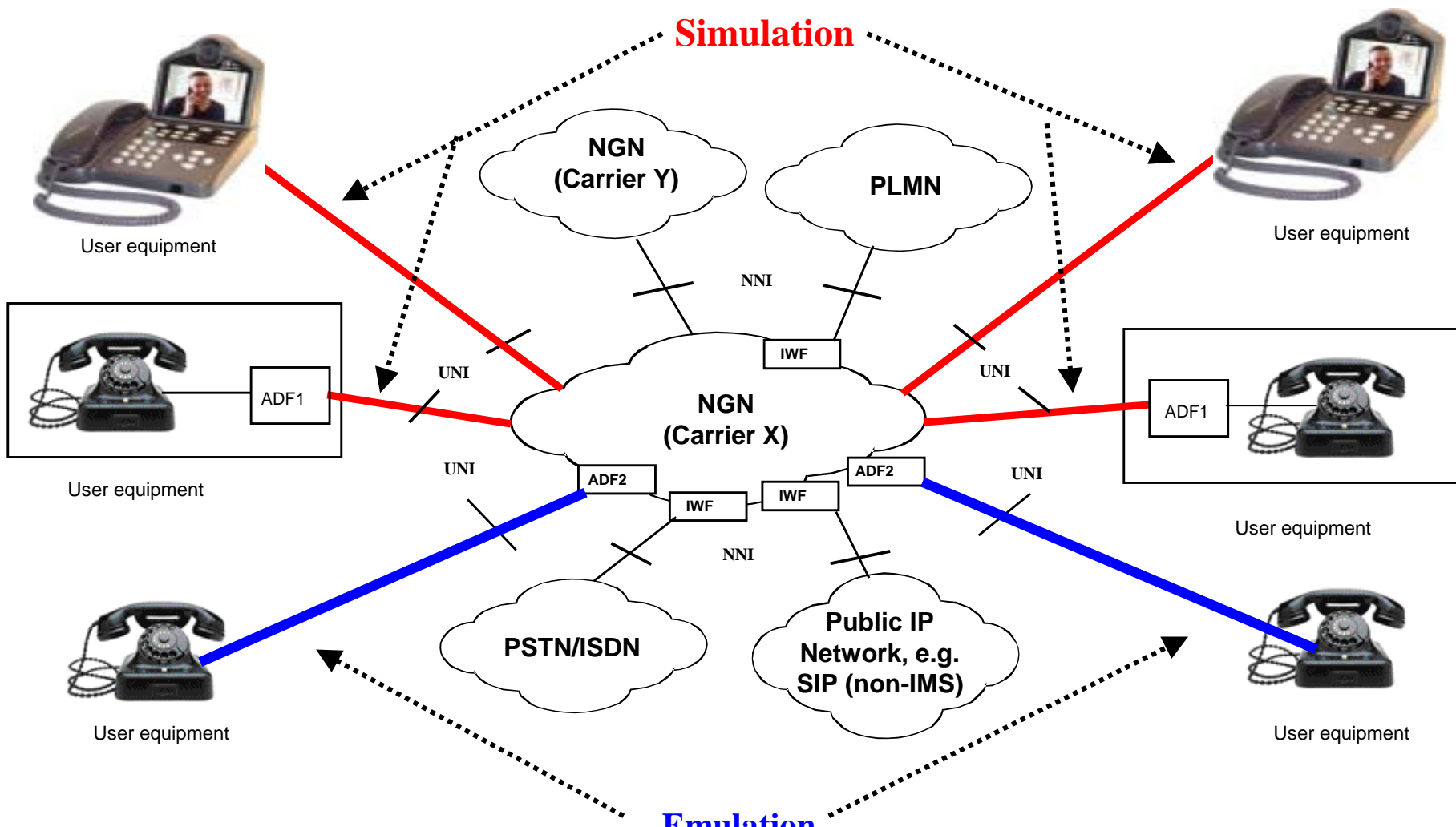
- - - signalling
..... VoIP

Emulation

Provision of **PSTN/ISDN** service capabilities and interfaces using adaptation to an IP infrastructure.

Provision of **PSTN/ISDN-like** service capabilities using session control over IP interfaces and infrastructure

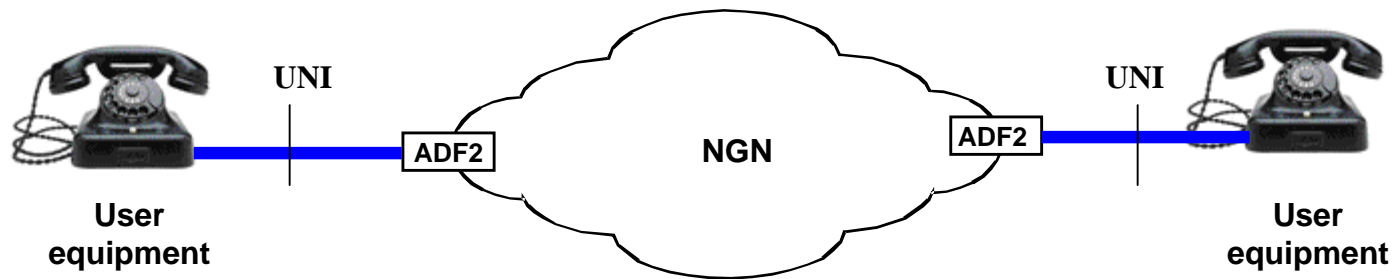
General architecture



UNI = User Network Interface = IF1
 NNI = Network Node Interface = IF2

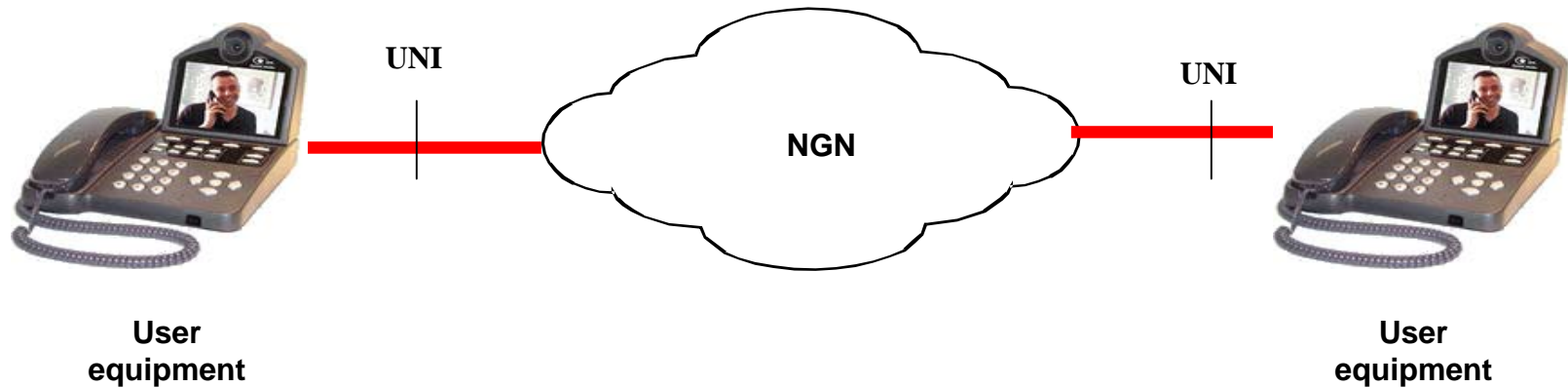
ADF = Adaptation Function
 IWF = Interworking Function

Emulation scenario



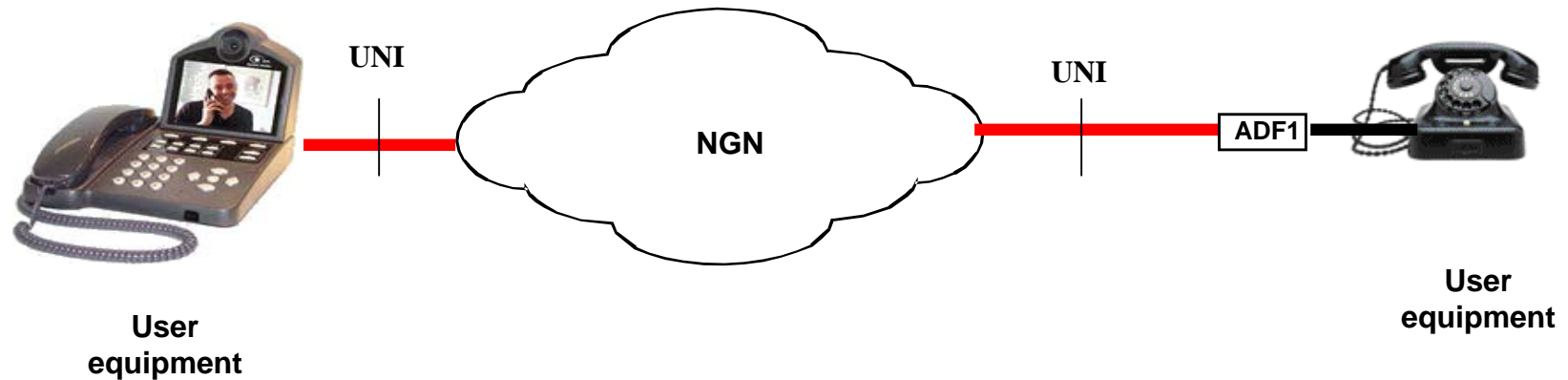
- o An encapsulation process
- o All services available to PSTN/ISDN users
- o User experience not changed by the network transformation

Simulation scenarios - 1

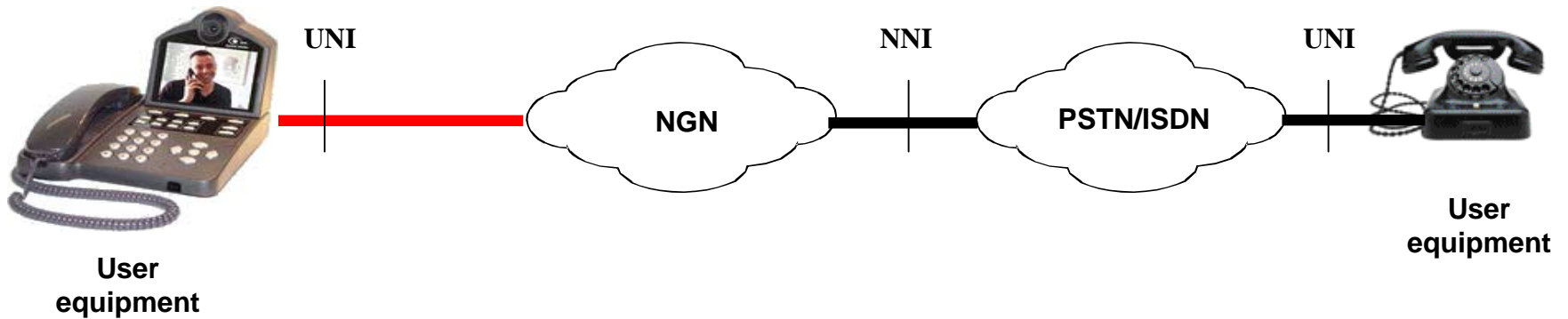


- PSTN/ISDN-like services available
- Availability of possible new services
- User experience is changed by the network transformation

Simulation scenarios - 2

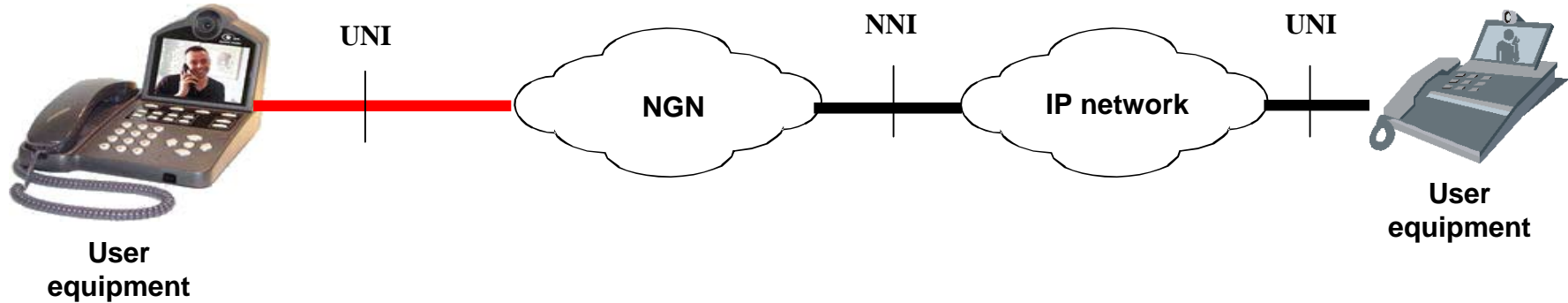


- Only PSTN/ISDN-like services available
- New experience for legacy terminal users



- Service interworking between NGN and PSTN/ISDN is required
- Only PSTN/ISDN-like services available
- Legacy terminal user experience cannot be fulfilled for end-to-end connection

Emulation, simulation & interworking - 2

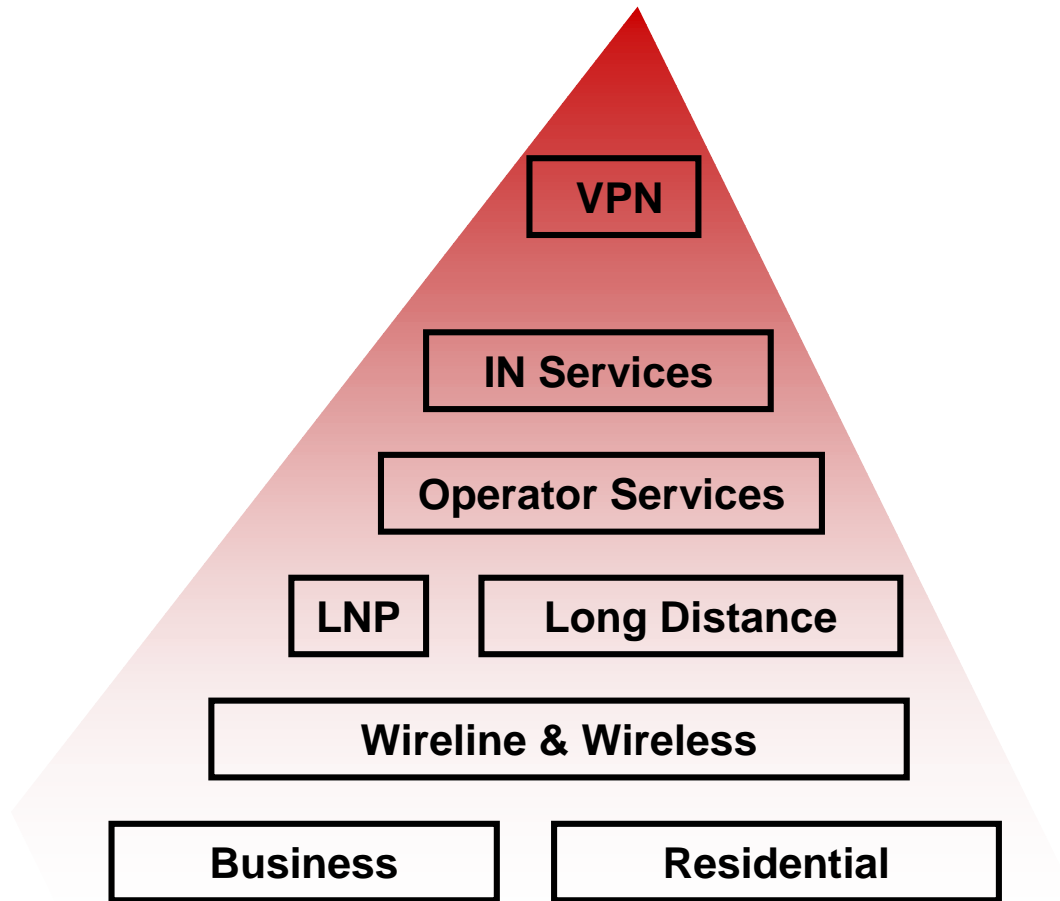


- Service interworking between NGN and IP network is required
- Both the NGN and IP network user experiences may not be fulfilled for end-to-end connection

I SDN services

DDI	CT	CONF
MSN	CFB	3PTY
CLIP	CFNR	CUG
CLIR	CFU	PNP
COLP	CD	CRED
COLR	LH	AOC
MCI	CW	REV
SUB	HOLD	UUS

Additional legacy services



Continuity of providing services is essential

Questions to ask

- Have all these services been universally used by majority of the operators?
- Have all these services provided value to the operators and the end users?
- Are there new services provided by NGN which are as good as the old ones and some are new?
- Should care be taken in selecting services for emulation or simulation?

Where are we now in ITU-T?

- o Described emulation and simulation
- o Many aspects related to emulation and simulation have been considered
- o Emulation and simulation scenarios identified
- o Requirements for public interest services

Future work

- Examine existing services and select candidates for emulation and simulation
- Identify additional service capabilities
- Address OAM, management and control & signalling aspects
- Identify protocols

Conclusion

- Substantial progress has been made in the preparation of initial specifications addressing evolution of networks to NGN
- Good progress on PSTN/ISDN emulation and simulation
- More works needs to be done to complete control and signalling aspects for PSTN/ISDN evolution



List of Acronyms

ITU-T

AN	Access Network	IMS	IP Multimedia Sub-system
AOC	Advice of Charge	IN	Intelligent Network
ATM	Asynchronous Transfer Mode	IP	Internet Protocol
CCBS	Completion of Calls to Busy Subscriber	ISDN	Integrated Services Digital Network
CD	Call Deflection	ISUP	ISDN User Part
CFB	Call Forwarding Busy	IWF	Interworking Function
CFNR	Call Forwarding No Reply	IXC	IntereXchange Carrier
CFU	Call Forwarding Unconditional (CFU)	LH	Line Hunting
CLIP	Calling Line Identification Presentation	LNP	Local Number Portability
CLIR	Calling Line Identification Restriction	MCI	Malicious Call Identification
COLP	Connected Line Identification Presentation	MLPP	Multi-Level Precedence and Preemption
COLR	Connected Line Identification Restriction	MSC	Mobile Switching Centre
CONF	Conference Calling	MSN	Multiple Subscriber Number
CRED	Credit Card Calling	PLMN	Public Land Mobile Network
CS	Call Server	PNP	Private Numbering Plan
CT	Call Transfer (CT)	PSTN	Public Switched Network
CUG	Closed User Group	QoS	Quality of Service
CW	Call Waiting	REV	Reverse Charging
DDI	Direct-Dialling-In	SIP	Session Initiation Protocol
DSL	Digital Subscriber Line	SIP-I	Refers to Rec. Q.1912.5
HOLD	Call Hold	SUB	Sub-addressing
IAD	Integrated Access Device	UUS	User-to-User Signalling
		VoIP	Voice over IP
		VPN	Virtual Private Network
		3PTY	Three Party Service

Thank you for your attention