



International Telecommunication Union

Migration to NGN

Chae Sub Lee

Vice Chairman of SG13

ETRI, Korea

ITU-T/ITU-D Workshop "Standardization and Development of Next Generation Networks"
Dar es Salaam, 3-5 October 2006



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1. Why need Evolution/Migration?
2. Ways for Evolution/Migration
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* Acknowledgement

Contents in this presentation mainly taken from previous ITU-T Workshop such as NGN events, ASTAP workshop, Jeju island workshop etc.



1. Why need Evolution/Migration?

NGN and Evolution

- NGN
 - Using packet infrastructure providing multimedia services
 - Telecom model
- Evolution
 - Continue support of traditional services
 - Smooth migration of network
- Evolution is operator specific
 - Network situations
 - Business considerations
 - Regulatory requirements



1. Why need Evolution/Migration?

Drivers of Network Evolution - 1

New revenue opportunities

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

Cost reduction

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



1. Why need Evolution/Migration?

Drivers of Network Evolution - 2

Management

- o Scalability
- o Billing

QoS & security

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



1. Why need Evolution/Migration?

Drivers of Network Evolution - 3

Ubiquity

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

Content

- o Digital Rights Management (DRM)
- o Conditional access

Network optimization

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



1. Why need Evolution/Migration?

Drivers of Network Evolution - 4

Interoperability

- o Interoperable equipments from all vendors

Multitude of access networks

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

Shared resources

- o Shared voice & data resources

Mixing of traditional and internet service

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



1. Why need Evolution/Migration?

Drivers of Network Evolution - 5

Interactivity

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

Storage

- o Business continuity
- o Data retention

Standards compliant

- o Implementing standards compliant devices
 - Standardized protocols and interfaces



2. Ways for Evolution/Migration

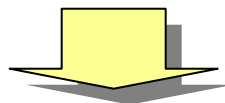
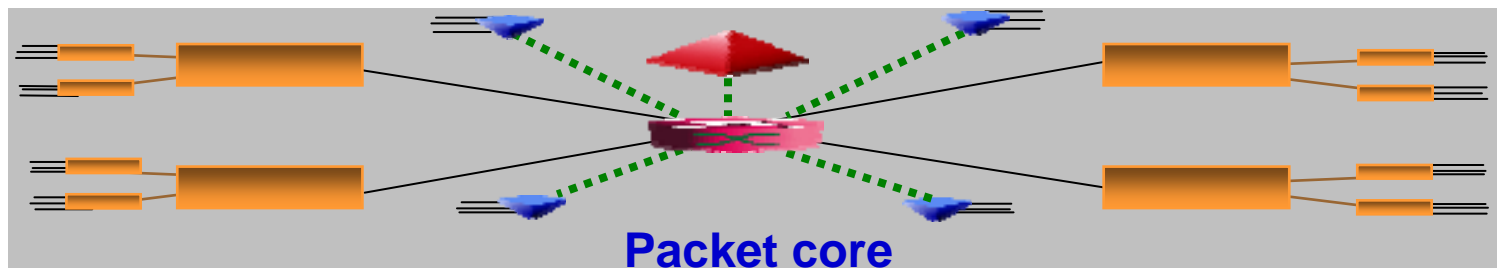
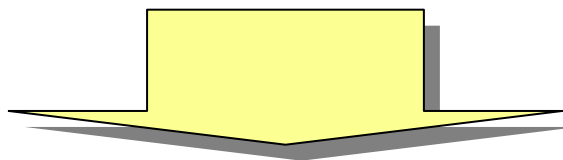
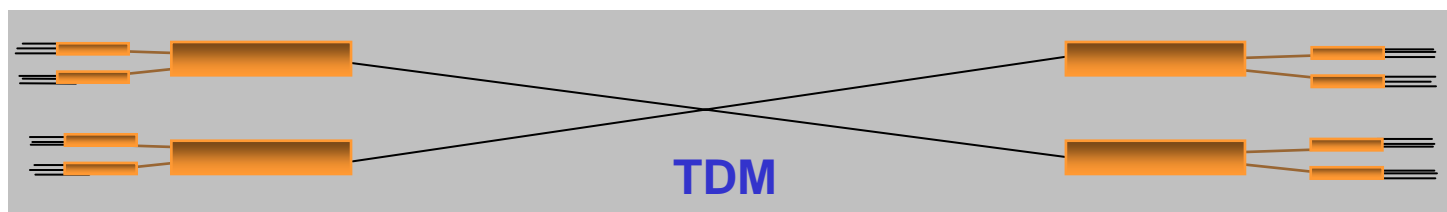
Generic Evolution Procedure

1. Provision of new communication services to broadband users in addition to existing network.
2. A significant portion of users switches to those services. Reduction of true PSTN / ISDN usage visible.
3. Cost of maintaining both systems in parallel becomes a factor. Decision to begin replacement of infrastructure.
4. Replacement of part of the infrastructure (e.g. local switch) by new infrastructure, without forcing all users to migrate.
5. Full change to new infrastructure.
6. Migrate remaining users to NGN.



2. Ways for Evolution/Migration

Network Evolution – PSTN/ISDN Transition Path

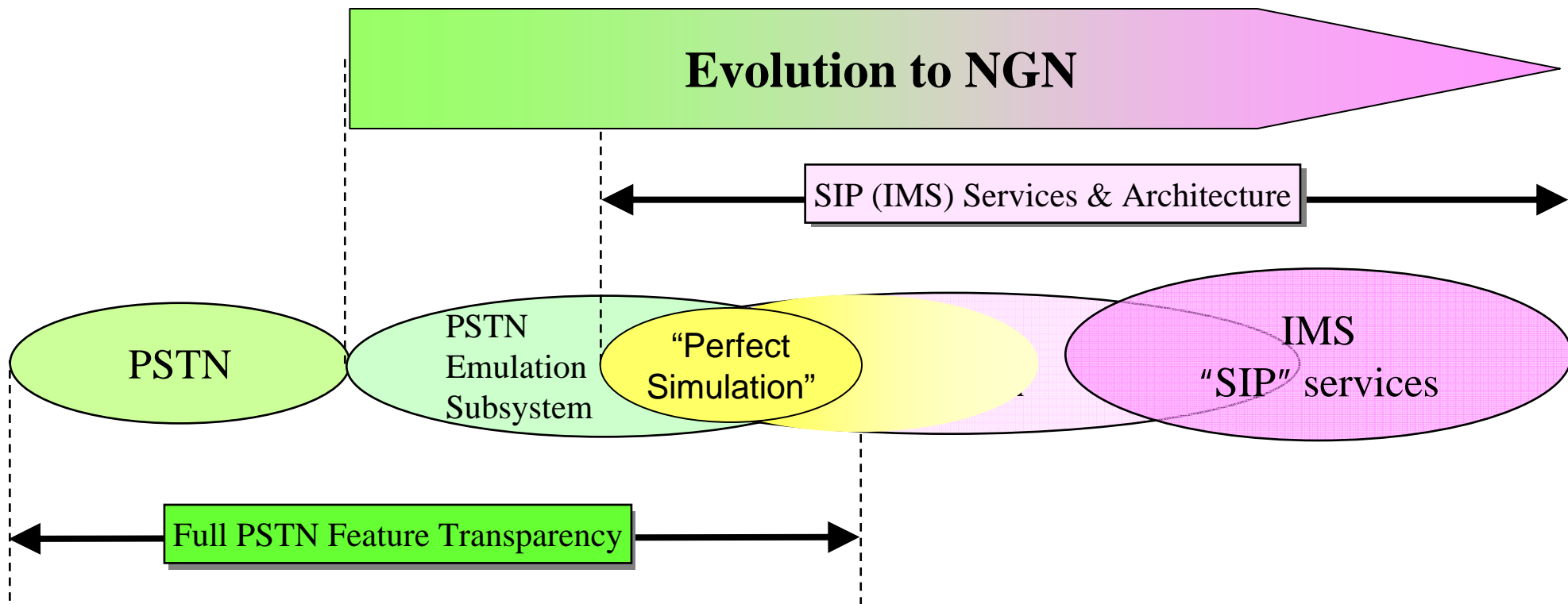


ALL IP



2. Ways for Evolution/Migration

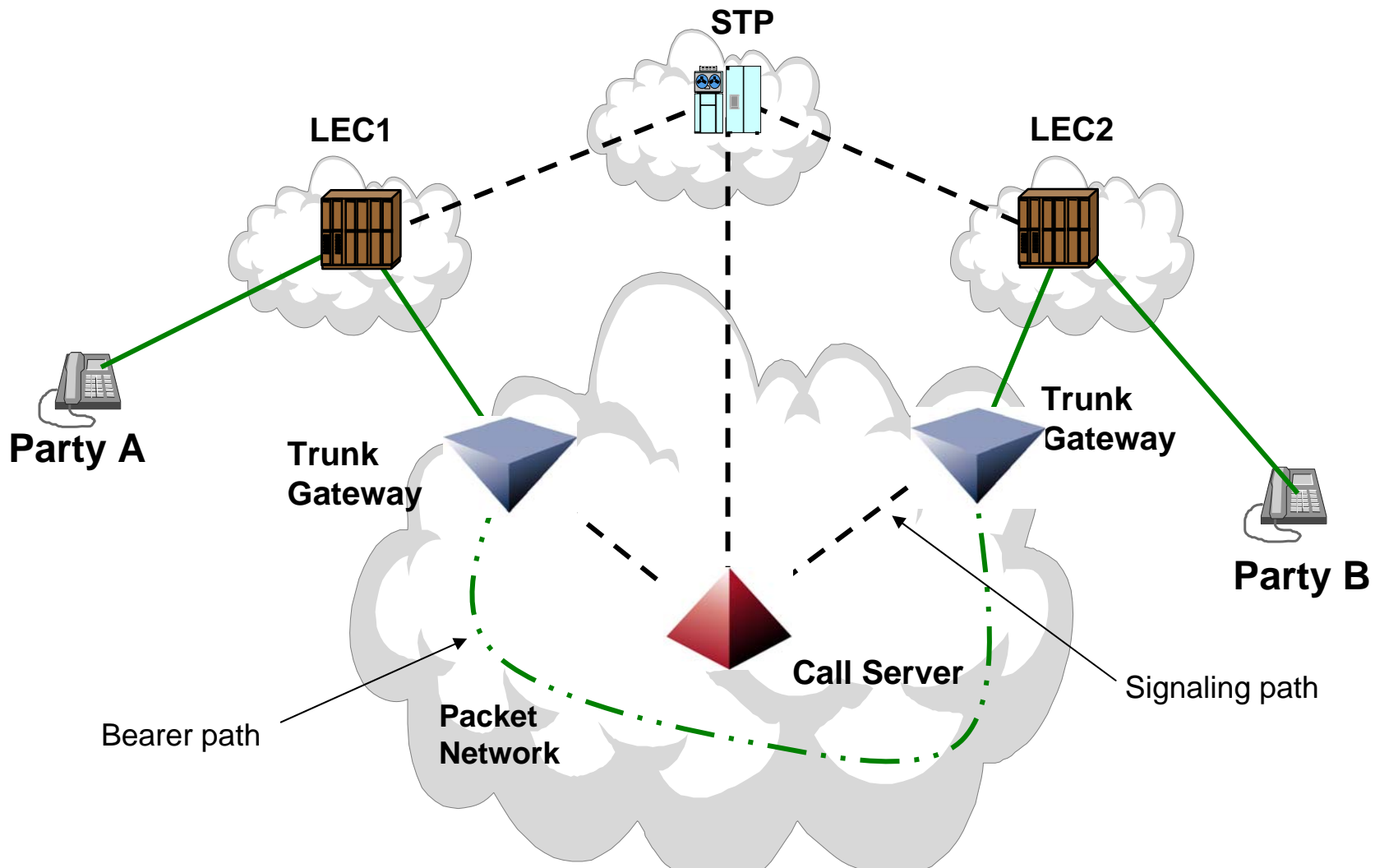
Emulation vs. Simulation





2. Ways for Evolution/Migration

Step-wise Evolution



Hybrid circuit and packet switched networks



3. Emulation for Evolution/Migration

PSTN/ISDN Emulation & Simulation

Emulation

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

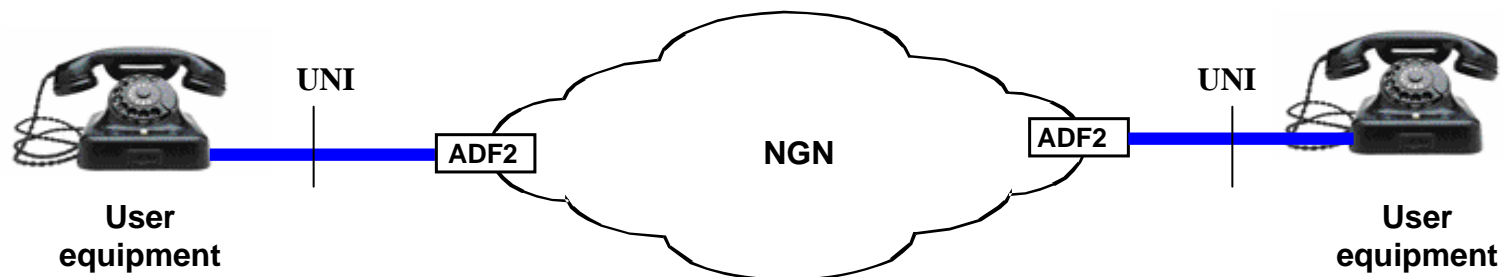
Simulation

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



3. Emulation for Evolution/Migration

Emulation scenario

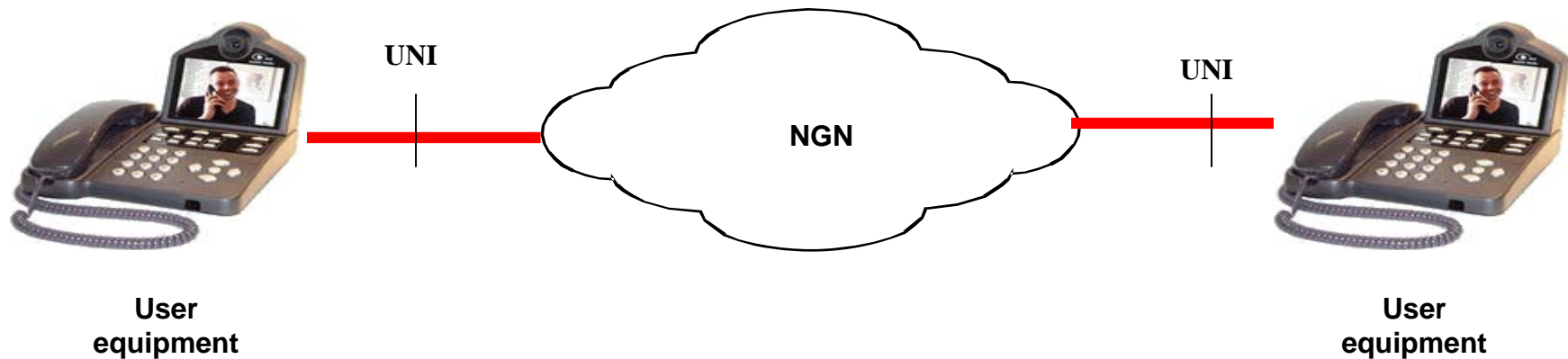


- o An encapsulation process
- o All services available to PSTN/ISDN users
- o User experience not changed by the network transformation



3. Emulation for Evolution/Migration

Simulation scenarios - 1

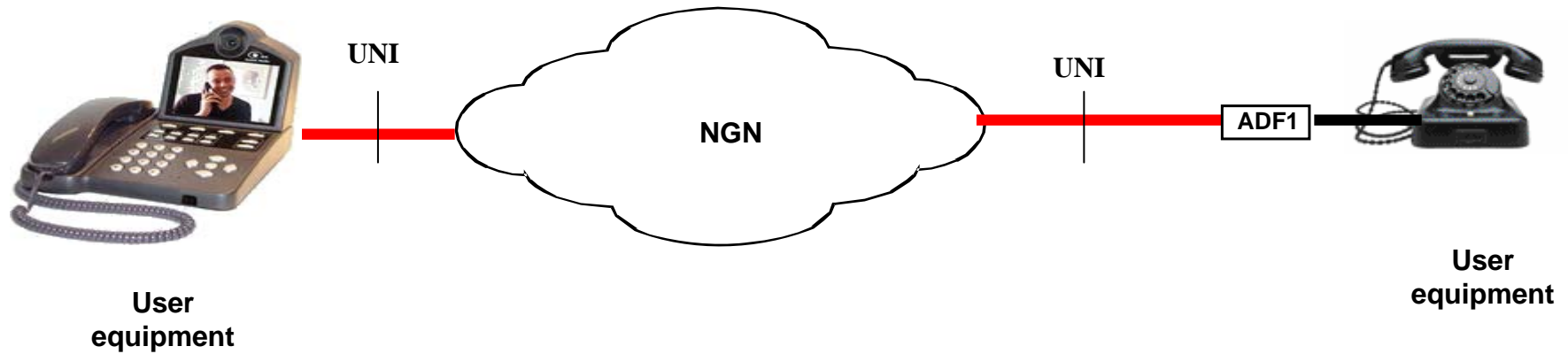


- PSTN/ISDN-like services available
- Availability of possible new services
- User experience is changed by the network transformation



3. Emulation for Evolution/Migration

Simulation scenarios - 2

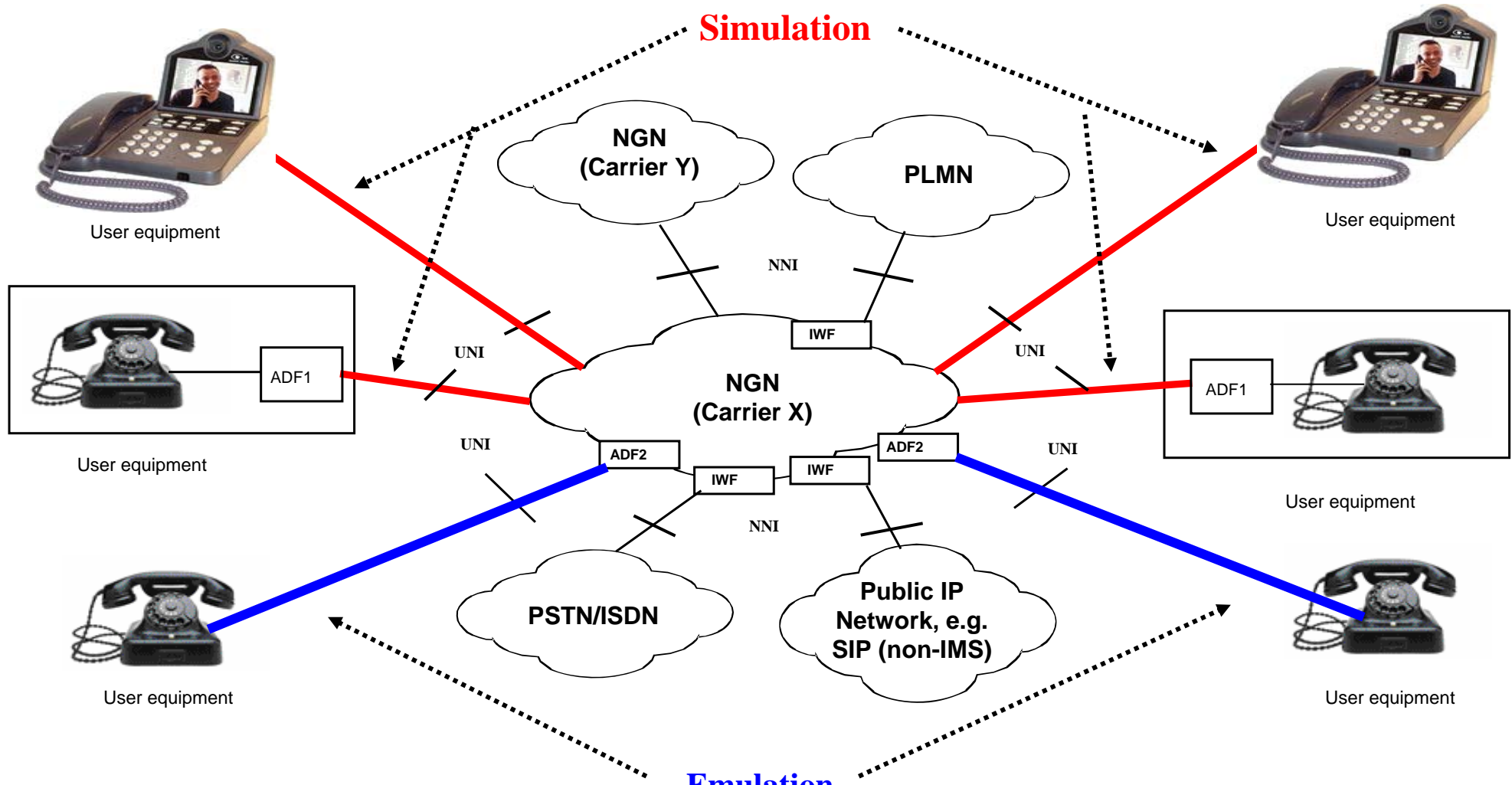


- Only PSTN/ISDN-like services available
- New experience for legacy terminal users



3. Emulation for Evolution/Migration

General architecture



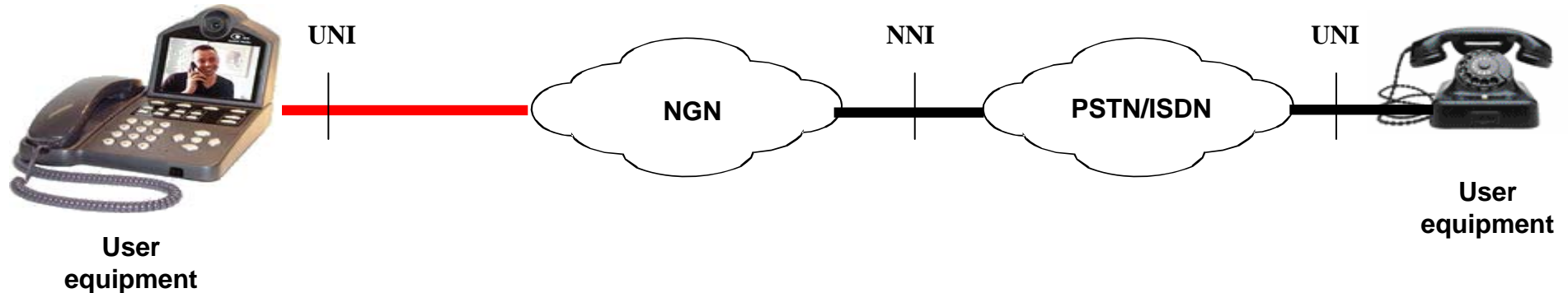
UNI = User Network Interface = IF1
 NNI = Network Node Interface = IF2

ADF= Adaptation Function
 IWF=Interworking Function



3. Emulation for Evolution/Migration

Emulation, simulation & interworking - 1

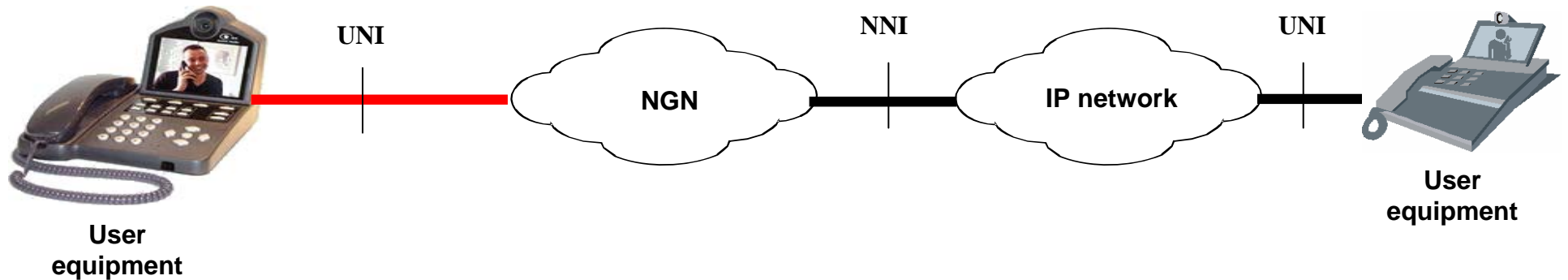


- o Service interworking between NGN and PSTN/ISDN is required
- o Only PSTN/ISDN-like services available
- o Legacy terminal user experience cannot be fulfilled for end-to-end connection



3. Emulation for Evolution/Migration

Emulation, simulation & interworking - 2

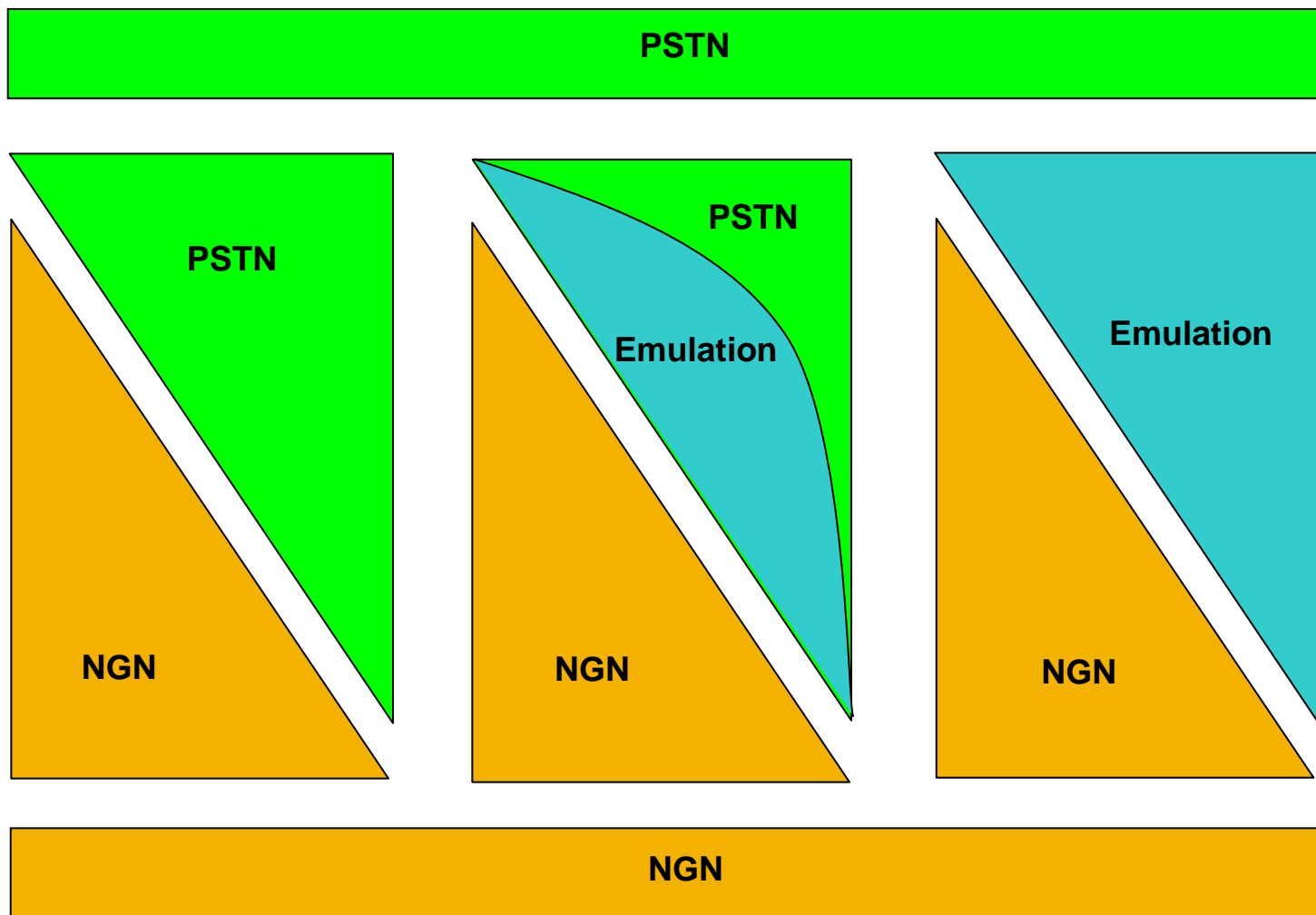


- Service interworking between NGN and IP network is required
- Both the NGN and IP network user experiences may not be fulfilled for end-to-end connection



3. Emulation for Evolution/Migration

General Evolution Scenarios





3. Emulation for Evolution/Migration

General Evolution Scenarios – Overlay Network

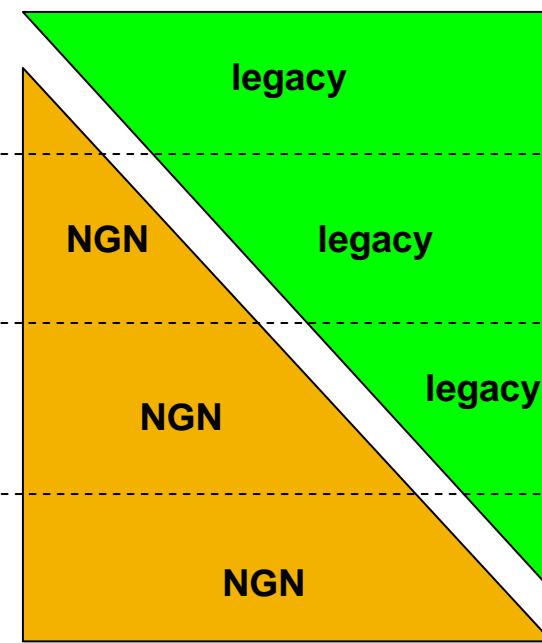
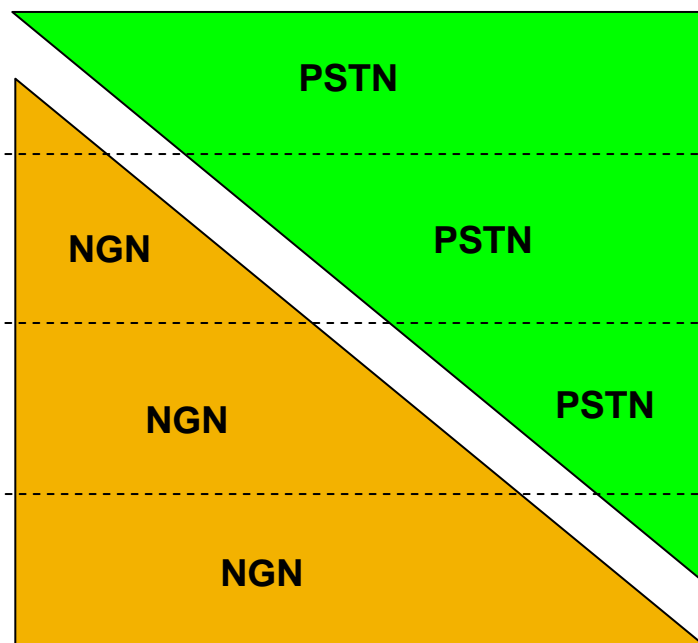
Infrastructure

Users

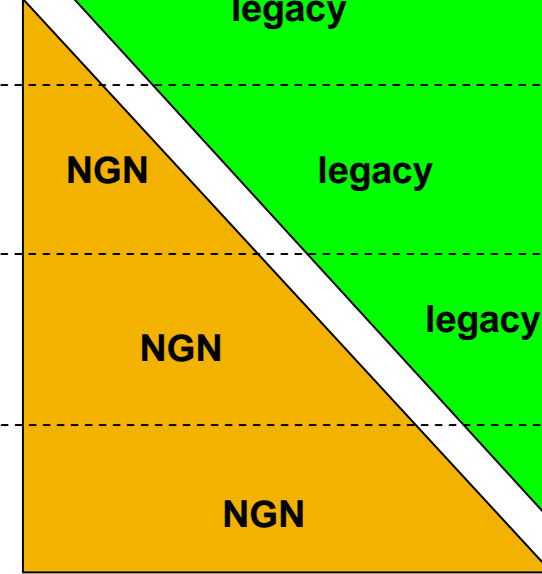
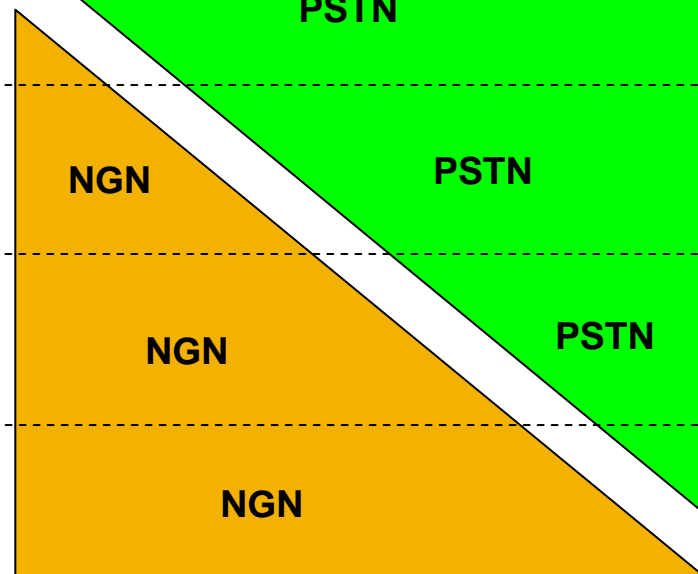
① Starting point



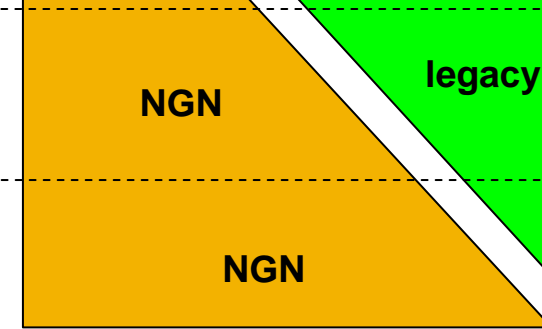
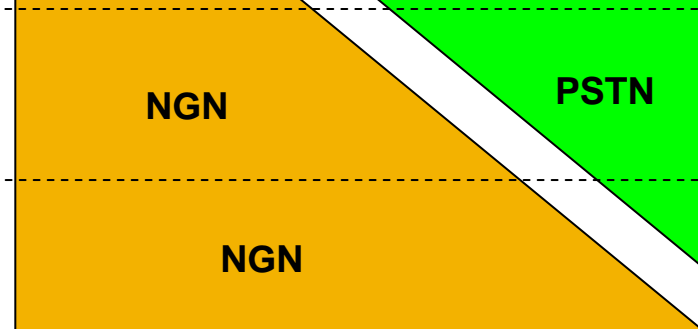
② Overlay NGN structure



③ Expansion of NGN usage



④ Replacement of remaining infrastructure



⑤ Integration of legacy users



⑥ Final stage



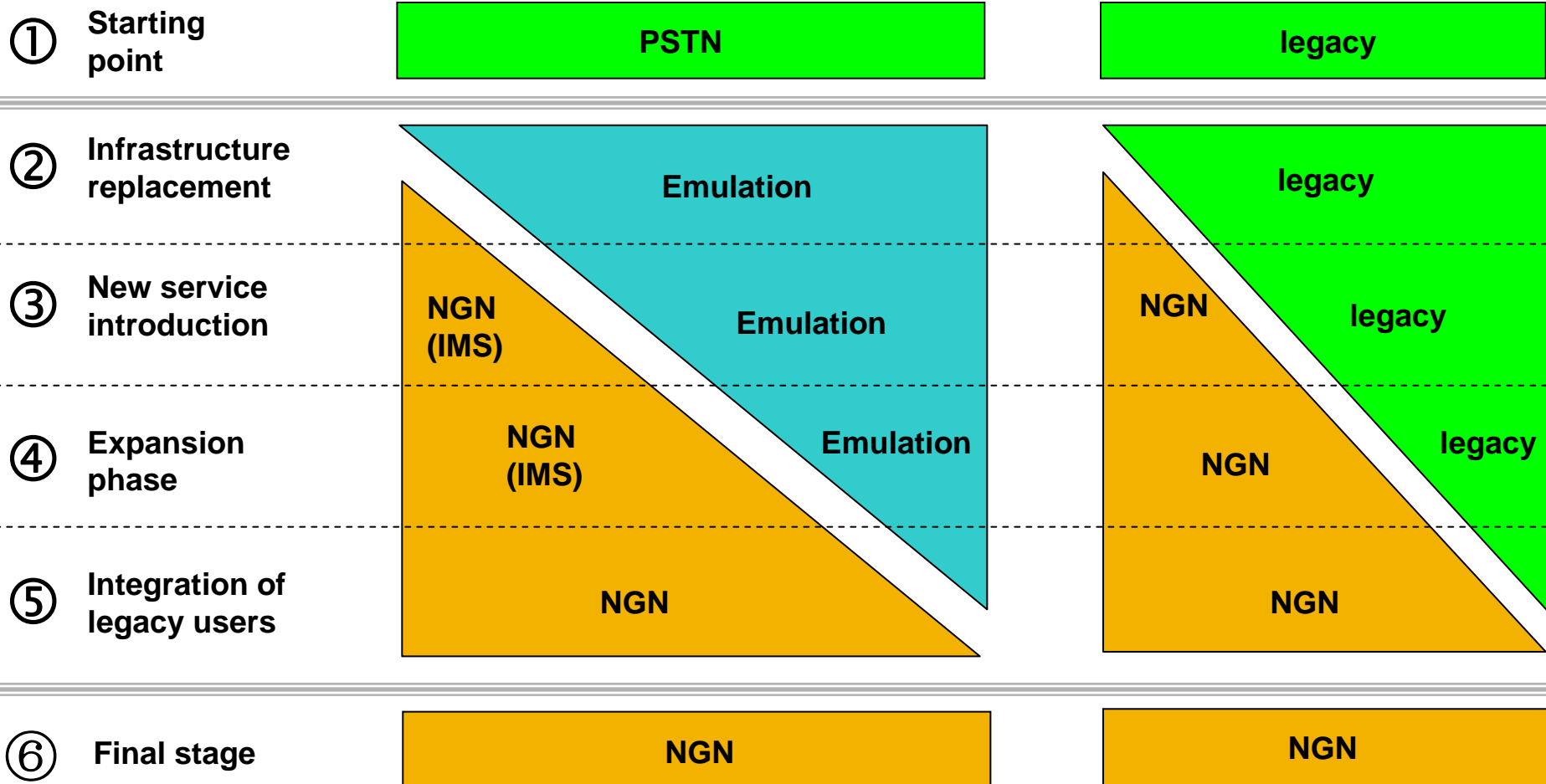


3. Emulation for Evolution/Migration

General Evolution Scenarios – Infrastructure Replacement

Infrastructure

Users



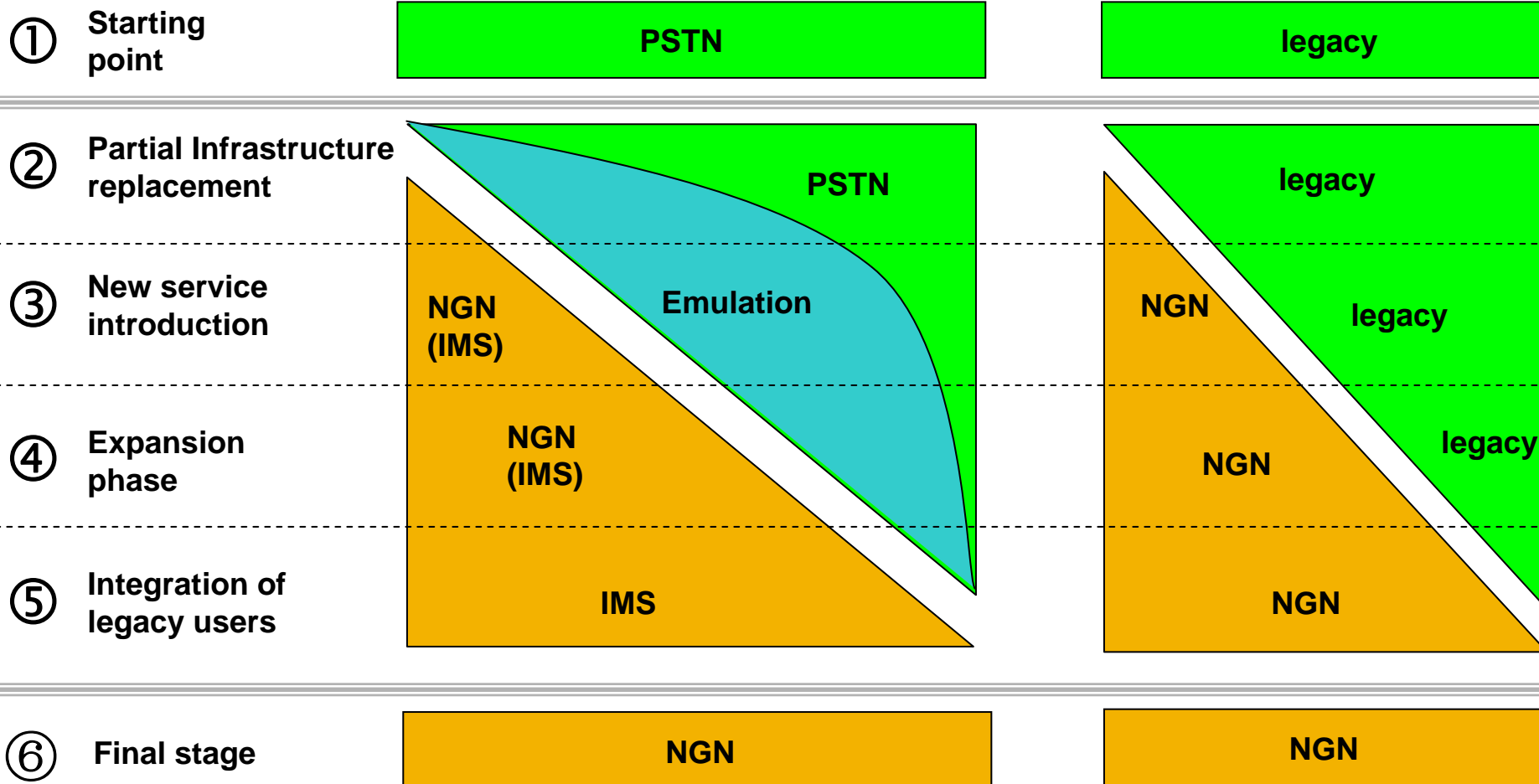


3. Emulation for Evolution/Migration

General Evolution Scenarios – Mixed

Infrastructure

Users

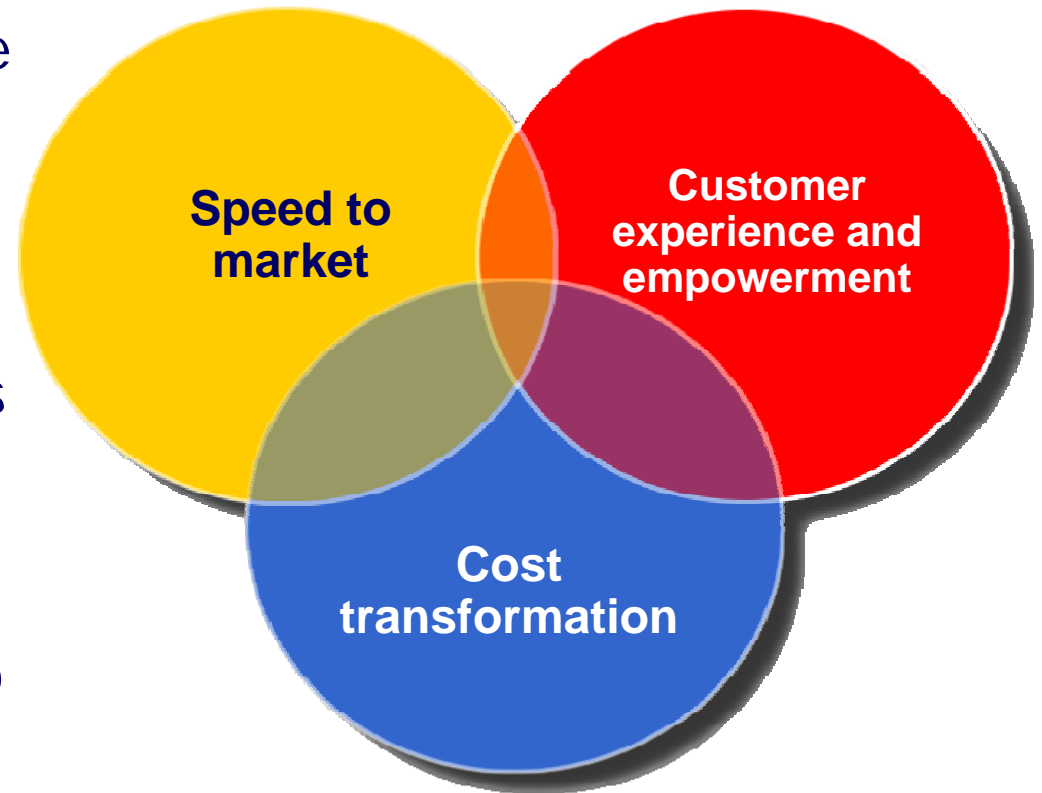




4. Case Study - 21CN

21CN - three key objectives

- o Empower the customer with control, choice and flexibility like never before including communications from anywhere to any device
- o Offer exciting new services for customers faster than before
- o Reduce costs - expected to amount to £1 billion (\$1.8bn) per annum by 2008/9





4. Case Study - 21CN

Drivers for 21CN

- o Convergence
 - Fixed / Mobile
 - Service (work, home, business, bundles)
 - Computing / Telecoms
 - Voice / Data
 - Intelligence and OSS

- o Pressure on traditional revenues causes Telco's to diversify
 - ICT
 - Mobile
 - IPTV

- o The internet leads to service and pricing expectations in the users mind (online, immediate, anywhere, free)
- o Pent up demand for increasing broadband speed
- o Aggressive regulation and competition



4. Case Study - 21CN

21CN – it's big and bold

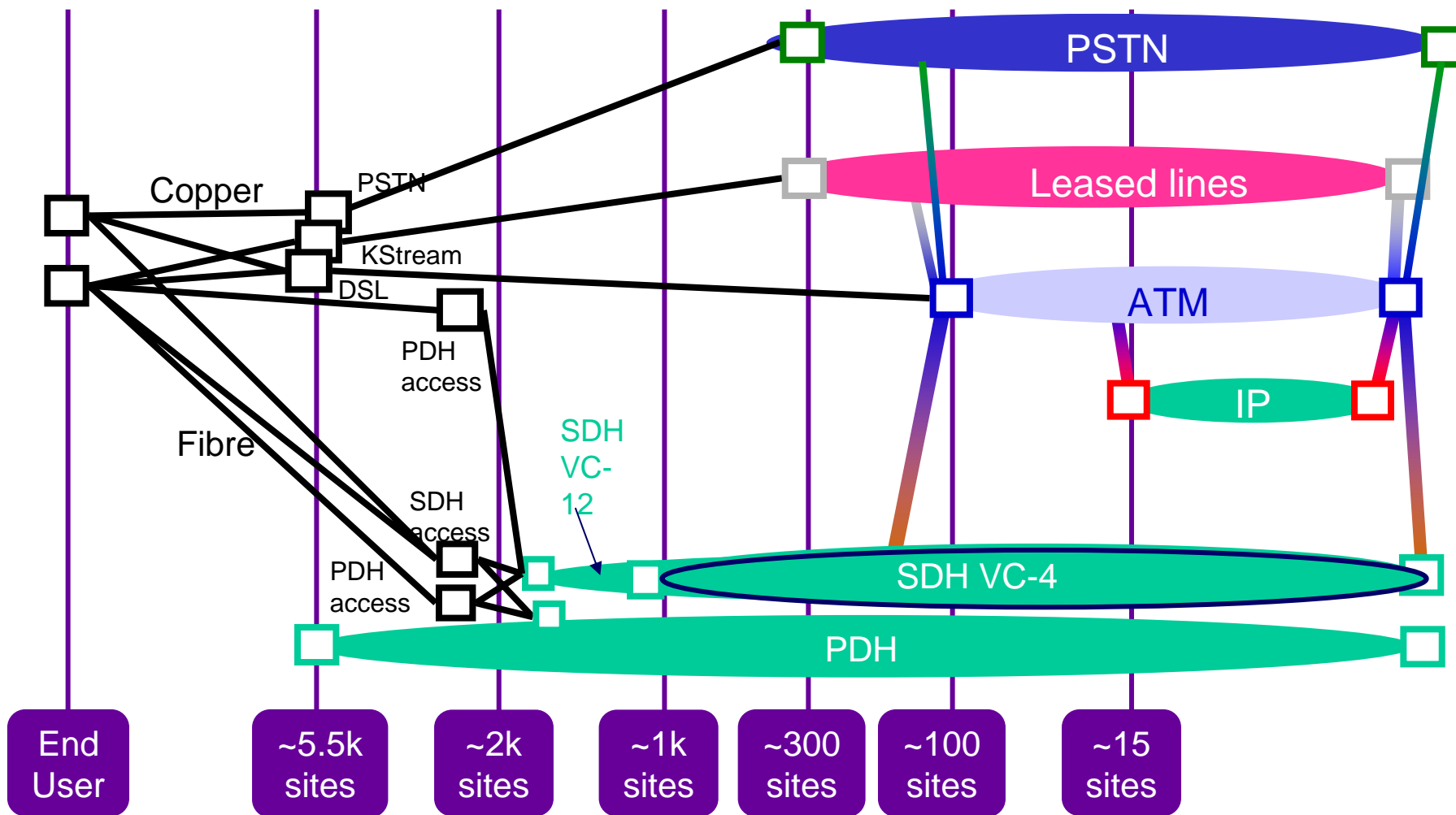


- Not simply network transformation - but a radical overhaul of products, systems, process ... of BT's business
- Bigger annual investment than is spent on UK's motorways and trunk roads
- A world first for a telecommunications company



4. Case Study - 21CN

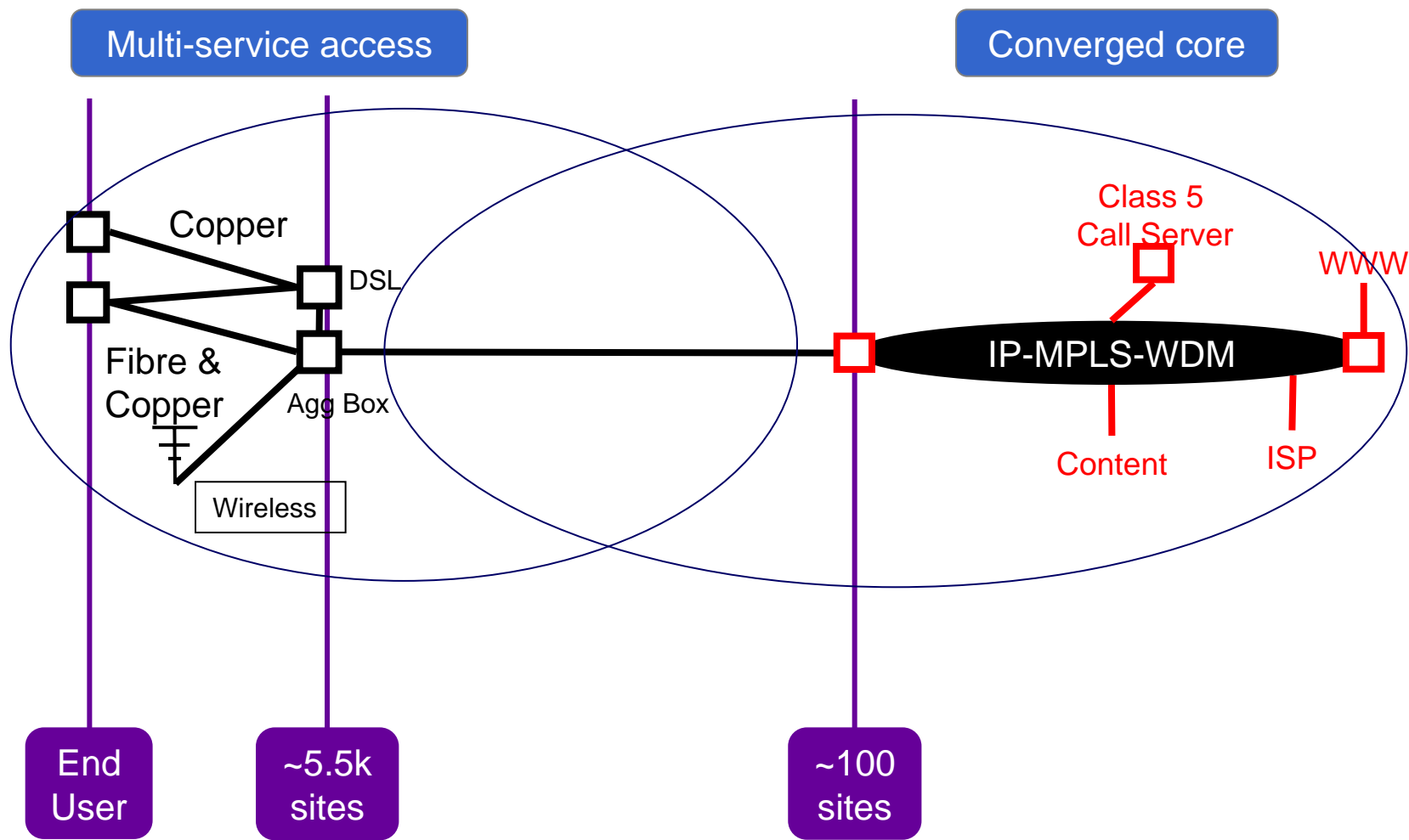
21CN - our current UK network





4. Case Study - 21CN

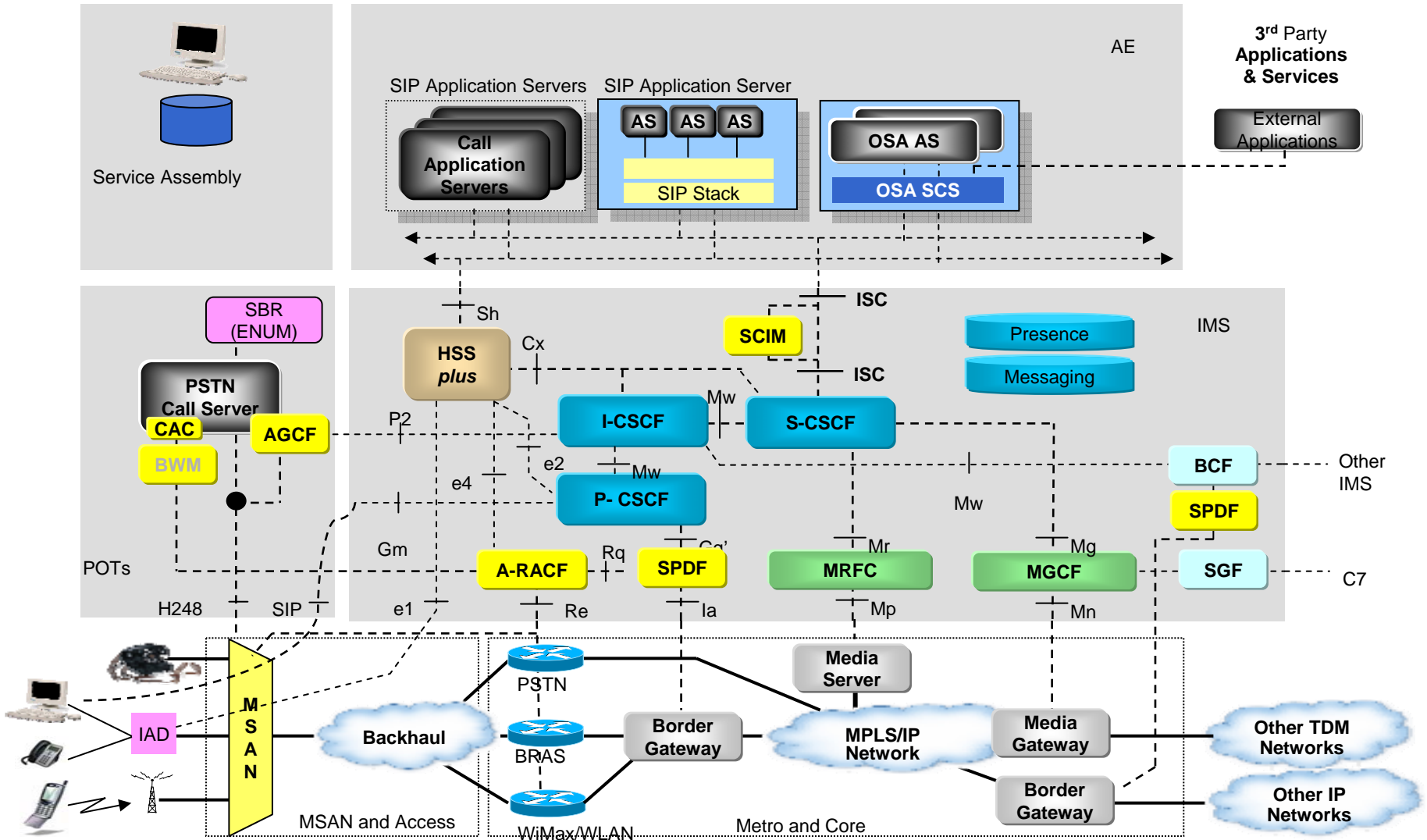
21CN - our simplified UK network





4. Case Study - 21CN

BT's 21CN architecture

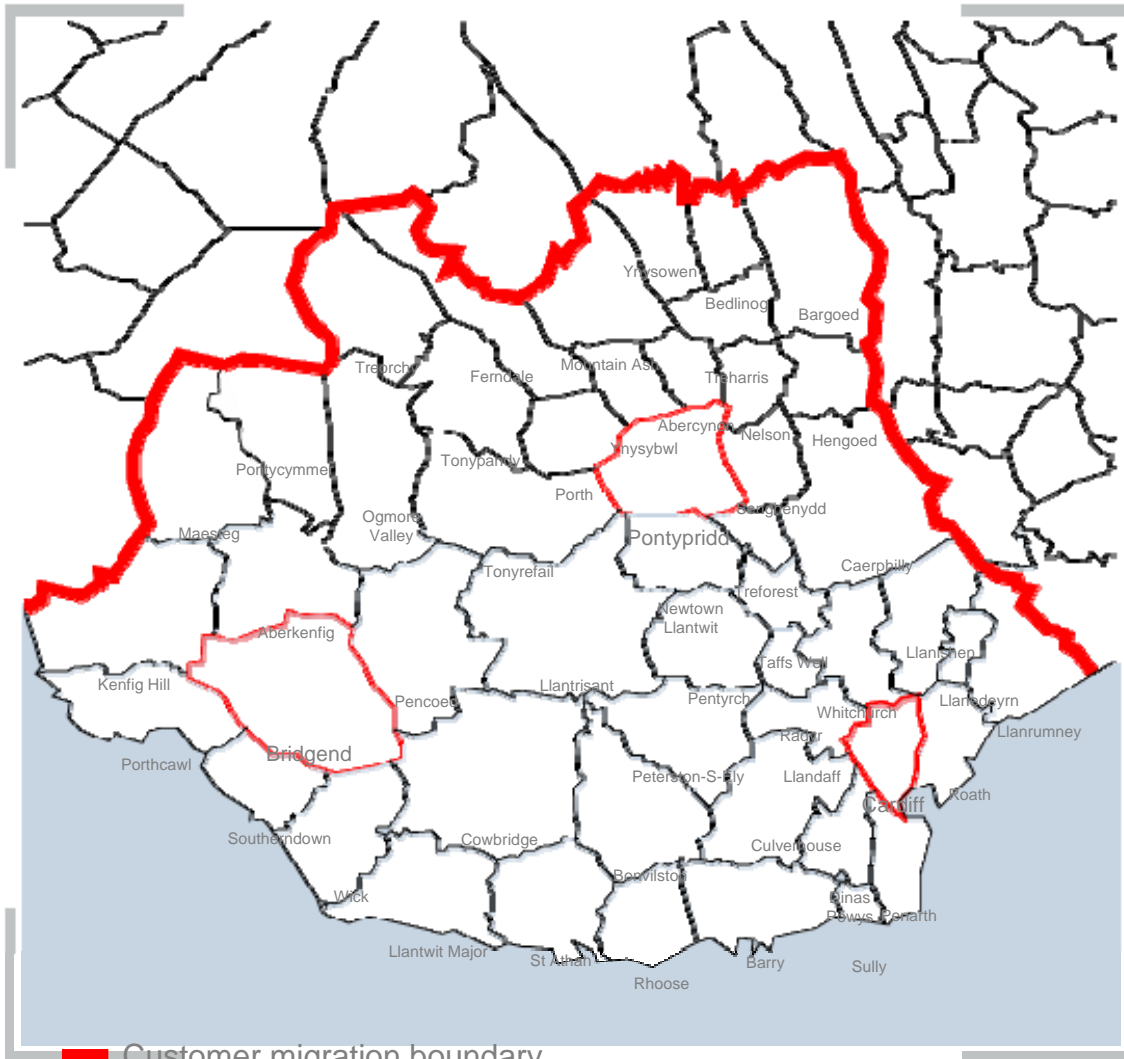


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4. Case Study - 21CN

Early migration to 21CN planned for South Wales



- Migration of 350,000 customer lines expected to begin later in 2006
- Removal of 9 digital local exchanges
- Installation of 21CN equipment and capabilities
- Region chosen because of local and industry demographics
- Mass migration in UK will require 150,000 lines per week over 4 years to enable 30M lines



4. Case Study - 21CN

Early migration to NGN

- Huge logistic and technical challenges
- Full 21CN capability set not possible on day 1
- Timely downstreaming of key standards is a critical issue, requiring
 - Alignment with strategic suppliers
 - Working with other Telcos
 - Key inputs to ITU-T, ETSI and ATIS standards



Thank you for
your attention !!!