



## PSTN network consolidation based on NGN technology



ITU/ITC Regional Seminar on Network Evolution to Next Generation Networks and Fixed Mobile Convergence for CEE, CIS and Baltic States

Moscow (Russia), 27-30 April 2004



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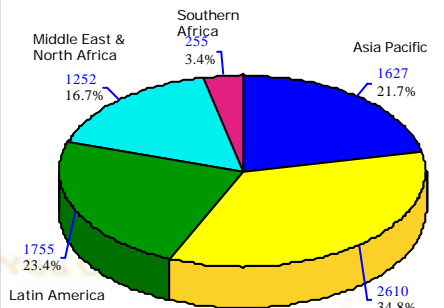
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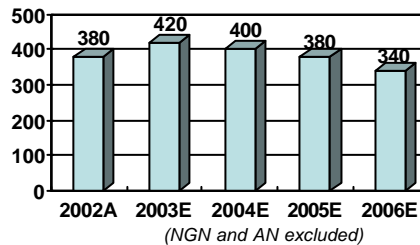
## PSTN Consolidation based on NGN

- By 2006, PSTN optimization market size ~ 75 Million lines (Analog switch + weak-brand switch) N.America, W. Europe, Japan excluded.
- Estimated 8~12 Million lines per year for NGN to optimize fixed network



Source: Dittberner Associates Inc. ©2003

### Analog & Weak-Brand Replacement Market Size (US\$m)



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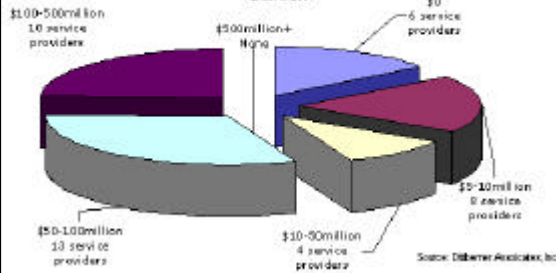
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## Global NGN Market Overview

### Range of Budget Planned for NGN (Softswitches & Media Gateways) in 2004

Source: Interviews with 47 Carrier Operators by NGNWorld in February to March 2004



Source: Dittberner Associates, Inc.

- The NGN Market is forecasted to exceed US\$2 Billion in 2004
- Reduced Operational Costs identified as major value driver for NGN adoption
- Broadband Services, VoDSL, Hot-Spot and Triple Play are most attractive services



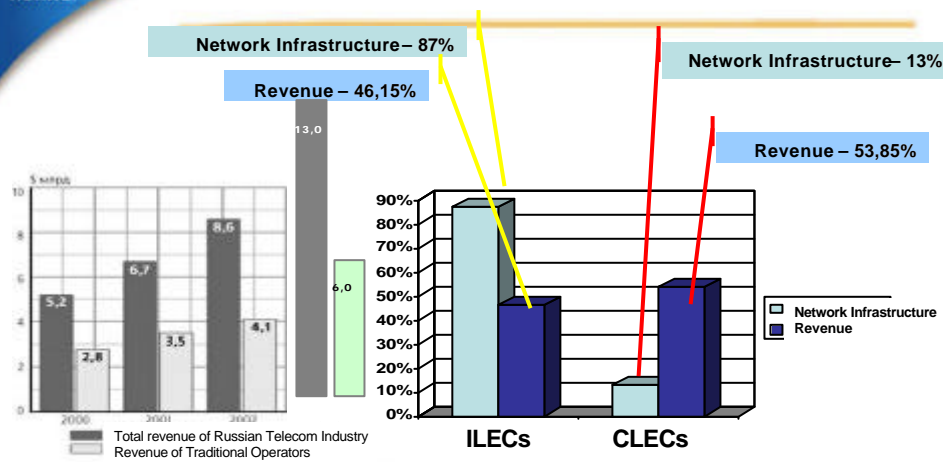
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## Trends in Russian telecom Industry



Source: "Russian Telecom Network Development Concept" by Telecom Ministry of Russia

### Challenge for ILECs:

- ✓ Reduce OPEX & CAPEX
- ✓ Increase revenue.



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## Business Rationale for Network Migration

- DAI developed several models to assess the economic benefits of NGN deployment
- Although there is no “one-fit-all” approach the following results can be realistically achieved:
  - Up to 40% Reduction in OPEX and CAPEX (results vary and are influenced by traffic trend and network evolution, ownership of the transmission networks, etc..)
    - OPEX savings: Lower Site, Maintenance & Operational expenses
    - CAPEX savings: Avoided TDM upgrades
  - 20% Savings from Eliminating Tandem Exchanges
    - 50% to 70% fewer trunks
  - 40% Reduction in Energy Consumption
  - Up to 80% Reduction in Space Requirements
- Up to 70% Reduction in transmission bandwidth in backbone network



Source: Dittberner Associates Inc. ©2003

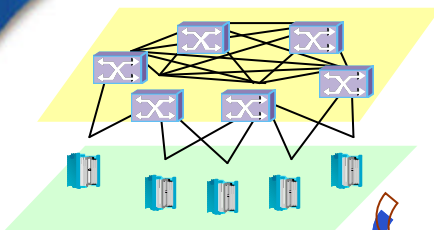
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## Rome is not built in one day



### Issue ---- Protect existing resource

Whole network migration cost is high, how to protect existing resource?

### Issue ---- IP network development

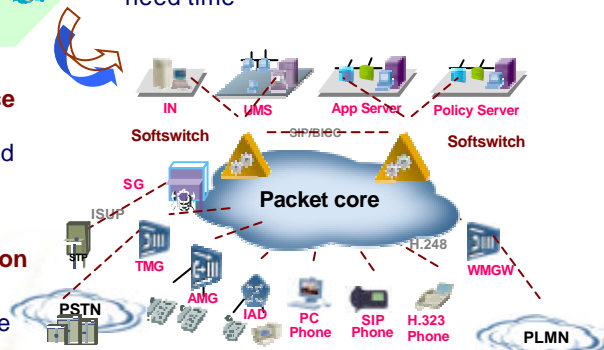
IP network need to cover access layer, it still need time

### Issue ---- O&M Experience

IP address assignment, numbering scheme..., need time to accumulate the experience.

### Issue --- Service Promotion

New service and business model need time to explore



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## Not enough for current IP network

	Internet	Telecom
Service	<b>Internet Service</b> •Compromising QoS is better than denial of service	<b>Telecom Service</b> •Denial of service is better than compromising QoS
Network	<b>IP Network</b> •Best Effort Connectionless	<b>Telecom Network</b> •Quality guaranteed by connection oriented

- Services define networks
- Current IP network lacks the features essential in supporting carrier-class services

## Summary

- Migration from a TDM-based public switched telephone network (PSTN) to a packet-based next generation network (NGN) is inevitable!
- Major Reasons to evolve
  - Ability to introduce new services, multimedia applications
  - DSL access penetration
  - Lower cost of ownership: unified network instead of separate networks
- IP is becoming the universal protocol used to provide most new services
- Economic Analysis of PSTN Migration to NGN indicates a Pay-Back of 2-3 years after the deployment is complete and an impressive reduction of OPEX
- Successful NGN implementations exist to date

## Summary

➤ **No One-step solution**

Migration from a fully TDM-based PSTN to a packet-based next generation network (NGN) cannot be achieved in one step!

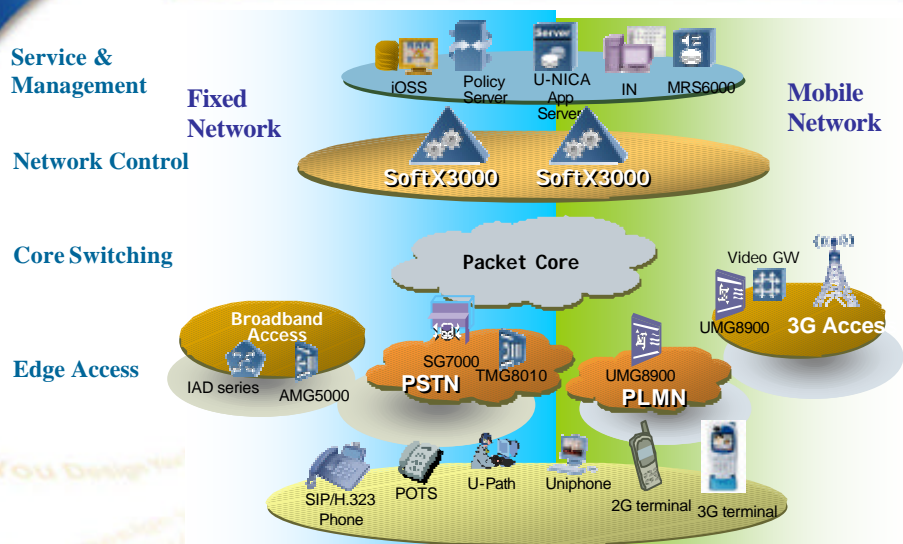
➤ **No One-fit-all Approach**

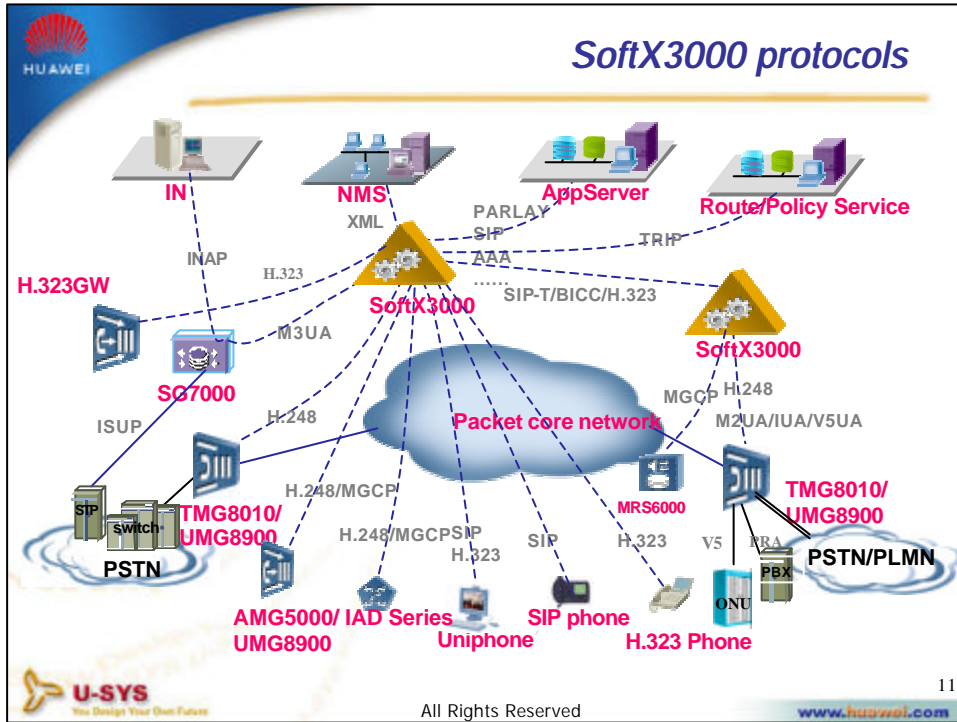
For NGN migration and operation, although the objective network is similar, there is no “one-fit-all” approach, the operator has to decide the mode according to its own requirement for development and competition.

➤ **ILEC & CLEC**

ILEC goes to NGN to optimize network, increase service revenue and reduce cost; CLEC takes NGN as a cost effective and future oriented solution to compete with ILEC.

## U-SYS Network Architecture





**U-SYS Network Components**

	iOSS	Integrated operations support system
	U-NICA AppServer	Application server
	MRS6000	Media resource server
	Policy Server	Policy server
<hr/>		
	SoftX3000	SoftSwitch
<hr/>		
	SG7000	Signaling gateway
	TMG8010	Trunk media gateway
	UMG8900	Universal media gateway
	AMG5000 series	Access media gateway
	IAD series	Integrated access device
<hr/>		
	WorkSpace	Unified Communication Platform
	OpenEye	Multimedia client terminal software

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## Unique and Practical Universal Media Gateway

UMG8900 (Universal Media Gateway) can act as:

- TDM switch (Tandem/LE)
- TG (Trunk Media Gateway)
- AG (Access Media Gateway)
- 3G Access Media Gateway
- VIG (3G Video Interworking Gateway)
- Integrated Gateway

*Universal Flexible!*



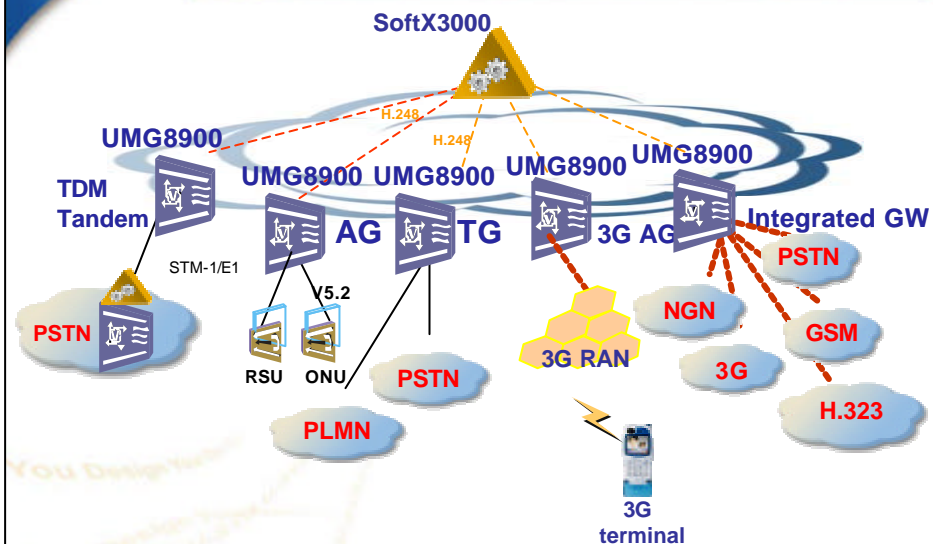
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## Unique Universal Media Gateway

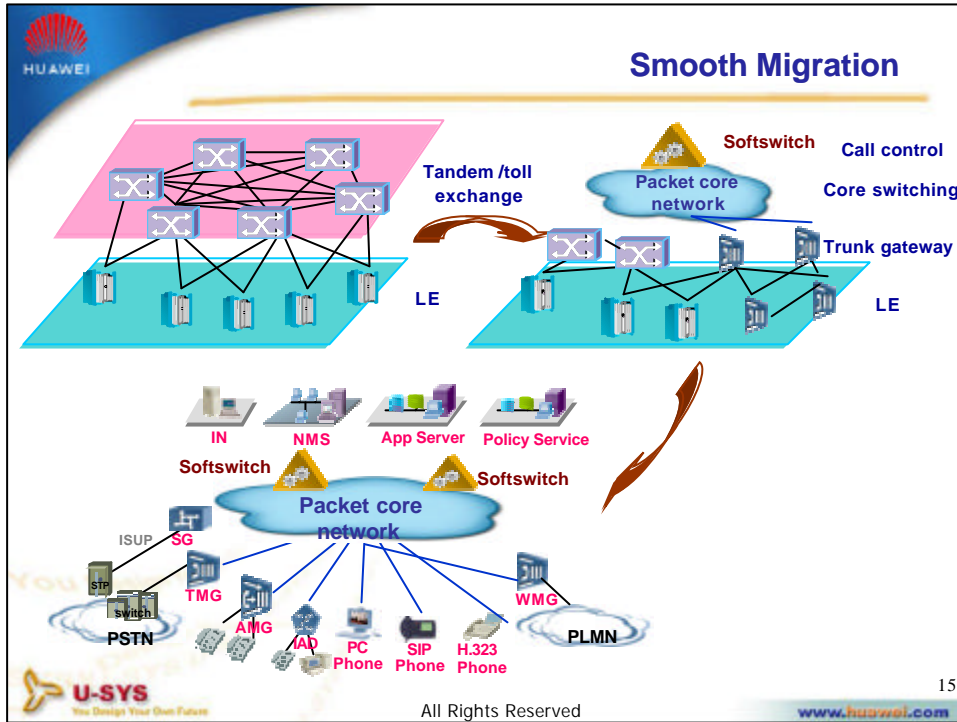


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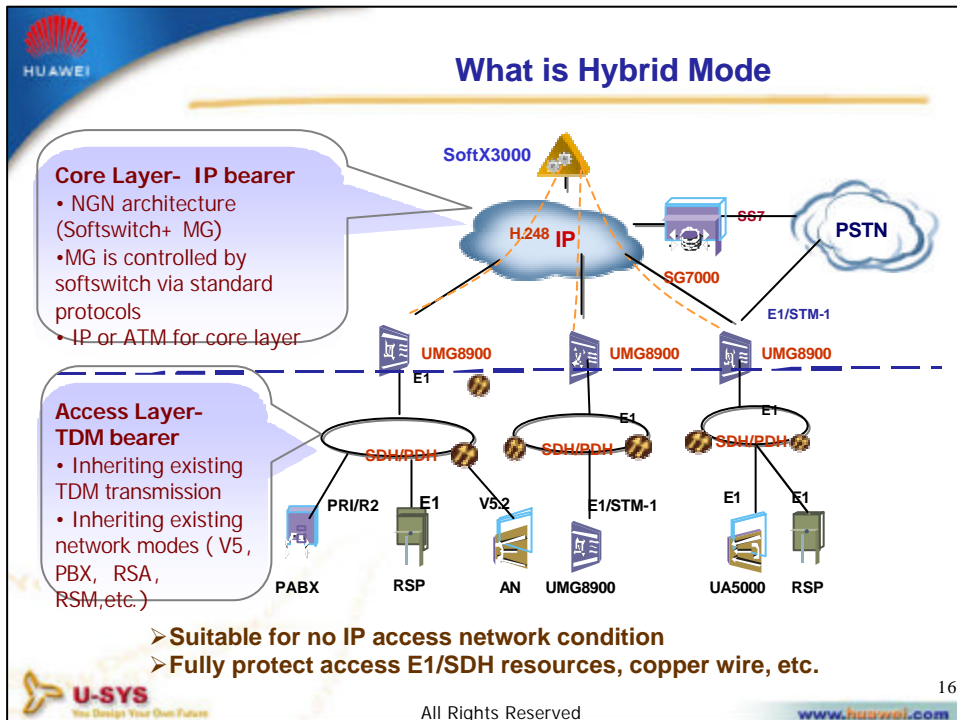
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## Hybrid Mode Solution Advantages

### ◆ At Core Layer

- Dedicated IP core, guarantee QoS and security
- Universal MGW, support TDM switching, simplify network structure
- With Softswitch to enable VAS introduction
- Smooth migration with standard NGN architecture

### ◆ At access Layer

- Inherit all the access layer infrastructure, save launch investment
- Do not interfere with the existing service
- Flexible and easy deployment
- Inherit TDM high voice quality



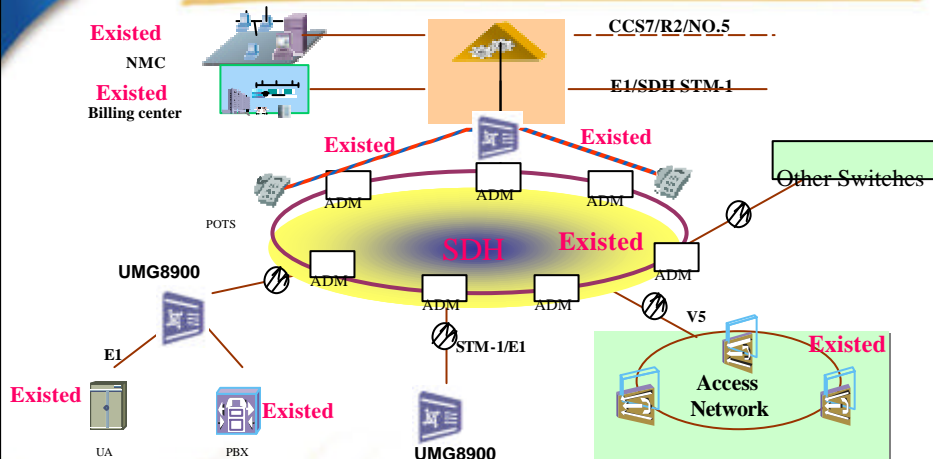
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## What is NGN over TDM mode



- **Function as a traditional exchange, but with NGN capability**
- Suitable for no IP/ATM network resource condition
- Fully protect E1/SDH resources, access network, O&M resources
- Fully use existed machine room, power, copper cable resources



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## NGN over TDM Solution Advantages

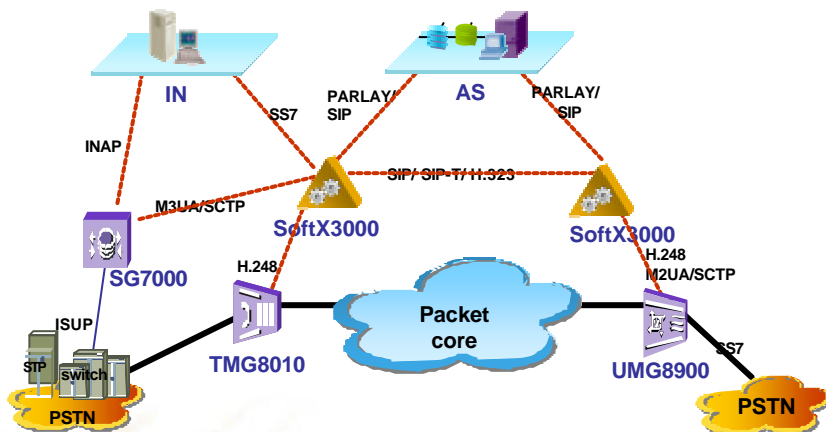
### ➤ Backward compatibility

- Ensure voice quality & security
- Inheriting PSTN networking modes, e.g. RSU, AN, etc
- Inheriting existing PSTN services and VAS, IN services, etc.
- Fully utilizing current transmission to protect investment
- Low impact to existing network and keep current OA&M structure

### ➤ Forward compatibility – NGN Ready

- Deploying standard NGN architecture
- Strong service provisioning, e.g. IP Centrex, UC, etc.
- High integration, unified NMS and centralized billing.

## U-SYS Class 4 Solution





## Advantages of U-SYS C4 Solution

- **Simple network with flat structure**
  - TDM/IP integrated solution
  - Large capacity with high integration
  - Easy expansion
  - Less Backbone transmission
  - Fully using the IP bandwidth
- **Multi Service provision with Triple Play**
  - Voice, data, video in one
- **NGN backbone ready for whole network Migration**
  - Mature technology for long distance VoIP
  - Easy operation for C4
  - Less impact to existing network
  - Ready for cross area operation



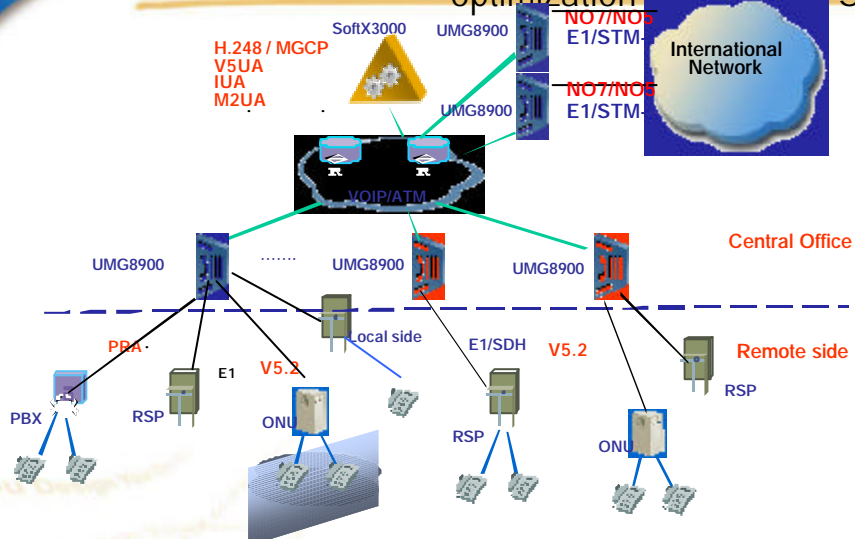
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## Case study: Brunei Telecom network optimization based on U-SYS



Nationwide NGN network construction (140 000 ports)



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**Case study: China Satellite VoIP nationwide network commercial application**

- Phases 1, 2
- Phases 3
- MGs in 150 cities of China
- Support 6,000,000 VoIP PPS users

- International VoIP
- IN services,
- Multimedia services, NG-IN

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**Active Participations**

- ITU-T	- ISC
- ITU-R	- OIF
- ITU-D	- TM Forum
- ETSI	- TIA
- IEEE SA	- PTC
- IETF	- MPLS Forum
- 3GPP	- IPv6 Forum
- 3GPP2	.....
- TD-SCDMA Forum	
- SDR	

- Two recommendations about Qos were adopted by ITU-T SG13
- A Carrier-class QoS Solution Framework for IP-based Backbone Network – Y.123qos
- A Carrier-class QoS Solution Framework for IP-based Access Network – Y.qosar

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## Active Participations

- On July, 2003, China Telecom and Huawei Technologies together submit A Carrier-class QoS Solution Framework for IP -based Backbone Network and Access Network on the fourth seminar of ITU-T SG13 2001-2004.
- The two documents defined the framework, architecture and requirements of carrier-class QoS technology in IP -based backbone and access network.
- The two QoS proposals solve the difficulty in implementing QoS of service streams, and keeping compatibility with the present network, ensuring the application of supplementary service on IP network.
- They are added in recommendation Y.qosar and Y.123.qos. The committee assigns Huawei as the editor of Y.123.qos, and decides that the two document will serve as the basis for researching on End-to-End QoS in NGN.

