>THIS IS **THE WAY**

Network Evolution to NGN

Dr. Ghassem Koleyni
Nortel Networks

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Jeju Island, South Korea

Phone: +1-613-763-4154
Fax: +1-613-765-6295
Email: ghassem@nortel.com

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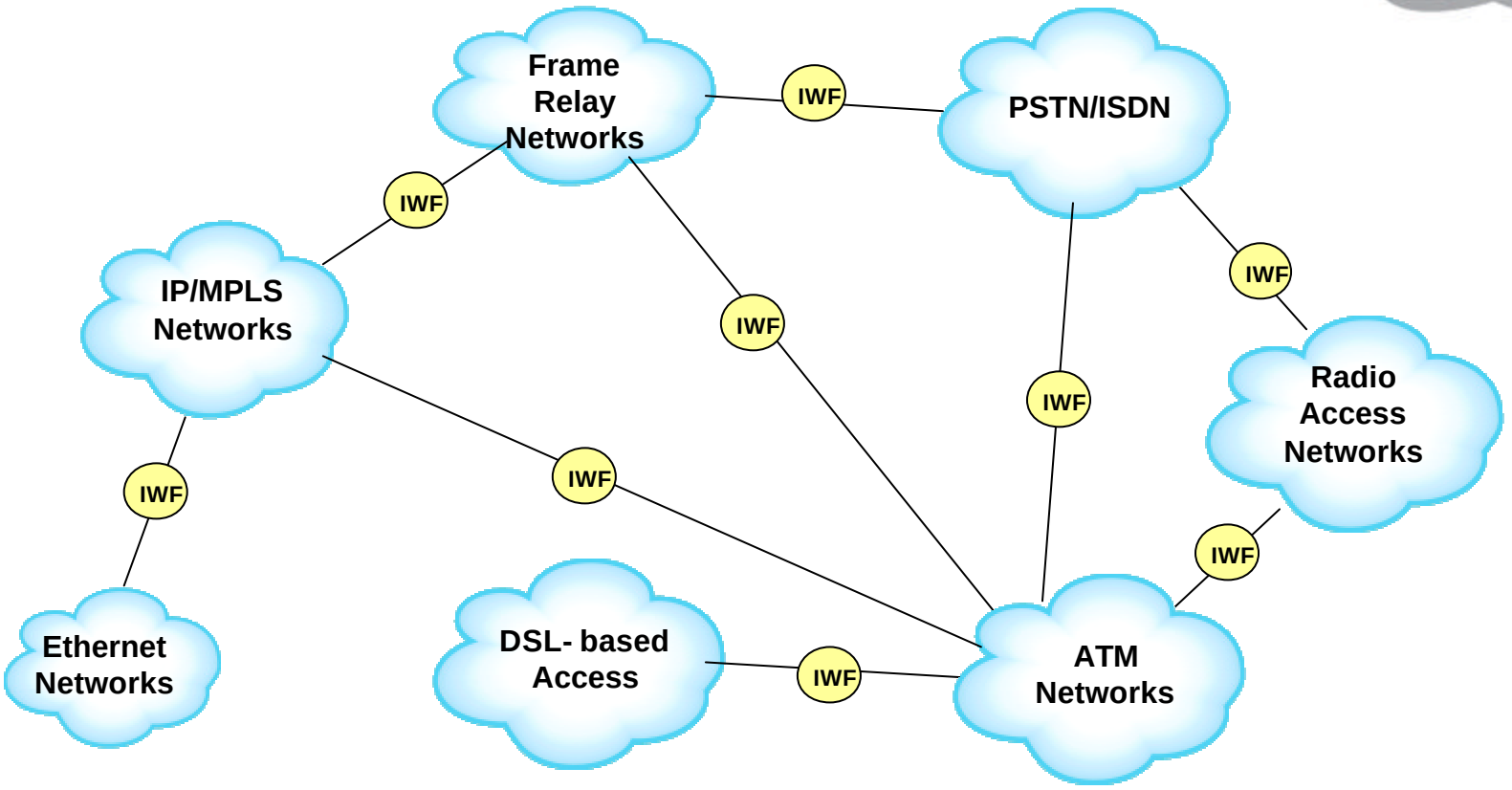
Outline

- Today’s network architecture
- Evolution
- Drivers of network evolution
- Network evolution transition path
- PSTN/ISDN emulation and simulation
- Simulation versus emulation

Today's Network Architectures



- Multiple, interworked, interdependent networks
- Diversity of control and management architectures
- Capacity and performance bottlenecks
- Each network has its own control plane and management plane

Evolution

A gradual process of change and development into a more complex or better form

- **Revenue generator**
- **Converged**
- **Personalized**
- **Interactive**
- **Multimedia**
- **Simplified**
- **Secure, trusted and reliable**
- **Extended service offering**

Drivers of Network Evolution - 1

New revenue opportunities

- Investing in new broadband deployment
- Geographical expansion
- Providing service innovation (e.g. VPN)
- Decreased time-to-market

Cost reduction

- Evolving legacy networks to packet infrastructure
  - Reducing OPEX
  - Streamline operations
- Centralized management
- Centralized control

Drivers of Network Evolution - 2

Management

- Scalability
- Billing

QoS & security

- Higher reliability
- Higher resiliency
- Secure systems
- Robustness
- Performance
- Application performance
- Authentication, Authorization and Accounting

Drivers of Network Evolution - 3

Ubiquity

- A ubiquitous network enabling user to be connected - always on, anytime, anywhere, anyhow
- Presence awareness

Content

- Digital Rights Management (DRM)
- Conditional access

Network optimization

- Common services infrastructure
- Fewer number of network nodes
- Fewer switching operations
- Simplified service deployment
- Higher capacity

Drivers of Network Evolution - 4

Interoperability

- Interoperable equipments from all vendors

Multitude of access networks

- Fixed, mobile, copper, fibre, wireless…….
- Transparent mobility across wireline & wireless

Shared resources

- Shared voice & data resources

Mixing of traditional and internet service

- Ability to combine traditional circuit switched communication services and IP services

Drivers of Network Evolution - 5

Interactivity

- End-to-end interactivity
- Personalized interactive multimedia communication
- Gaming
  - High performance and low latency
- User control

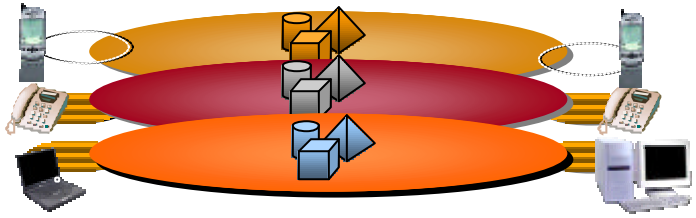
Storage

- Business continuity
- Data retention

Standards compliant

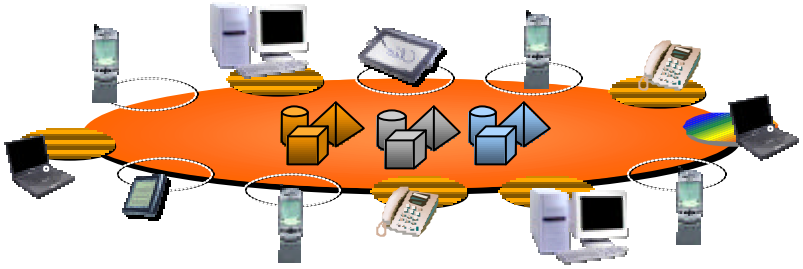
- Implementing standards compliant devices
  - Standardized protocols and interfaces

Network Evolution – How It's Done



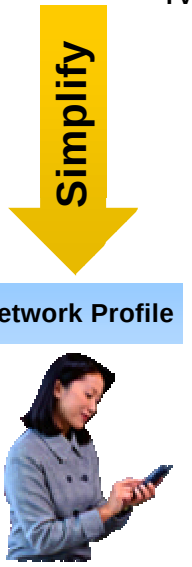
Existing

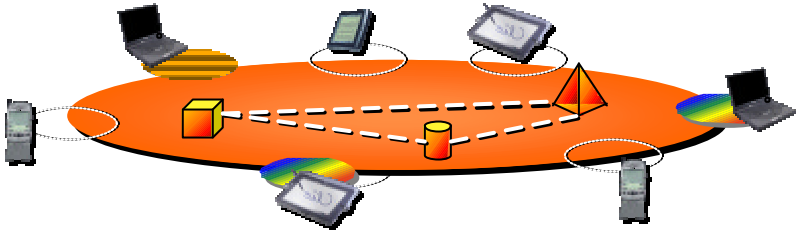
- Multiple networks
- Simple devices
- Disparate services



Transition

- Converged packet network
- Multimedia devices
- Linked services

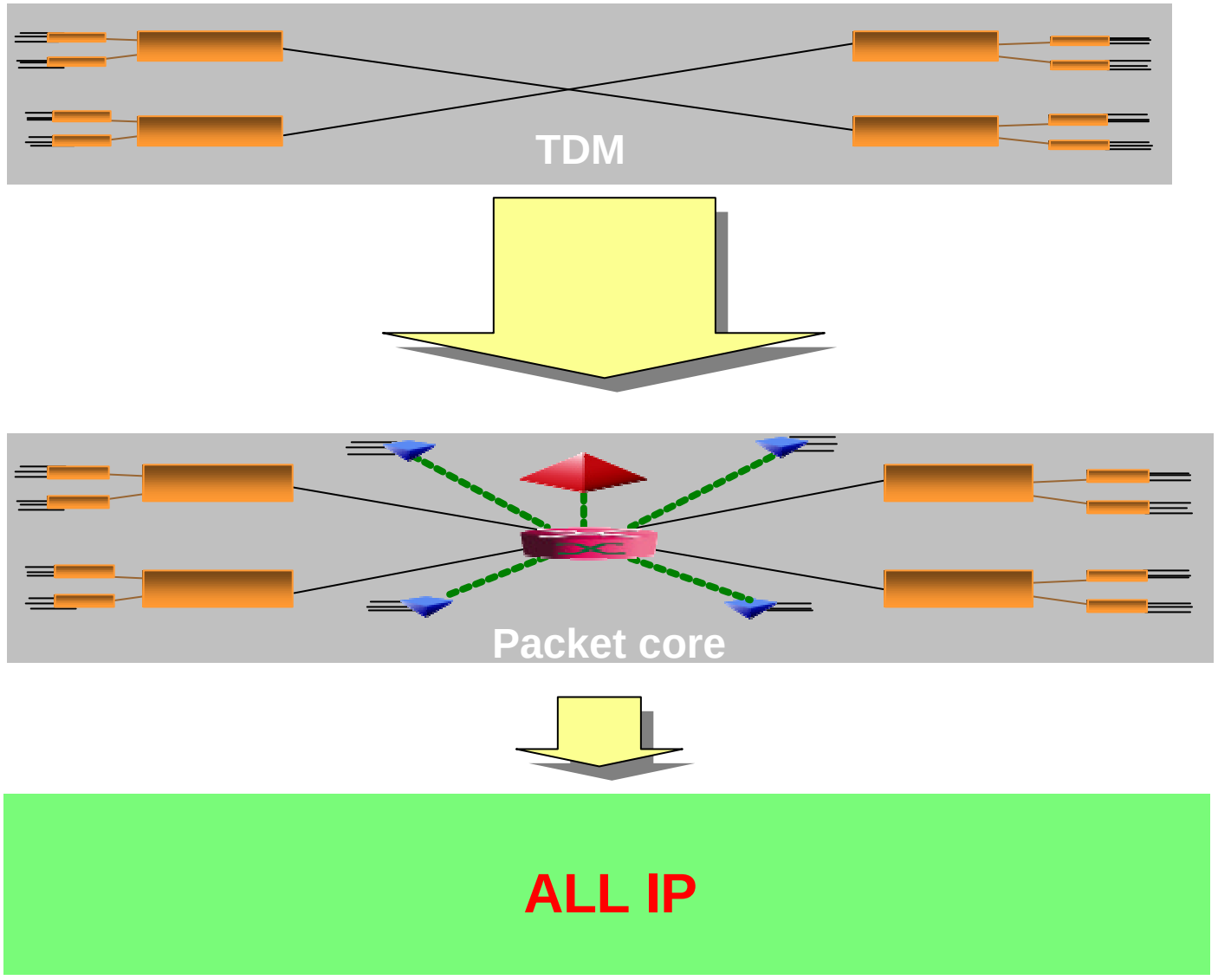




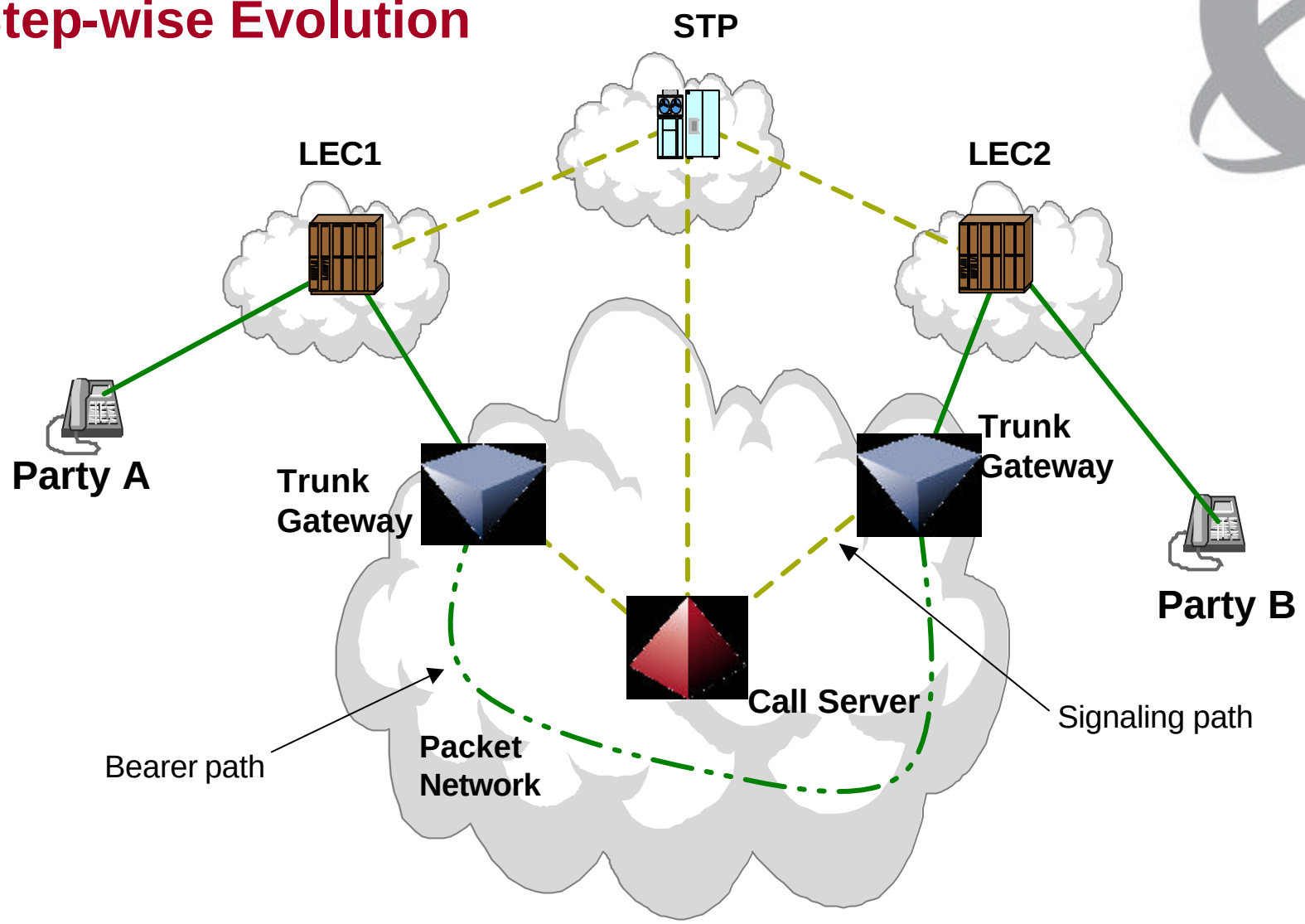
Evolution

- Dynamic packet/ optical network
- Secure multimedia services
- Ubiquitous broadband
- Integrated functionality

Network Evolution – PSTN/ISDN Transition Path

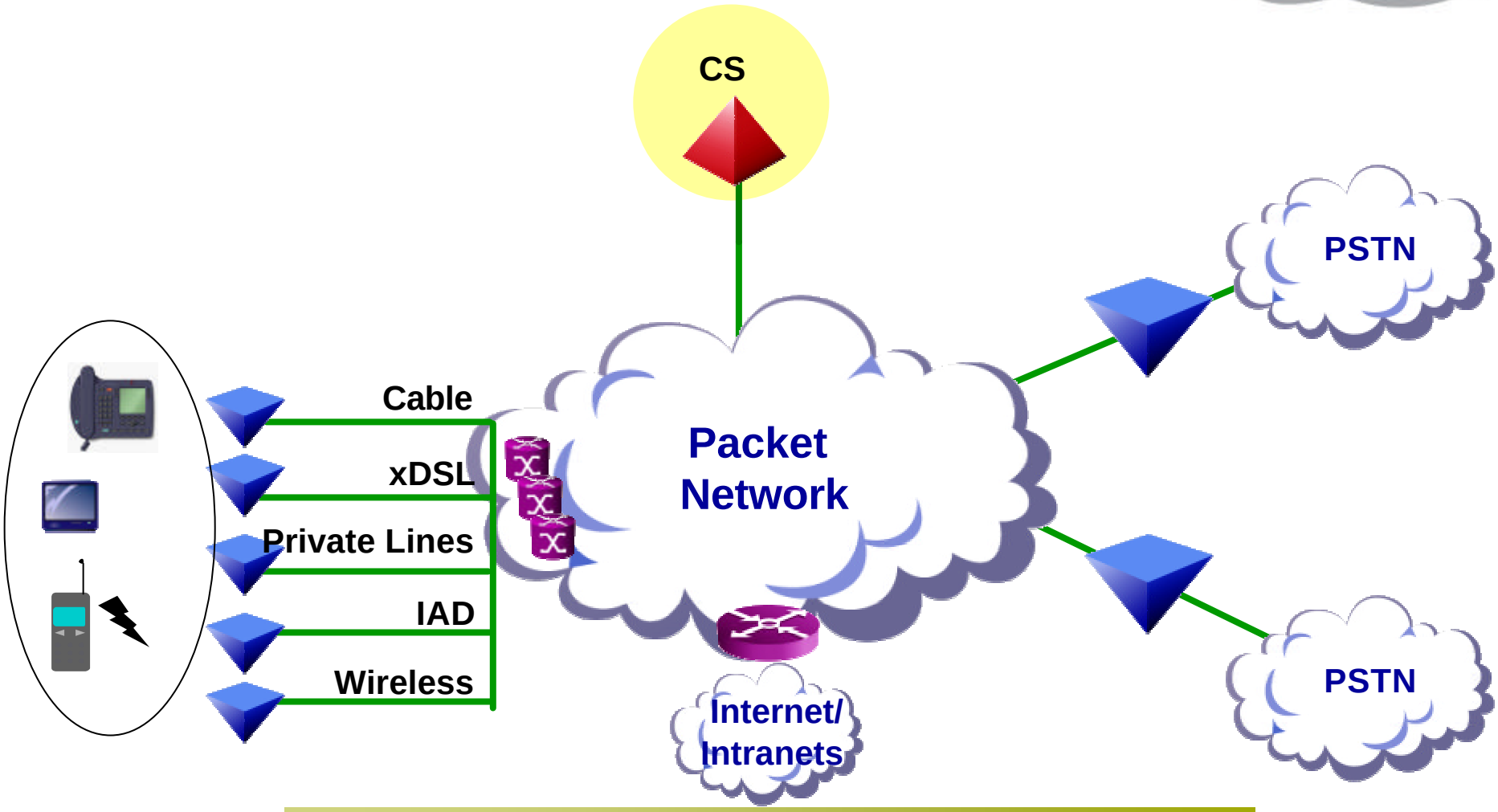


Step-wise Evolution



Hybrid circuit and packet switched networks

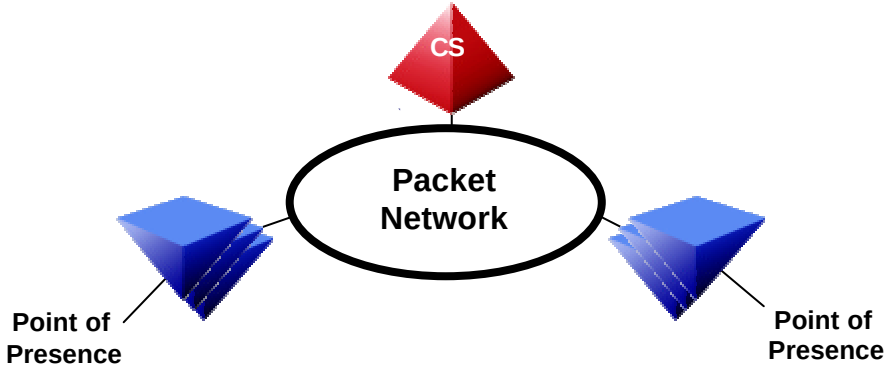
Multitude of Access Networks and Use of Gateways



Utilizing gateways and call servers

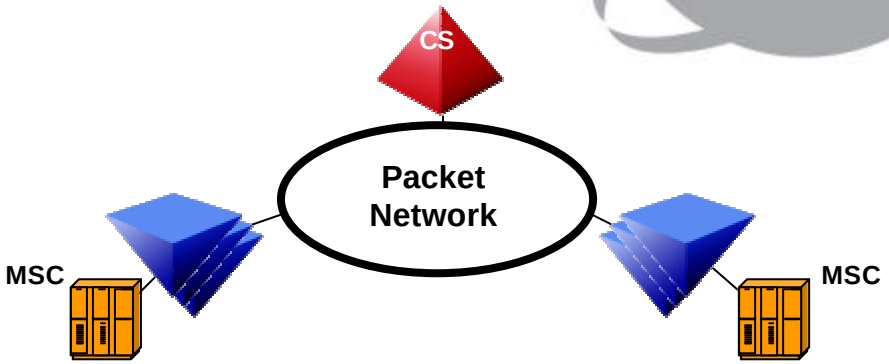
Examples of use of call servers and gateways

Long Distance VoIP Solution



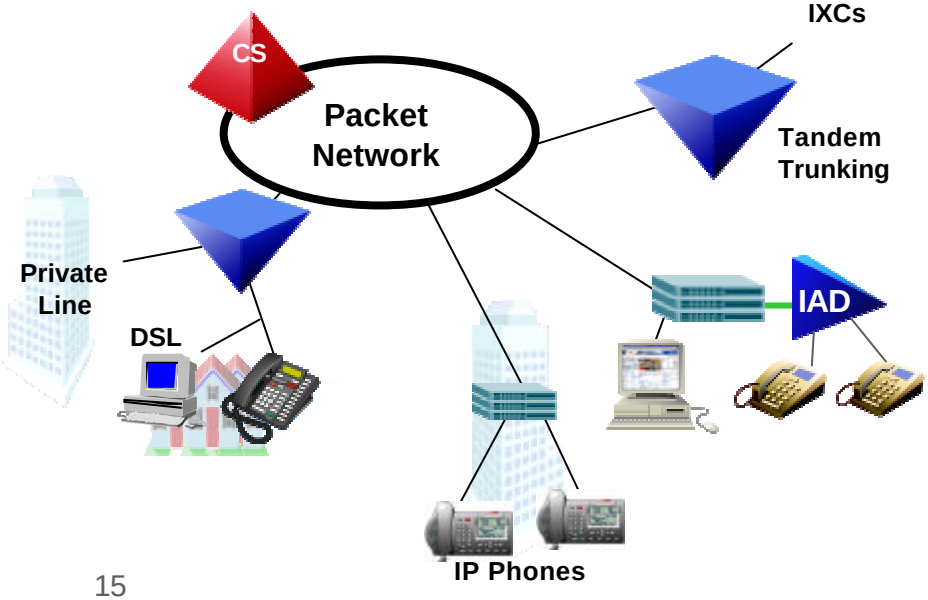
National LD and International Gateways

Wireless VoIP Solution

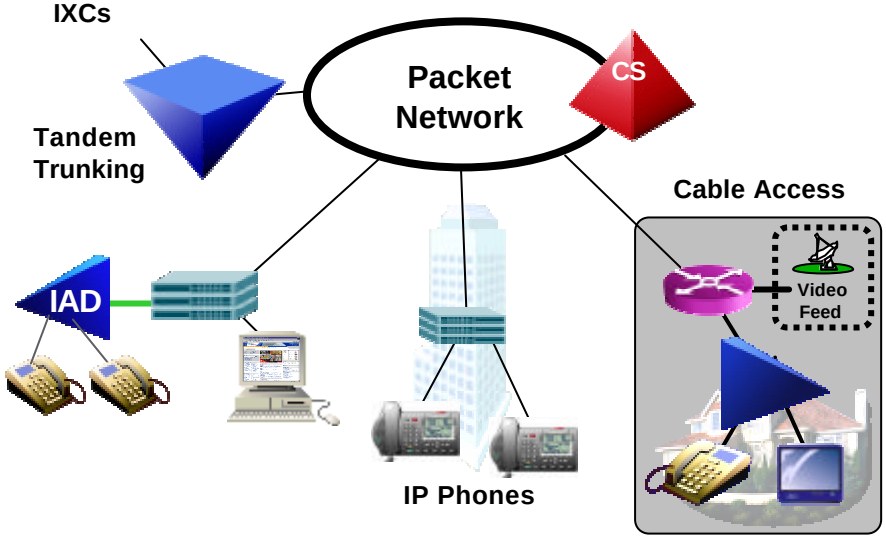


Wireless Transport Between MSCs

Local VoIP Solution



Cable VoIP Solution



PSTN/ISDN Emulation & Simulation

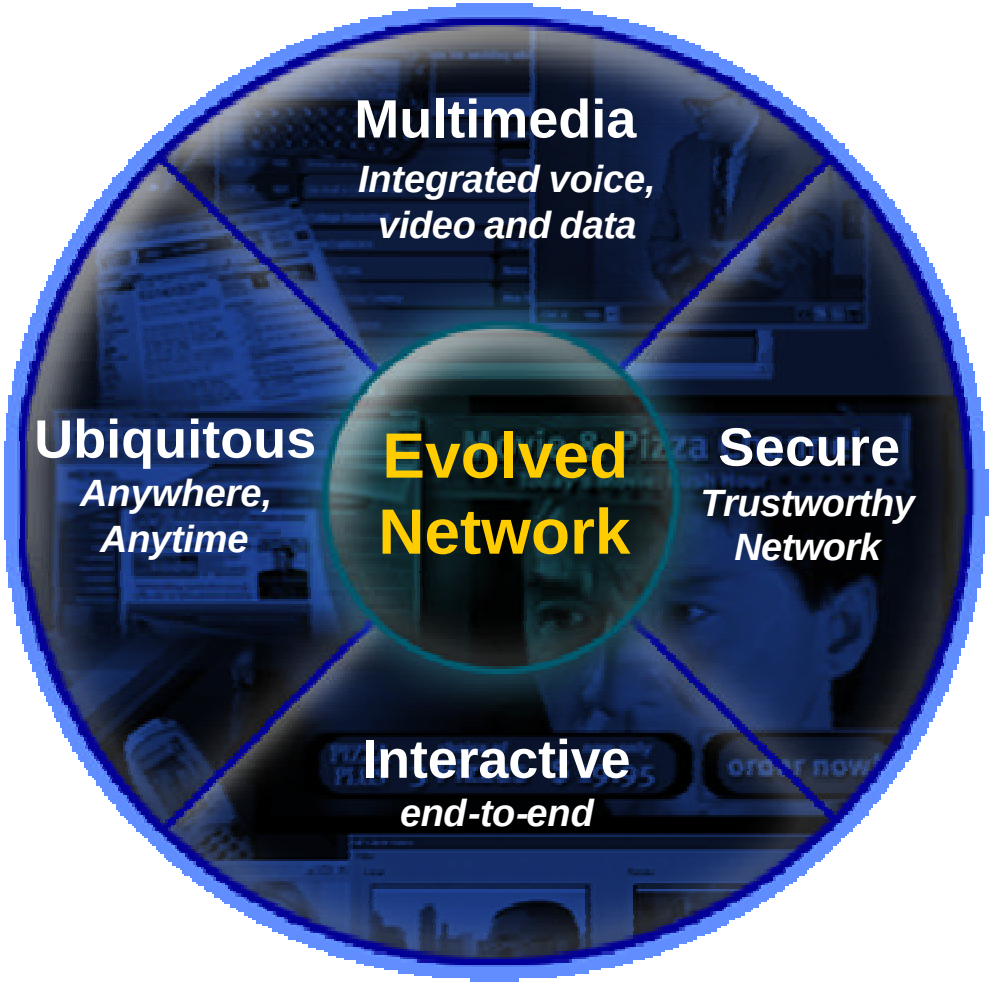
Emulation

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

Simulation

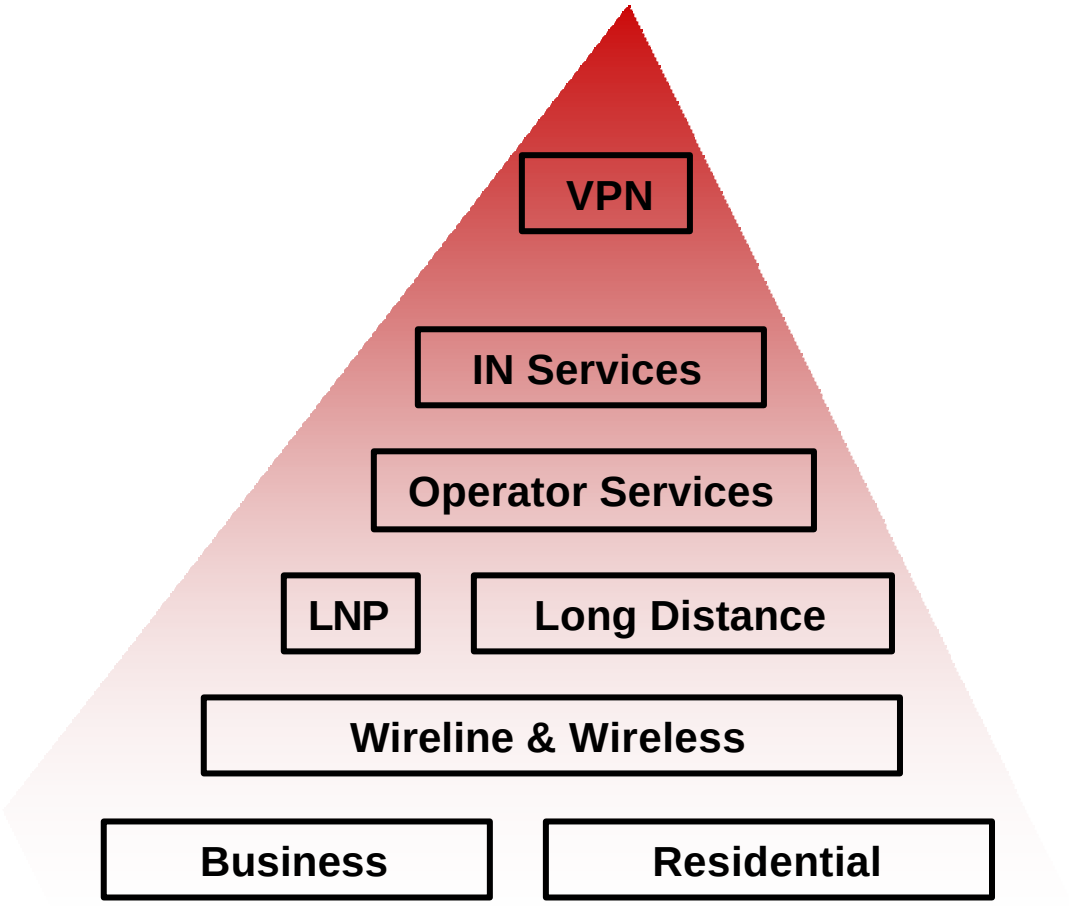
- **Provision of PSTN/ISDN-like service capabilities using session control over IP interfaces and infrastructure**

What is Expected?



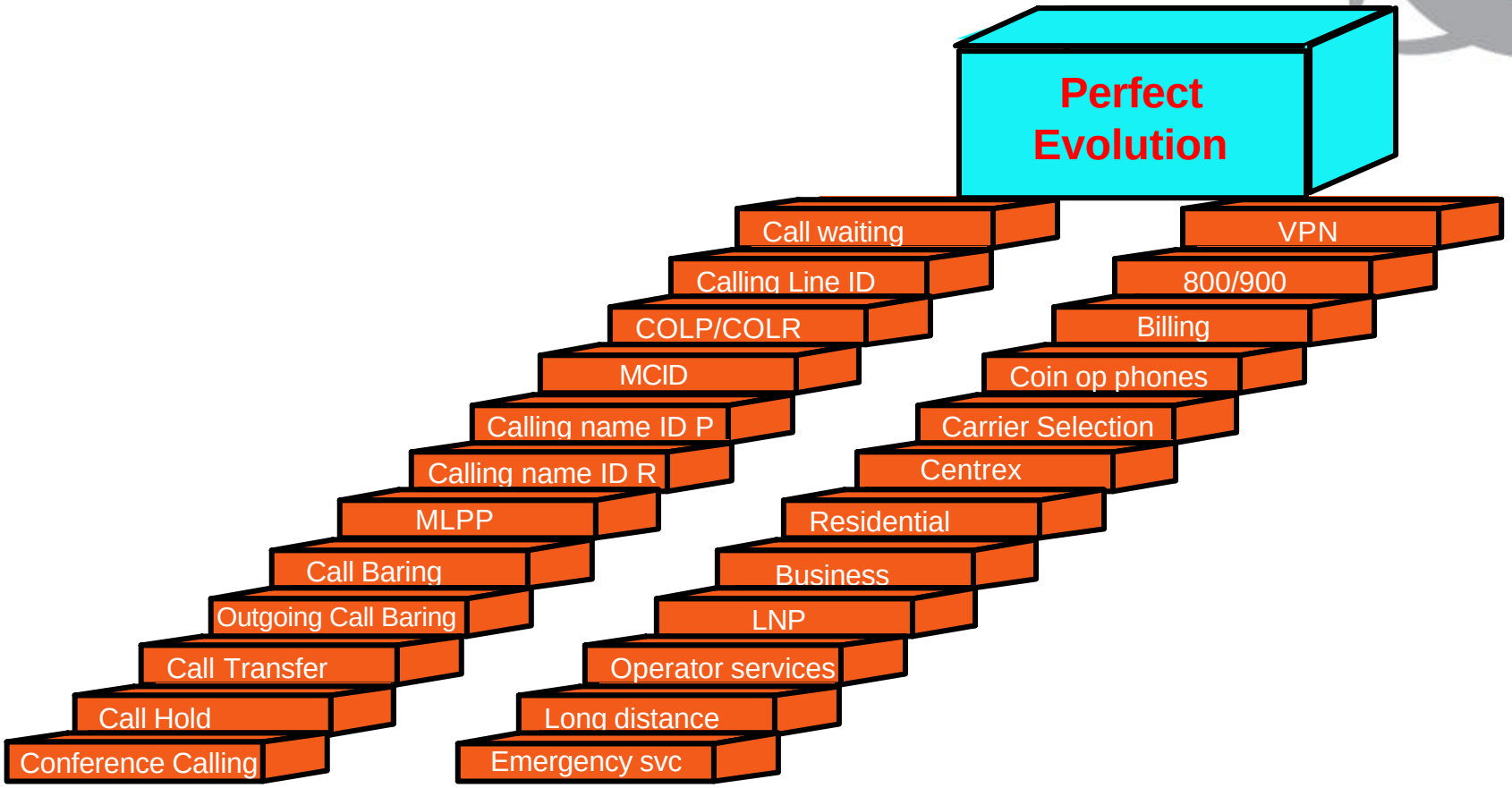
Major reason for, and expectation from, Network evolution

Things to Consider



Maintaining service transparency is essential in emulation

How to Get There?



Almost all can be evolved when doing emulation but not for simulation

PSTN/ISDN Evolution - Regulatory Compliance

Legal intercept

- Call identifying and content to be delivered to the Law Enforcement Agency

Emergency services

- Local and toll network requirements in most countries

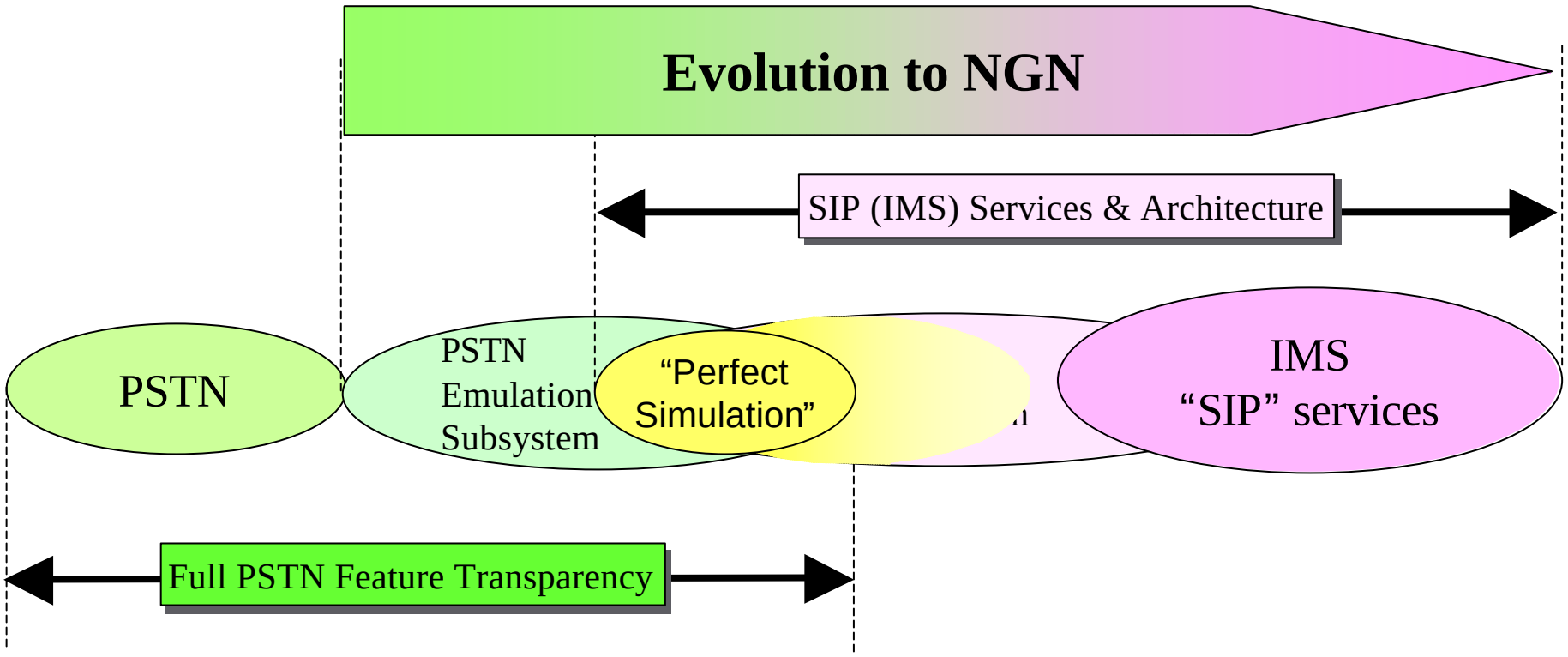
Local number portability

- LNP already mandatory in many countries

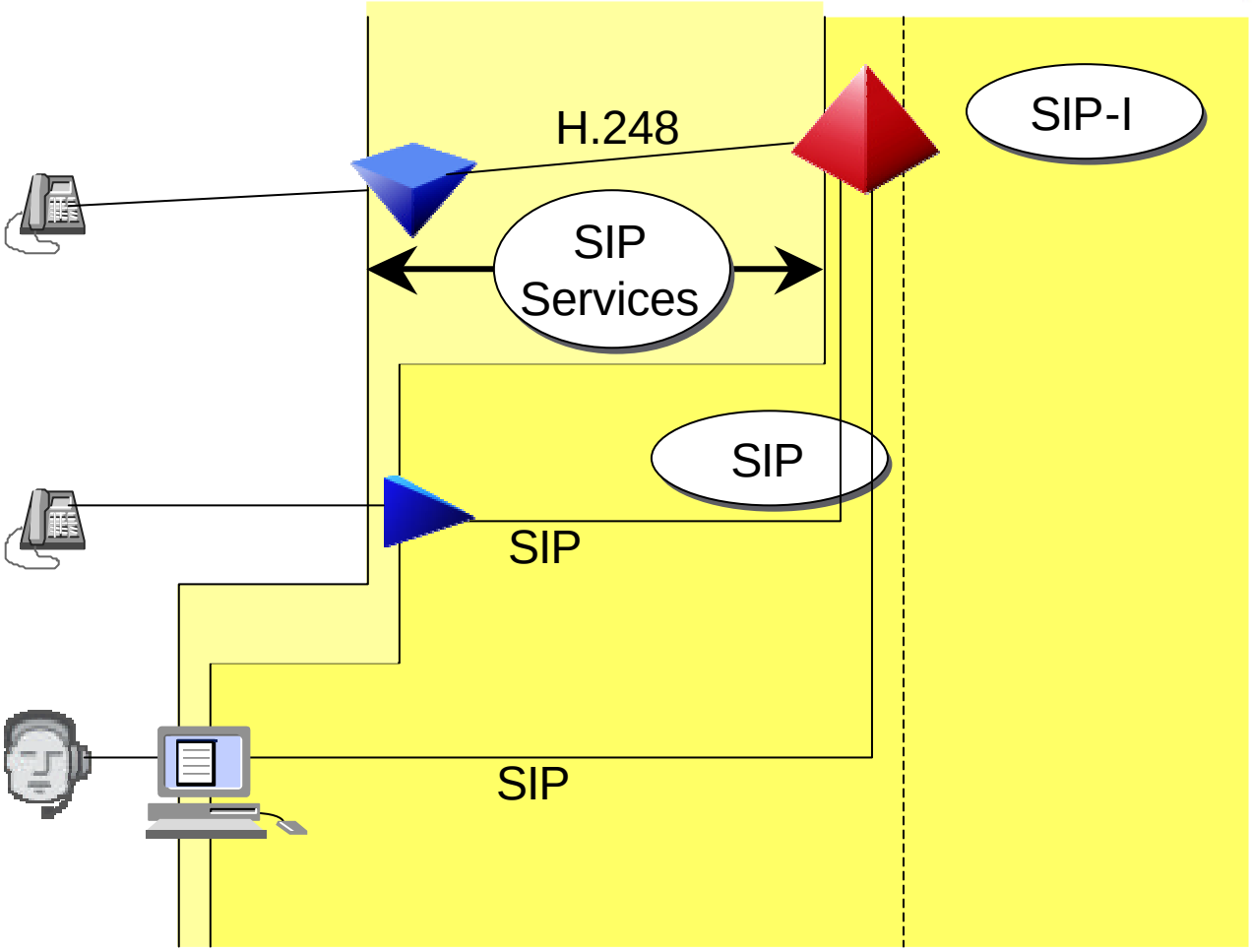
Government emergency telecommunications service

- Priority government calling in times of emergency crisis, or war

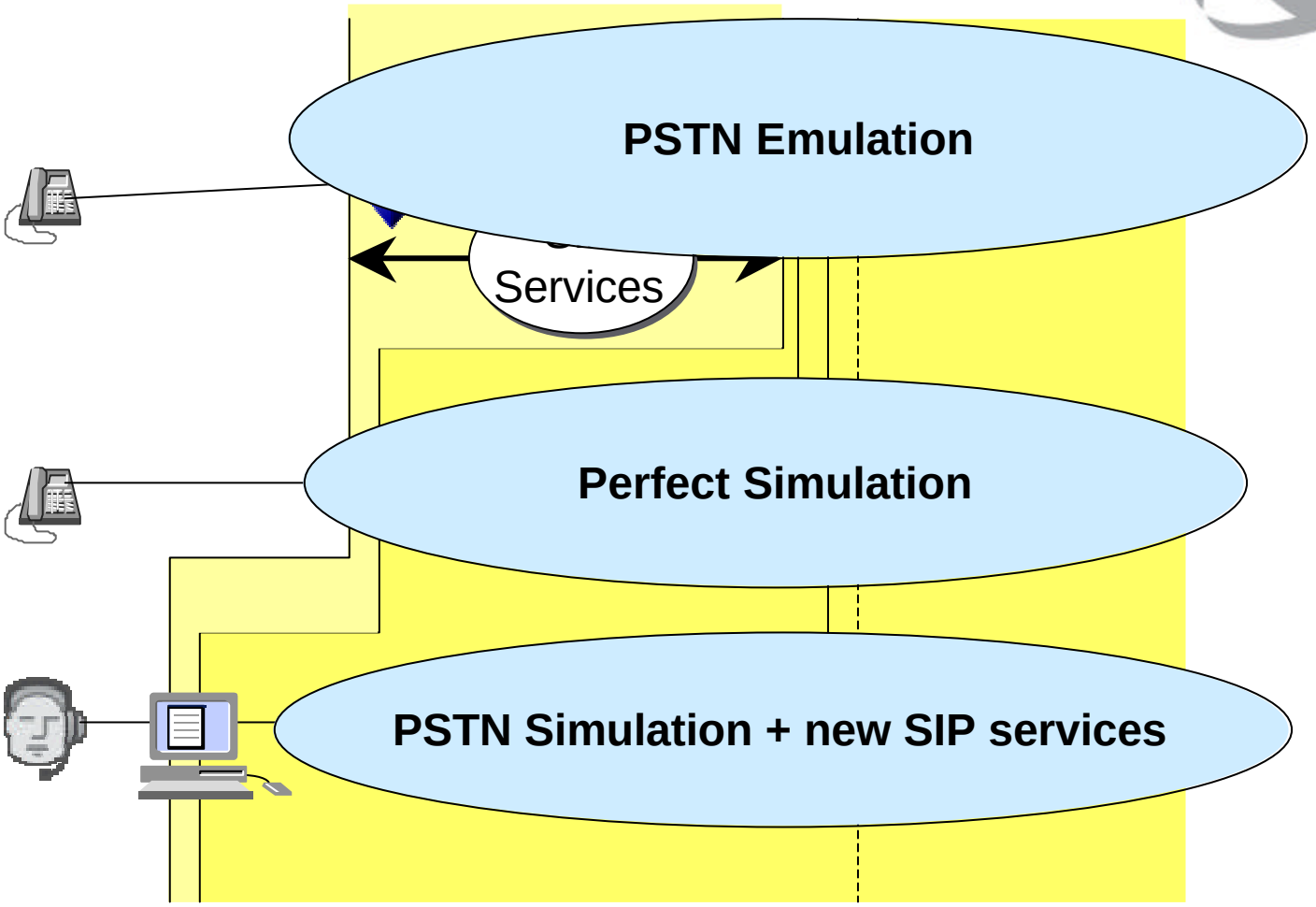
Emulation vs. Simulation



PSTN/ISDN evolution to SIP -1



PSTN/ISDN evolution to SIP -2



List of Acronyms

COLP	Connected Line Identification Presentation
COLR	Connected Line Identification Restriction
DSL	Digital Subscriber Line
DRM	Digital Rights Management
IAD	Integrated Access Device
IN	Intelligent Network
ISDN	Integrated Services Digital Network
ISUP	ISDN User Part
IXC	IntereXchange Carriers
LEC	Local Exchange Carrier
LNP	Local Number Portability
MCID	Malicious Call IDentification
MLPP	Multi-Level Precedence and Preemption
MTP	Message Transfer Part
OPEX	OPerating Expense
PSTN	Public Switched Telephone Network
QoS	Quality of Service
TDM	Time Division Multiplexing
VPN	Virtual Private Network

Thank you for your attention