

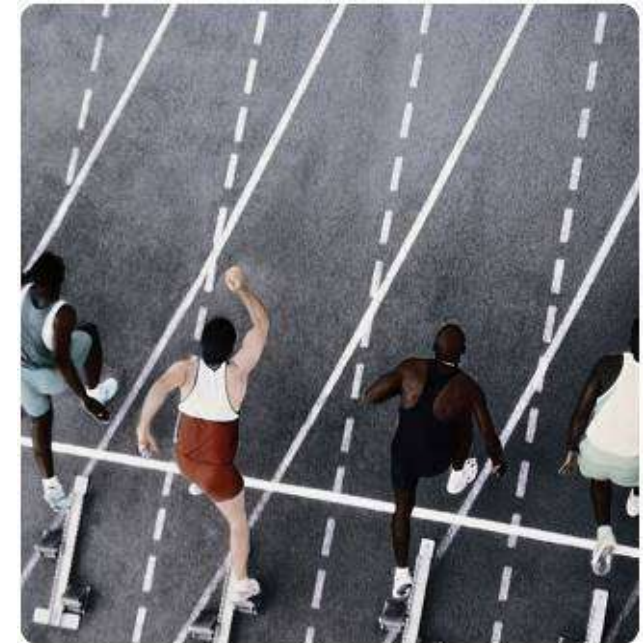
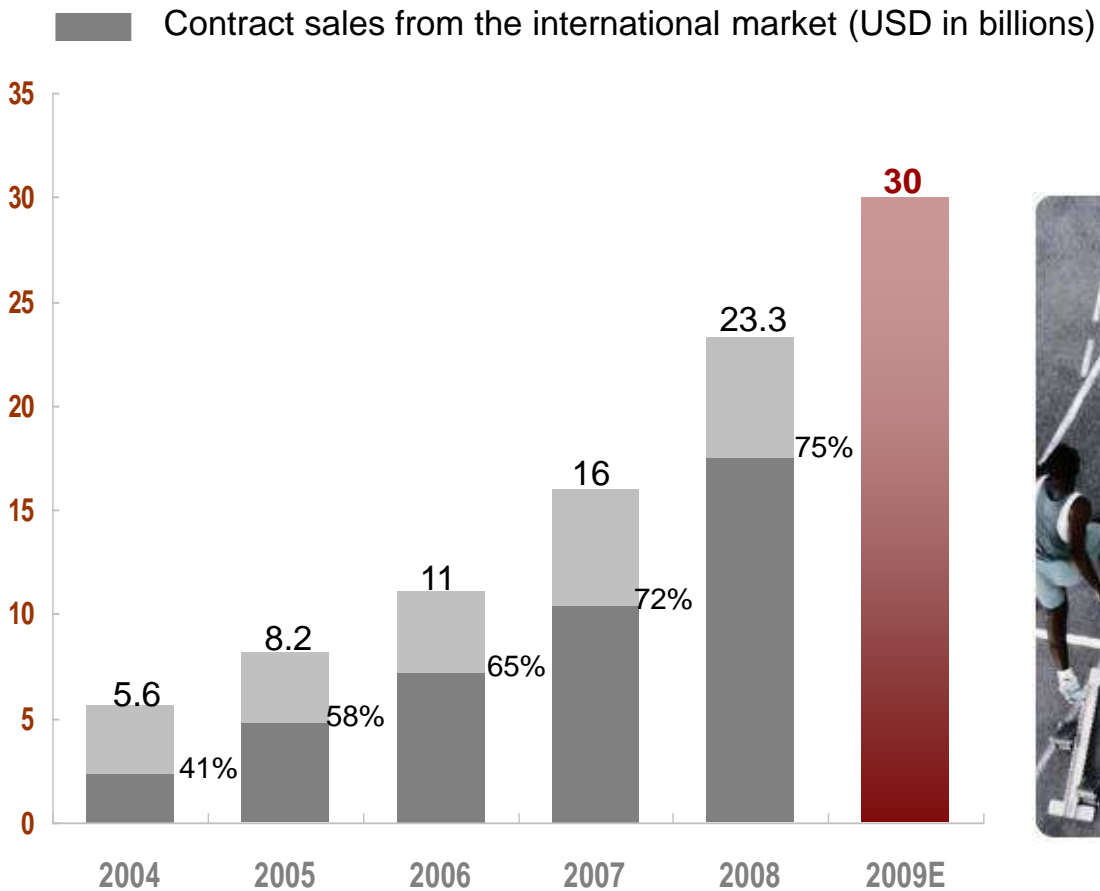
Huawei Corporate and IPv6 Network Evolution

www.huawei.com

Contents

- Global Market Progress
- Huawei IPv6 Strategy
- Creating Value for our Customers

Sustainable growth



Global operations



22 regional HQ and over **100** branch offices
14 R&D centers, **29** training centers
87,502 employees worldwide
Three-level customer service system (HQ/ regional/ local)

Serving 36 of the world's top 50 operators



- Deepen long-term strategy partnership
- Providing UMTS solutions for Vodafone in Spain, Greece, Hungary, Romania, South Africa, Turkey etc.



- Strong strategic infrastructure partnership
- Major GSM/UMTS/HSPA network supplier
- Major supplier of Broadband, Transmission and Metro Ethernet for the whole group



- Deployed networks in 20+ countries
- Corporate strategy partner for 2G/3G, FTTx, transition etc



- Solely responsible for constructing PS core networks in Germany, Britain, the Netherlands, Austria, and the Czech Republic
- Deployed GSM network in Czech republic
- IMS, NG WDM, GPON, Core router, IP Microwave, Femtocell supplier



- Mobile broadband partner for building UMTS/HSPA networks in Italy and Brazil
- Major FTTx supplier in Italy

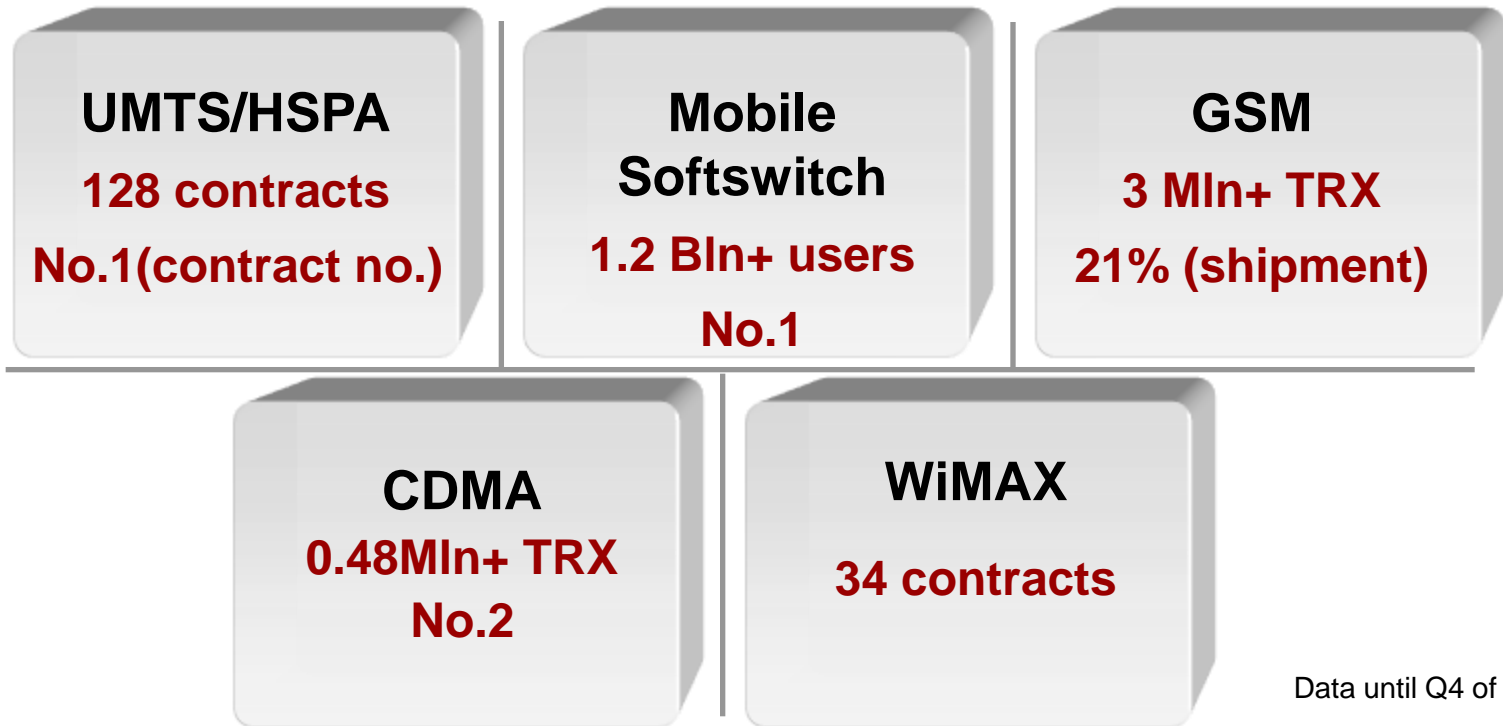


- To provide TELUS with LTE-ready HSPA network, which is the first such network in North America



- Chosen by TeliaSonera to deploy the world's first LTE/SAE commercial network in Oslo, Norway, bringing the unique advantages of mobile broadband service

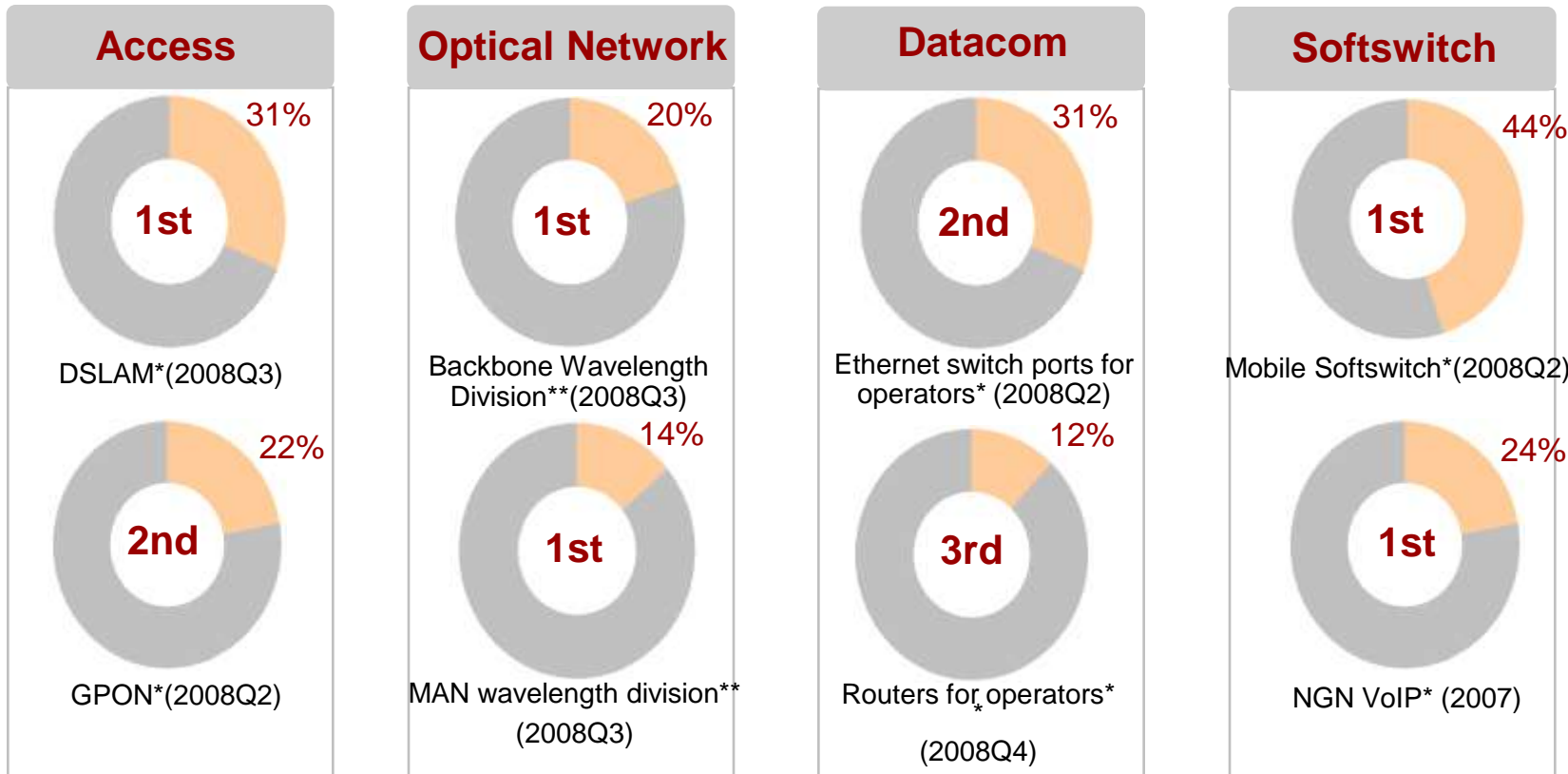
Huawei mobile market update



Data until Q4 of 2008

Large-scale adoption of WCDMA by leading operators
WCDMA/HSPA network deployment in Europe, North America and Japan
The industry's first commercial LTE contract in Europe

All-IP broadband market update



* By shipment ** By market share Source: Gartner, Infonetics, Dittberner, Ovum and etc.

Global leader in the access and optical fields; Leader in IPTime packet mobile transport
 Mobile/NGN bearer network serves over **1.3 billion** subscribers, ranking **No.1** in the world

Huawei in MENA



- **MENA office being established since year 2000;**
- **One Region and 2 sub-regions: Middle East, Northern Africa**
- **22 branch offices across MENA and active in 33 countries**
- **Over 4,800 employees, 60% of whom are local staffs**

Top 3 Vendor in MENA

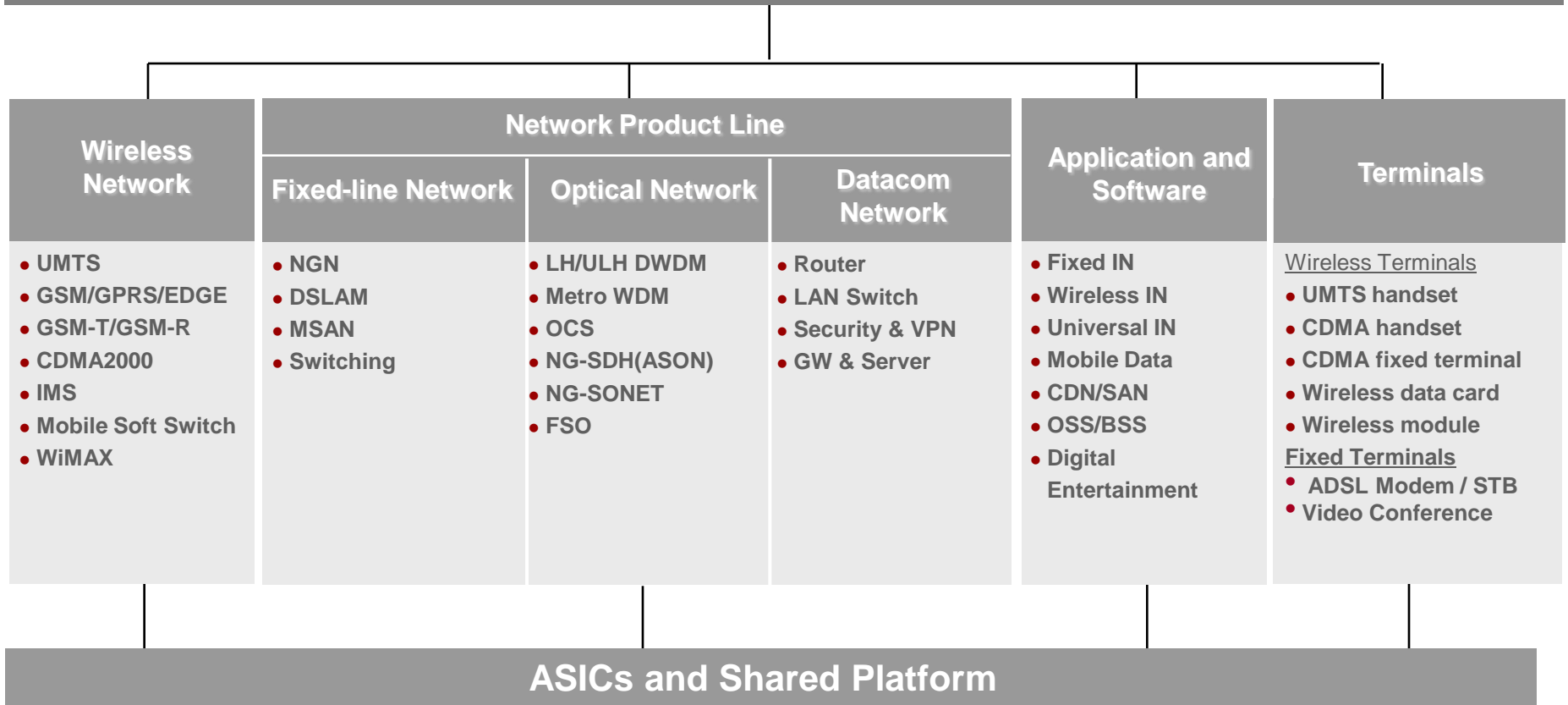
Huawei is the top3 vendor in MENA and has established partnerships with 94 operators in the region.

STC	→ operation in 7 countries
Etisalat	→ operation in 17 countries
Orascom telecom	→ operation in 12 countries
Zain	→ operation in 22 countries
Maroc Telecom	→ No.1 in Morocco
Qtel	→ No.1 in Qatar
TCI	→ No.1 Mobile operator in Iran
PTCL	→ No.1 Mobile operator in Pakistan
Algeria Telecom	→ No.1 in Algeria
Telecom Egypt	→ No.1 Fixed operator in Egypt



Huawei Product Portfolio

Customized Communications Network Solutions



- ISO 9001:2000/TL9000/CMM for quality control
- ISO 14001:2004 for environment management

Your trusted services partner

What we offer

- Network Rollout
- Network Integration
- Customer Support
- Managed Services
- Network Technology Services
- Learning Services



Customers' values

Fast Time-to-Market

Efficiency Enhancement

Seamless Evolution

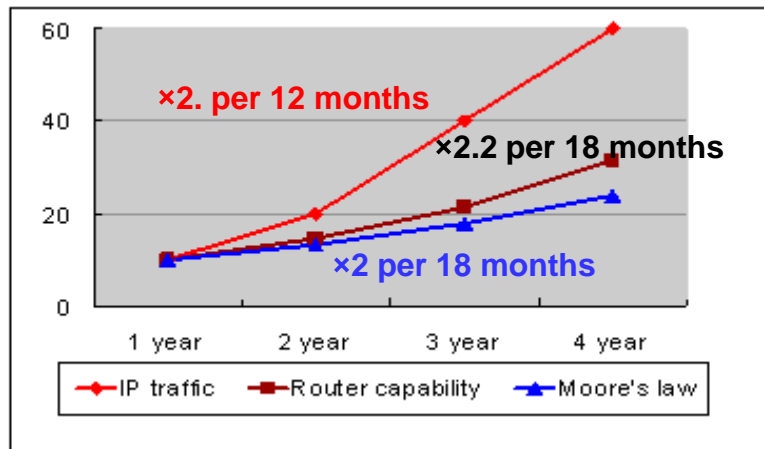
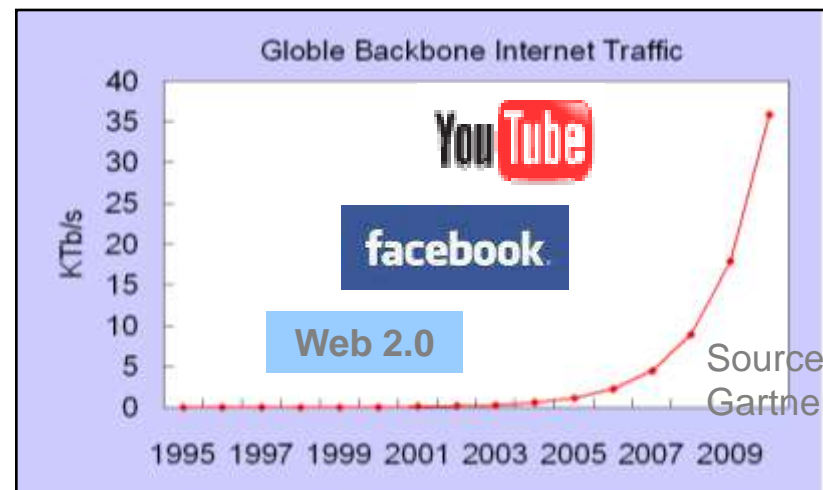
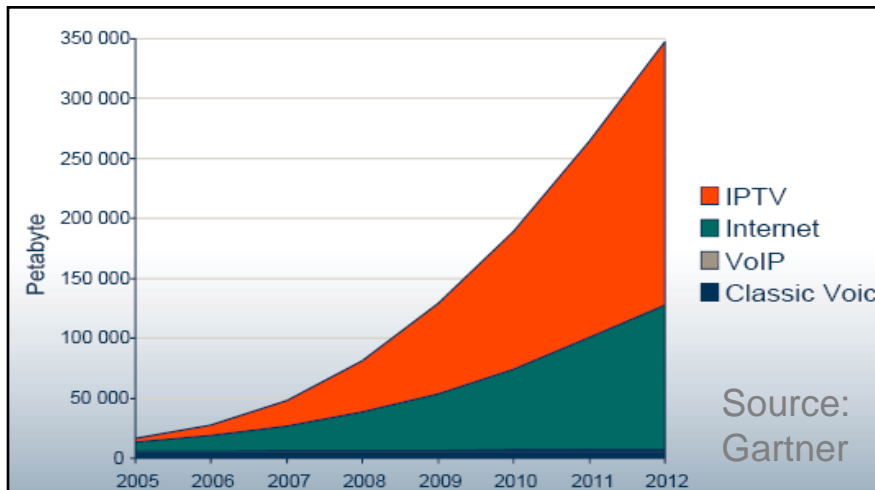
Business Transformation

Huawei attaches strategic importance to Professional Services and provides **24/7** customer service with the support of thousands of employees and engineers across the region.

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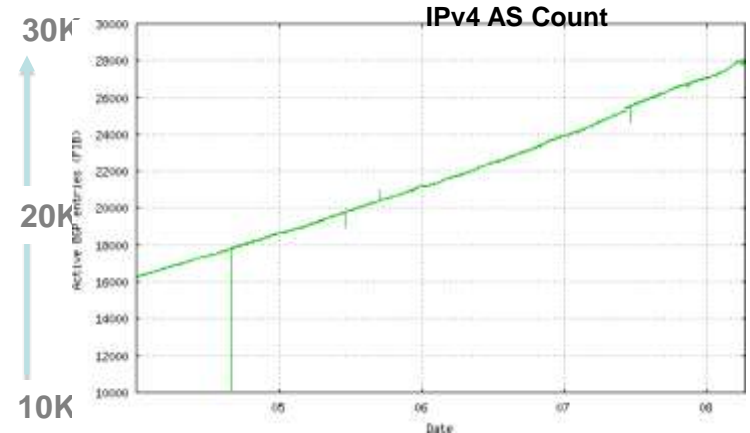
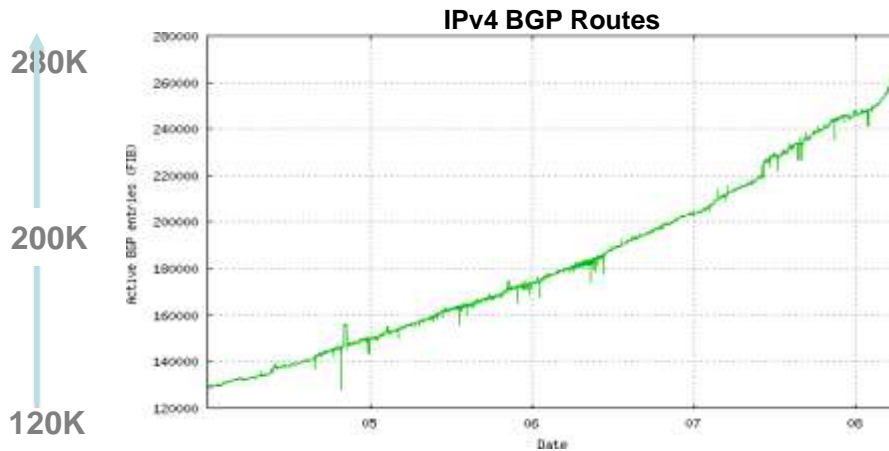
- Global Market Progress
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Booming Internet Traffic

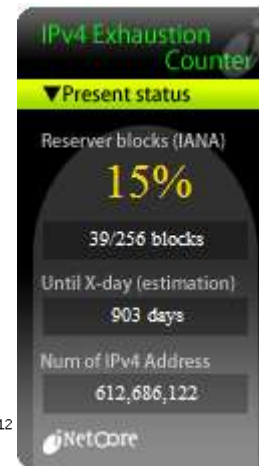
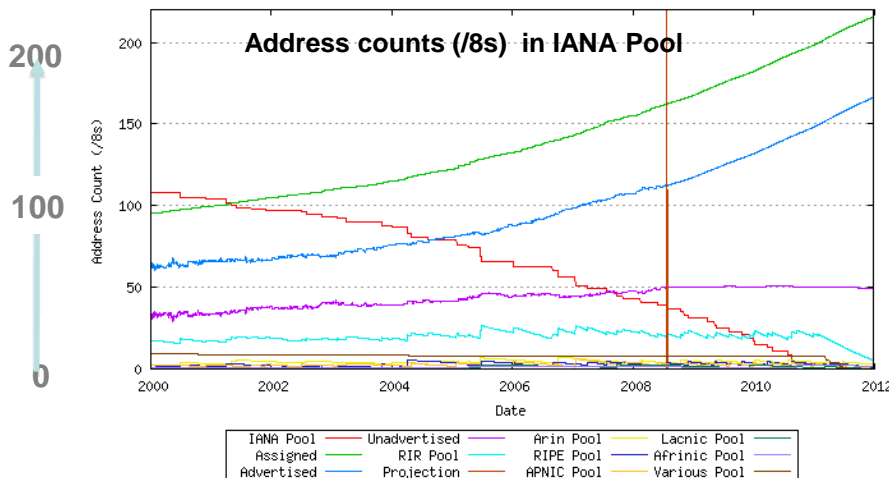


- Based on Gartner report, Internet traffic doubles ~ every 12 months
- Capacity of an individual equipment cannot keep up with the rapid growth
- Network scalability is becoming one of the major challenges

Route Expansion and Address Exhaustion

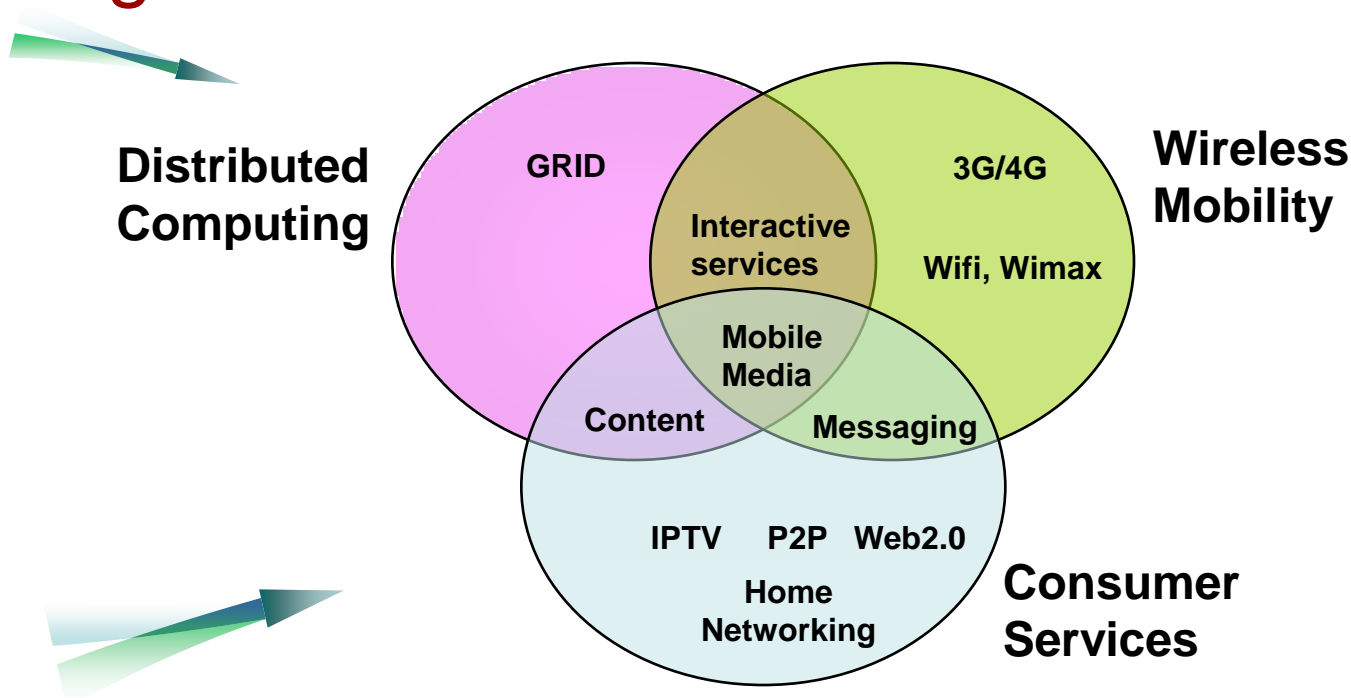


Source: IANA 2008 IPv4 Address Report



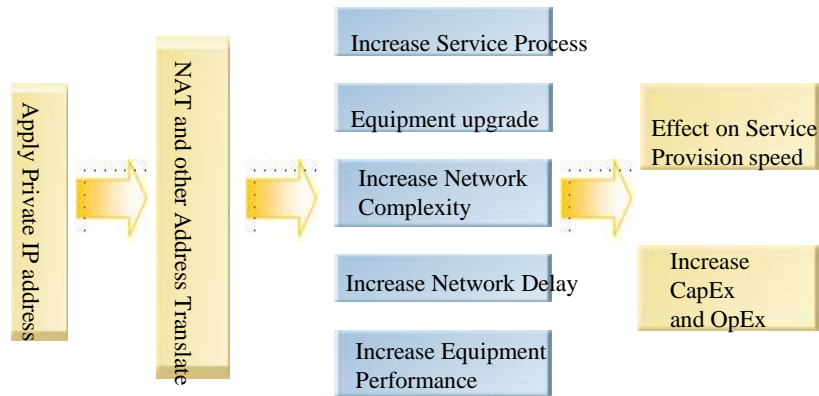
- **IANA IPV4 Routes and AS Count** increase more than 15% per year!
- **IANA IPV4 Pool** will be exhausted before 2012!

Driving to IPv6

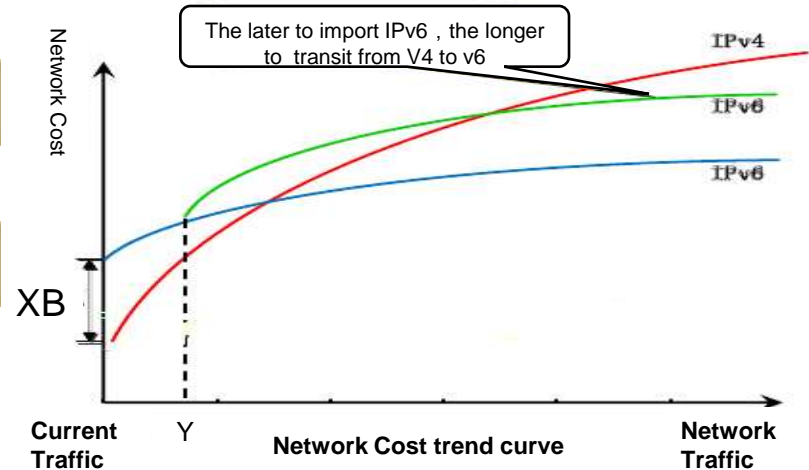


- **This despite increasingly intense conservation efforts**
 - NAT (network address translation)
 - CIDR (classless inter-domain routing)
 - PPP / DHCP address sharing
- **Theoretical limit of 32-bit space: ~4 billion devices**
- **Practical limit of 32-bit space: ~250 million devices (RFC 3194)**

IPv6 is the ultimate solution



If apply IPv4 Private Address, service provision speed will be affected and network cost will increase.



➤ NAT can slow down the consumption of IPv4 address, but not a permanent solution

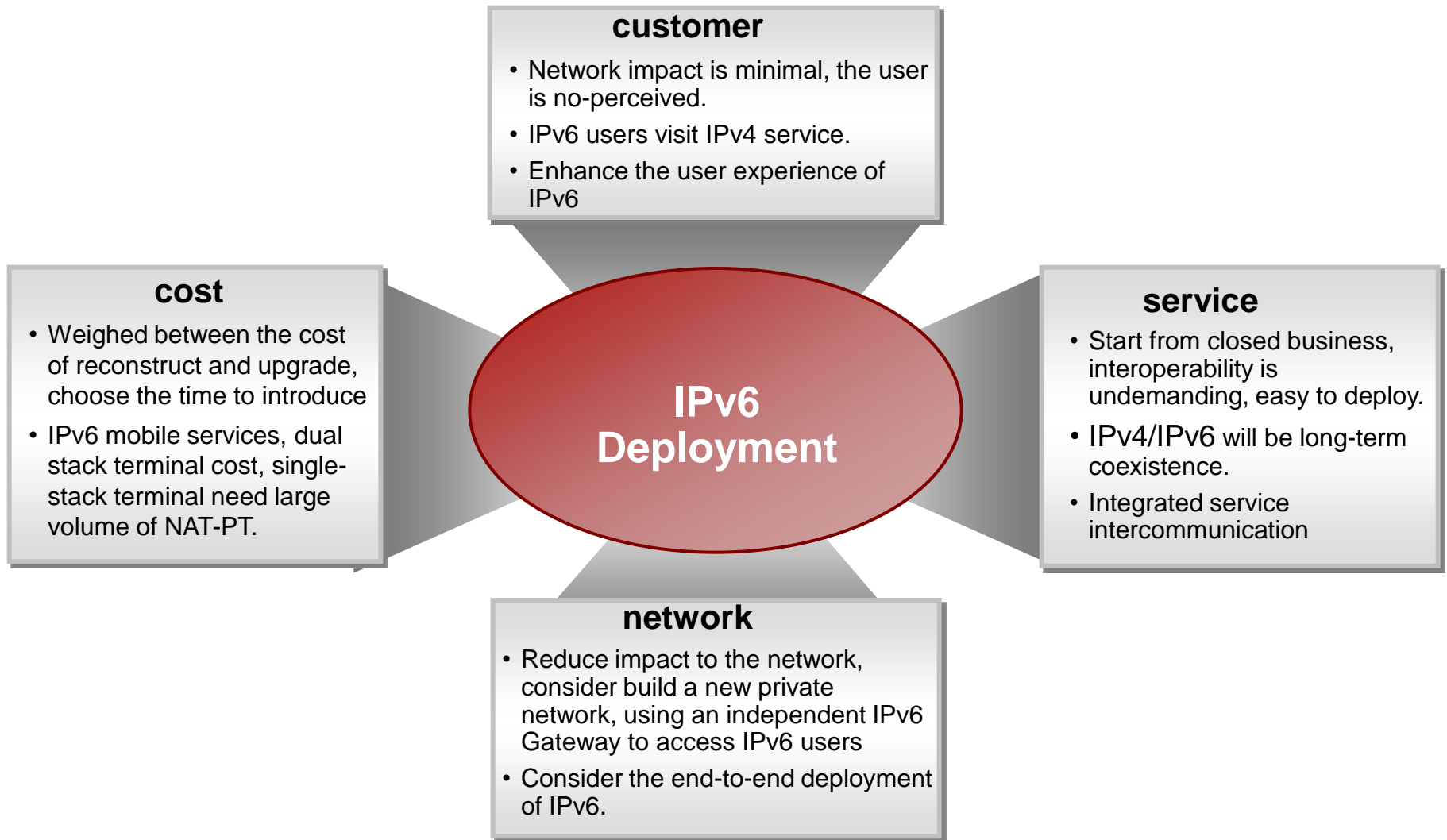
- Destruct end-to-end connectivity, NAT and ALG etc.postpone business cycle.
- Private network address space is limited, Increase the complexity of deployment.
- Reduce performance, it is difficult to deployed on a large-scale.
- Increase network cost of the long term.

➤ Later deployment of IPv6, the total cost is higher.

- At present, IPv6 transformation costs x billion. IPv4 networks need more intercommunion cost, and total cost higher than IPv6 network (blue line)
- IPv6 transformation more later, the total cost more higher and the transformation cycle more longer. (green line)

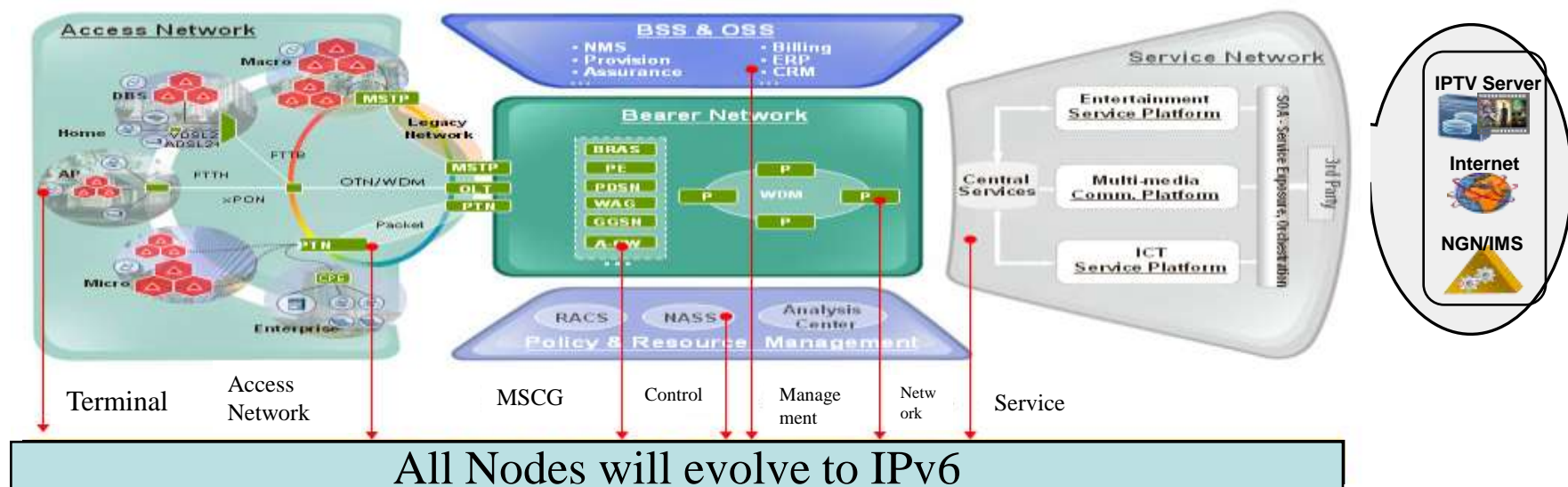
IPv6 is the ultimate to solve the shortage of IP address, it has reached consensus to deploy IPv6 globally.

Main considerations of IPv6 deployment



Evolution of IPv6 E2E Solution

IPv6 is a step-by-step evolution, IPv4/IPv6 will co-exist in a very long time



➤ The parts of IPv6 E2E evolution:

➤ the network nodes, including the access, metro, backbone, management, terminals and services.

➤ The objectives of IPv6 E2E evolution :

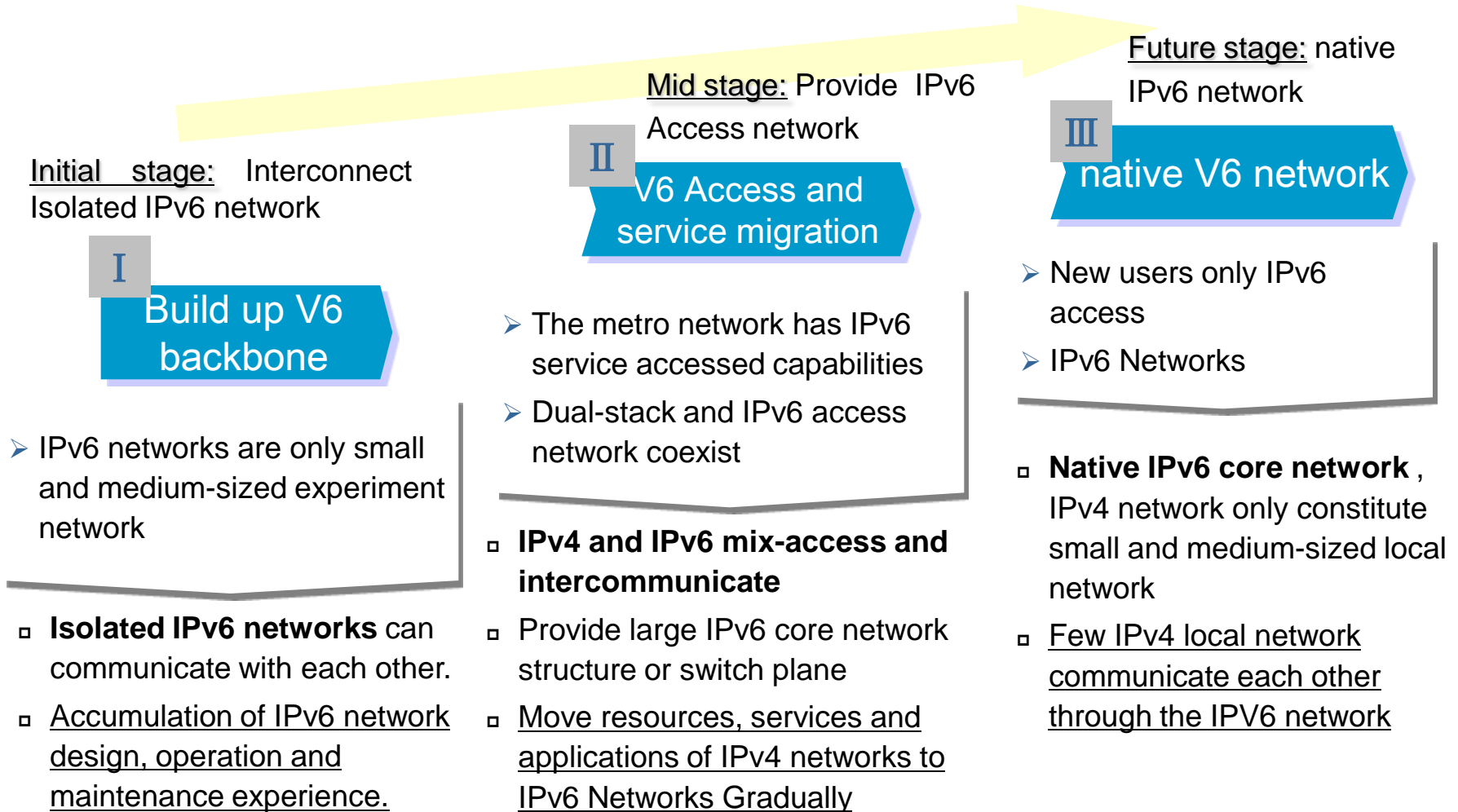
➤ upgrade the whole network to IPv6.

➤ The State of IPv6 network:

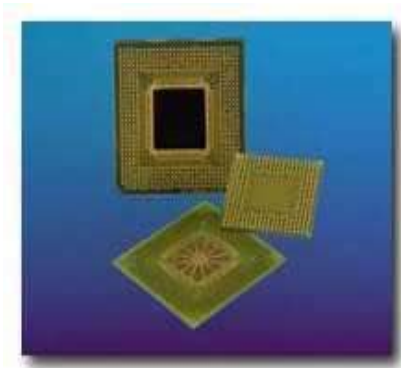
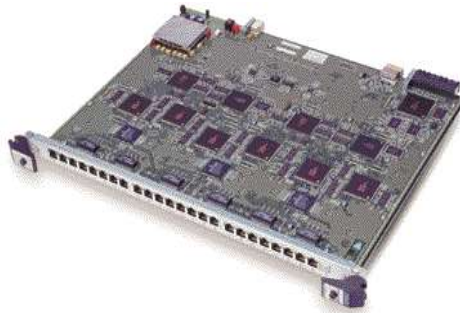
➤ Chips and external components of the main vendor equipments support IPv6 well, can be upgraded to support IPv6 natively.

➤ Main vendors support IPv6 routing, VPN and other basic protocols well; IPv6 access, interoperability waiting for standardization.

IPv6 Network Evolution Steps

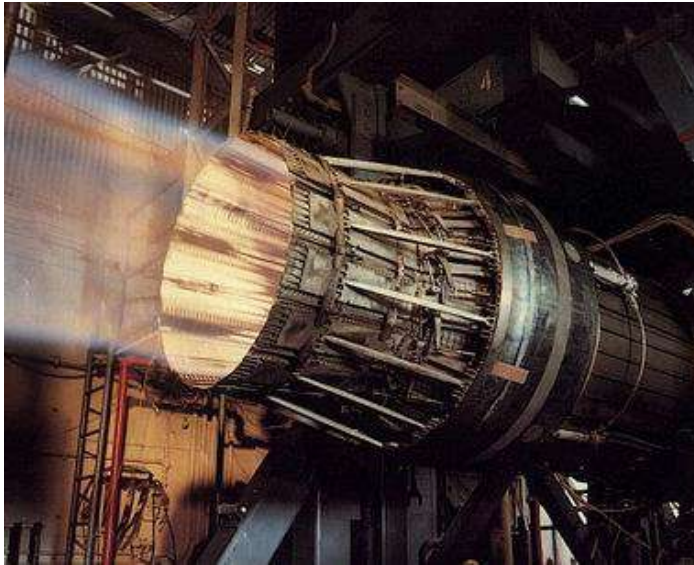


Continuous innovation - independent research and development of the IPv6 core chips



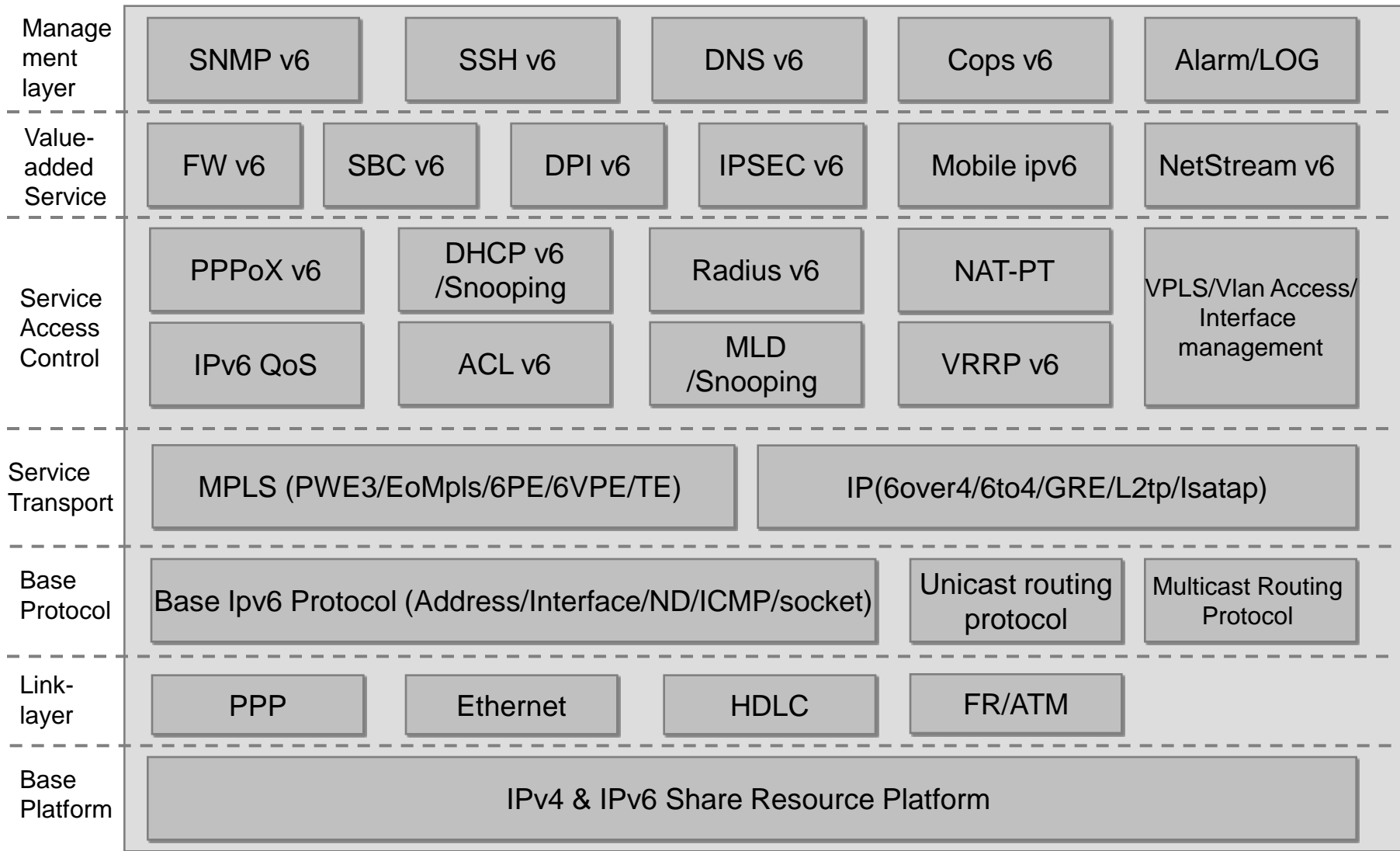
- Huawei high-level ASIC chip full support for IPv6 features,
- Greatly enhance the T-bit core router brand competitiveness

Continuous innovation - a comprehensive operating system support for IPv6 network

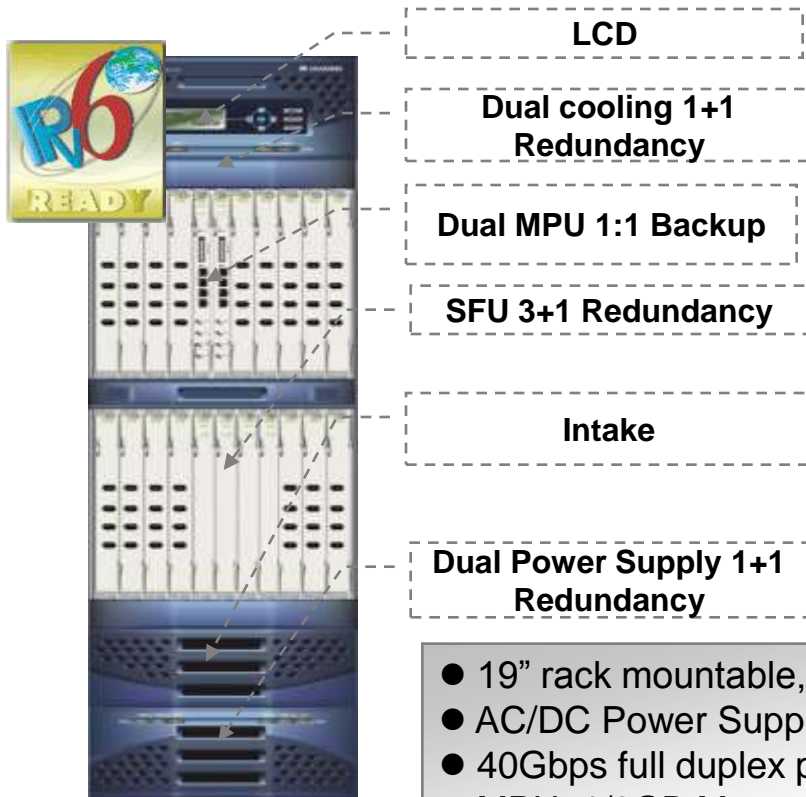


- VRP OS ® (Versatile Routing Platform) is a generic Huawei software platform IP products, VRP5 full support for IPv6
- Huawei's participation of the standard / draft more than 20, involving IPv6 multicast, mobility, security, network management, etc.; Huawei IPv6 related fields in more than 60 patents

Huawei IPv6 Architecture



NE5000E Single Chassis

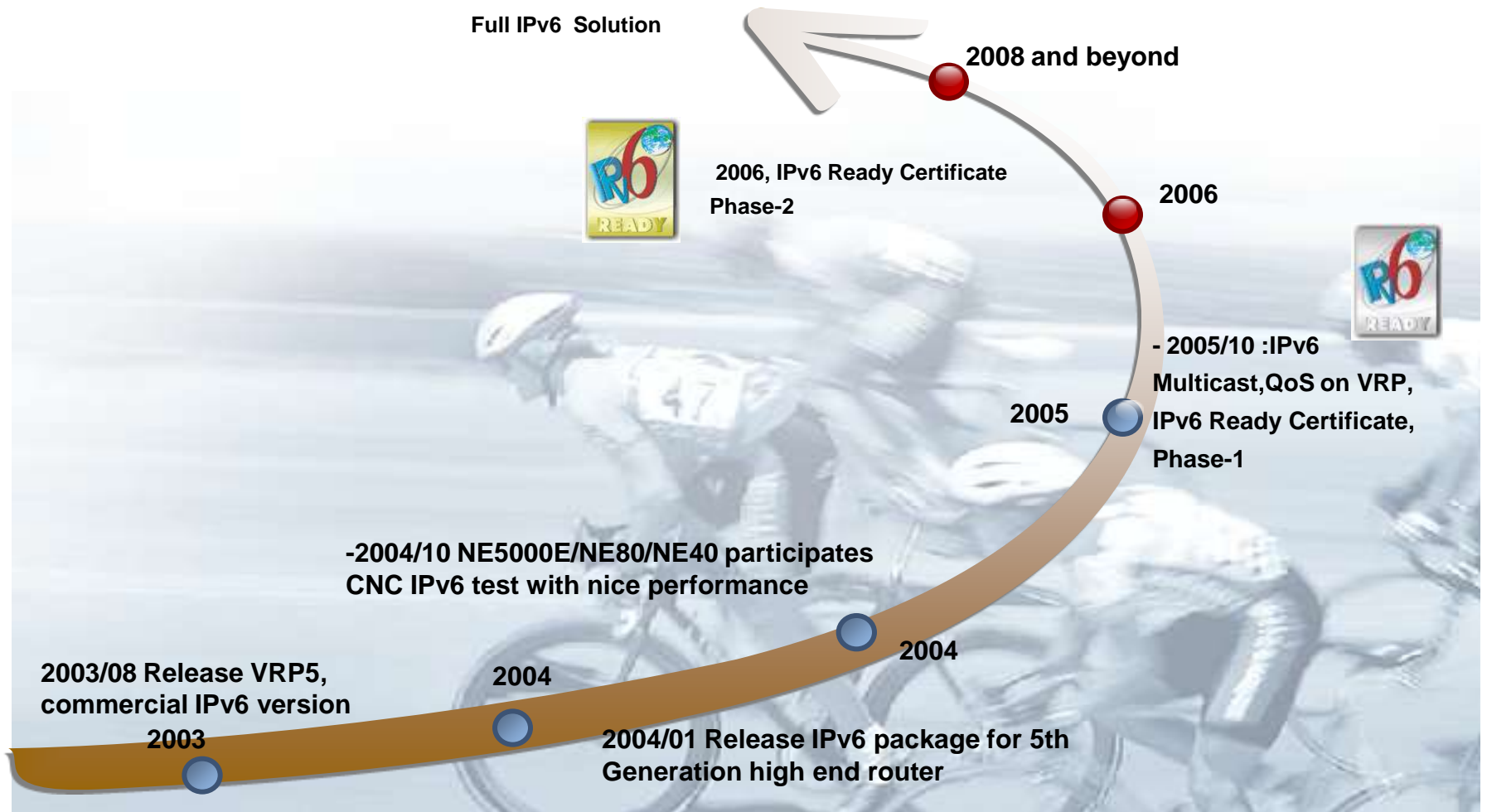


Item	Specification
Backplane Capacity	4 Tbps
Switching Capacity	2.56 Tbps
Port Capacity (bidirectional)	1.28 Tbps
Forwarding Performance	1600 Mpps

- 19" rack mountable, H x W x D = 160 x 44.2 x 66.9 cm
- AC/DC Power Supply; Max Power Consumption: 5KWatt
- 40Gbps full duplex per slot
- MPU: 1/2GB Memory, scalable to 4GB; 512M Compact Flash Card
- 16 LPU: 512MB CPU Memory, 256MB packet buffer
- 4 SFU: Non-blocking crossbar switching fabric, 640Gbps per SFU,3+1 redundancy

NE5000E fully supports IPv6 commercial use, and got IPv6 golden authentication

Huawei Contributions to IPv6










Huawei IPv6 Solution Highlights

- **Comprehensive IPv6 Support**
 - Support RIPng, OSPFv3, BGP4+, ISISv6 and ISIS multi topology
 - Support of IPV6 Multicast and IPV6 security in all the core routers.
 - IPv6 ready on all line cards and interfaces with vigorous testing
 - Support all main steam transition technologies
- **Wire Speed IPv6 Performance**
 - Only vendor with wire speed 10G POS forwarding at 60 bytes .
- **Leading Migration Solution**
 - Leading IPv6 application experience, An absolutely dominate share on CNGI
 - Distributed and hardware based Tunnel processing at wire speed
 - Only vendor with wire speed Gigabit NAT-PT capability
- **NP based 5th generation implementation**
 - Combine both the advantage of ASIC performance & CPU flexibilities.

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Industry IPv6 Deployment Status

<p>China Telecom</p> 	<p>2009 deploy Experimental IPv6 network, in 2010 try to be commercial. 2008-2009, the critical period to argue IPv6 service deployment, the Telecommunications Research Institute draft guidance of large-scale IPv6 introduction, Hunan Telecom starts IPv6 test point. In 2010 Shanghai World Expo and Guangzhou Asian Games will consider to display IPv6.</p>
<p>China mobile</p> 	<p>3G mobile broadband deploy IPV6, to resolve the limitation of private network address space. The original IPv4 reserve is very limited, the mobile broadband has more requirements. During 2010, China mobile will deploy 3G IPv6 commercial services.</p>
<p>China Unicom</p> 	<p>2010 commercial-scale test users will reach at least 20,000, China unicom will build a new type IPv6 access network, the users will be at least 15,000; upgrade existing broadband IPv4 access network, develop IPv6 end-users at least 5000.</p>
<p>France Telecom</p> 	<p>2009 Q2-Q3 FT will deploy Enterprise IPV6, in 2009 tests the family and the mobile service, in 2010 deploy the family IPv6 Livebox, the Core network maintains IPv4 temporarily. Poland subnet has strong interest, actively discusses the deployment of IPv6 solution, requests the current network equipments support dual-stack.</p>
<p>Japan</p> 	<p>IPv6 large-scale commercial from 2005, package the new concept of next-generation network, provide high-speed network services based on IPv6, leveraging next-generation network evolution, and promote various IPV6 new technologies and new services.</p>
<p>America</p>	<p>The U.S. government required government and Defense departments migrate telecommunication network into IPv6 platform before the summer of 2008. It led that the United States new applied IPv6 addresses reached 14,729 pieces, the world's ranking jumped from No. 11 to No. 1.</p>

CERNET2 in China

Background

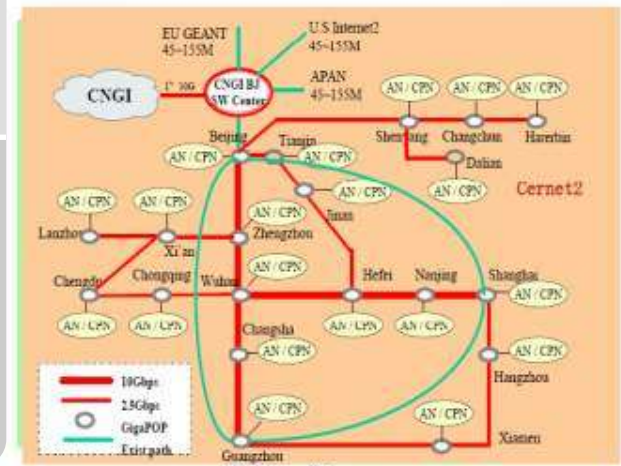
- CERNET---China Education and Research Network, built since 1994.
- CERNET2--- The world's largest pure IPv6 network, built in Dec. 2004.
- Connecting 200+ Universities and 100+ Research Institutes in China at 1Gbps-10Gbps

Huawei Solution

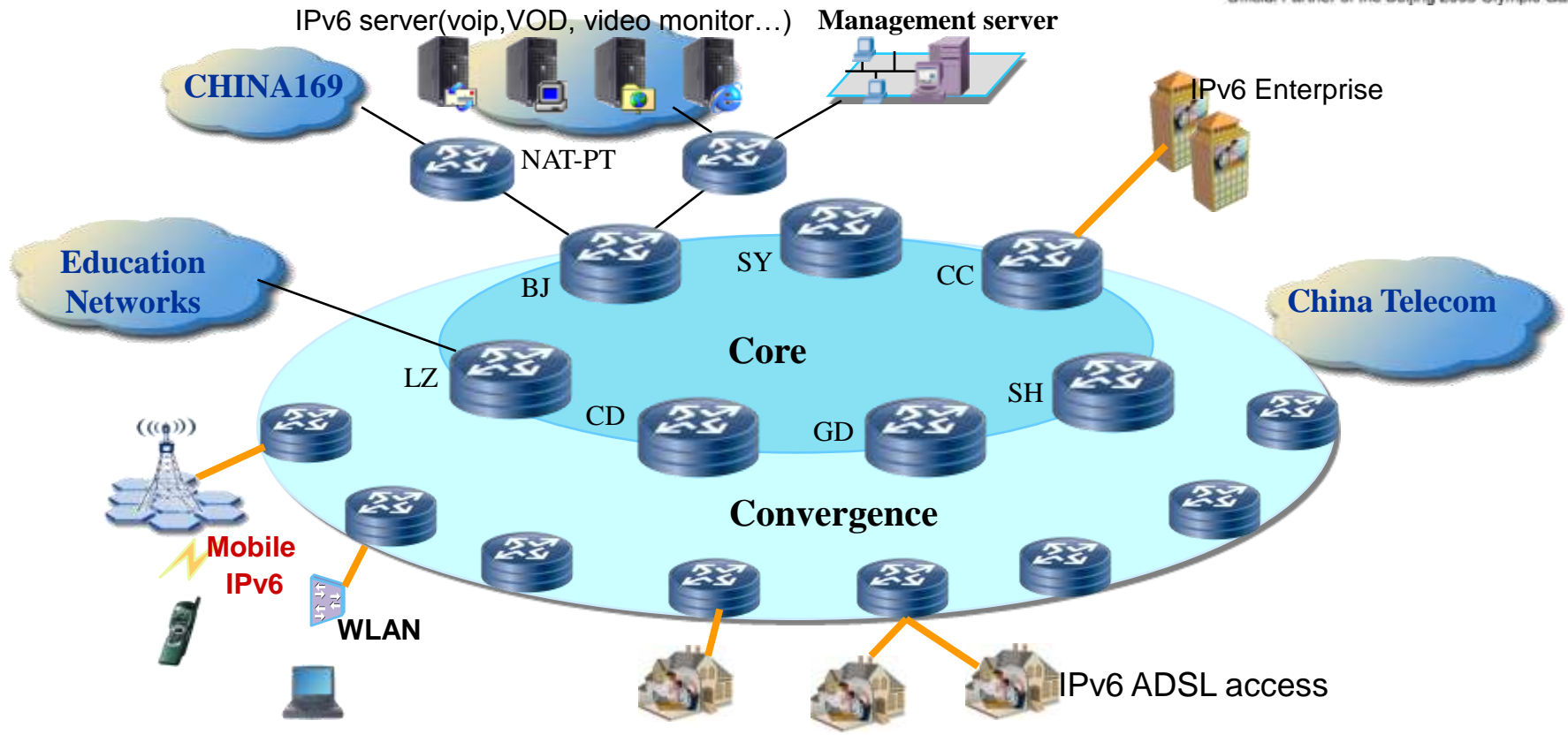
- CERNET2 backbone connecting 15-20 Giga POPs at 2.5G-10Gbps;
- Multicast, E2E performance monitoring, Middleware and Advanced Applications;
- **Over 80% of the key equipments that CERNET2 network used are from Huawei**

How Benefited

- Provide services for education and research , also for international collaboration;
- Lay solid foundation for education development

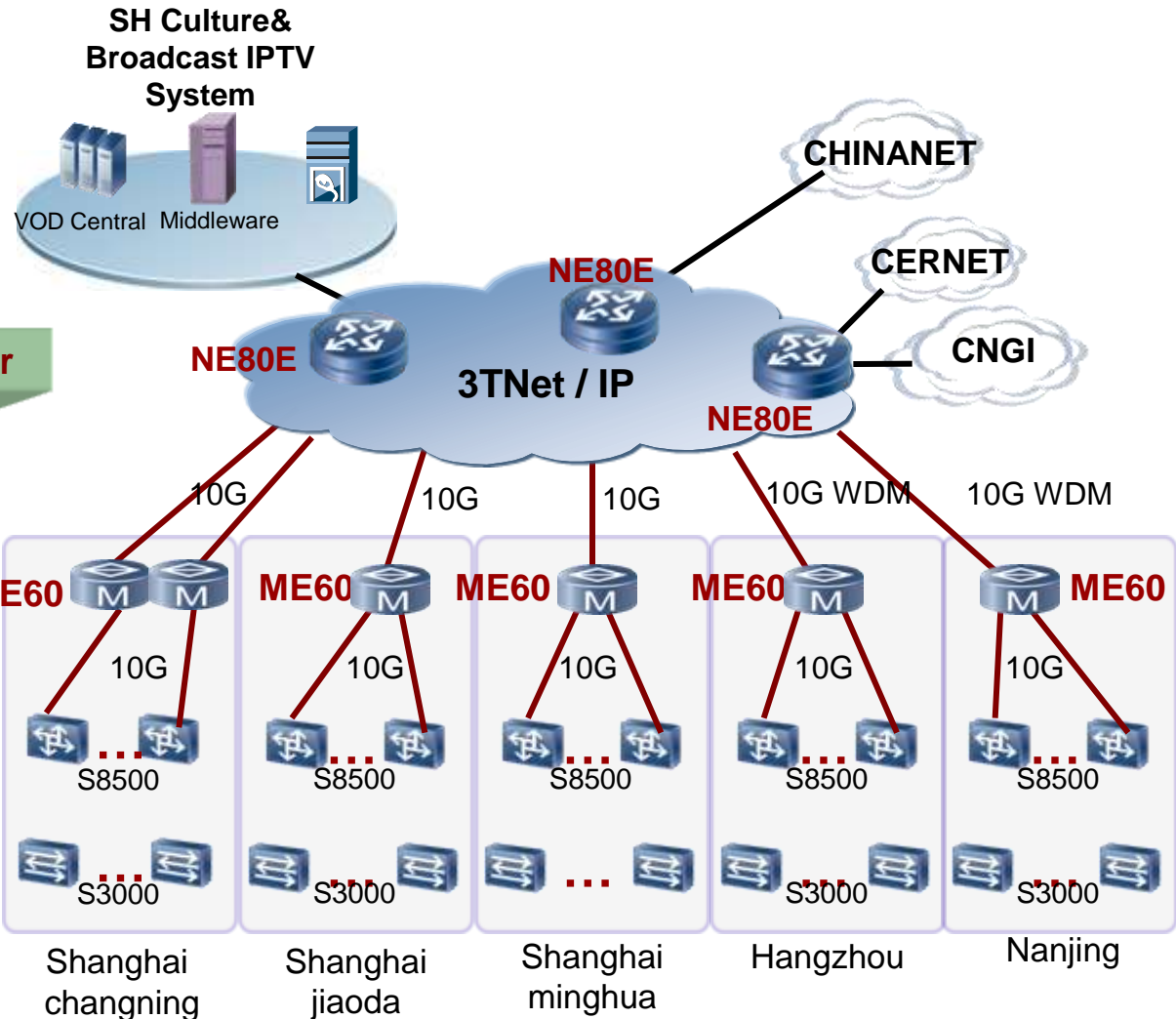


China Netcom CNGI IP Backbone



➤ Network Service : VOIP, VOD, video monitor, IPV6 adsl access, Olympics applications etc.

Shanghai 3TNET broadband multimedia network

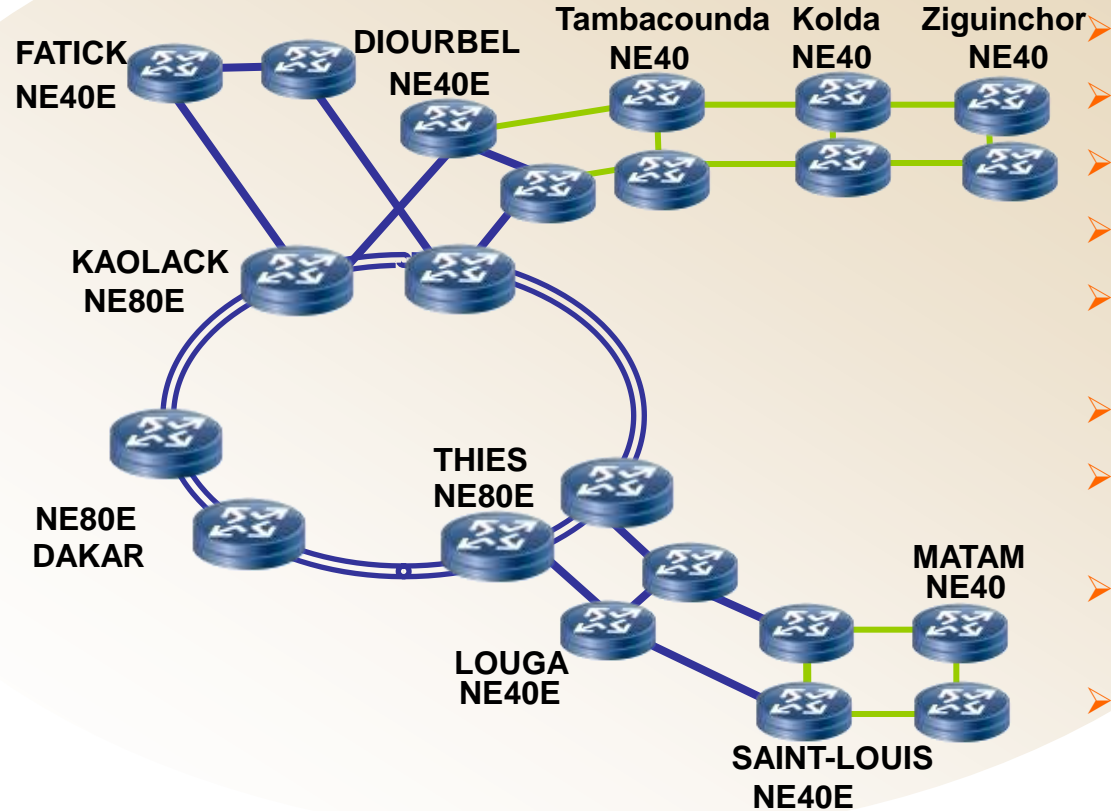


Minimum 40Mbps per user

- IPTV, internet, game service, VoIP in the future
- IPv4, IPv6 Dual stack
- 2006 December check and accept
- <http://www.3tnet.com.cn>

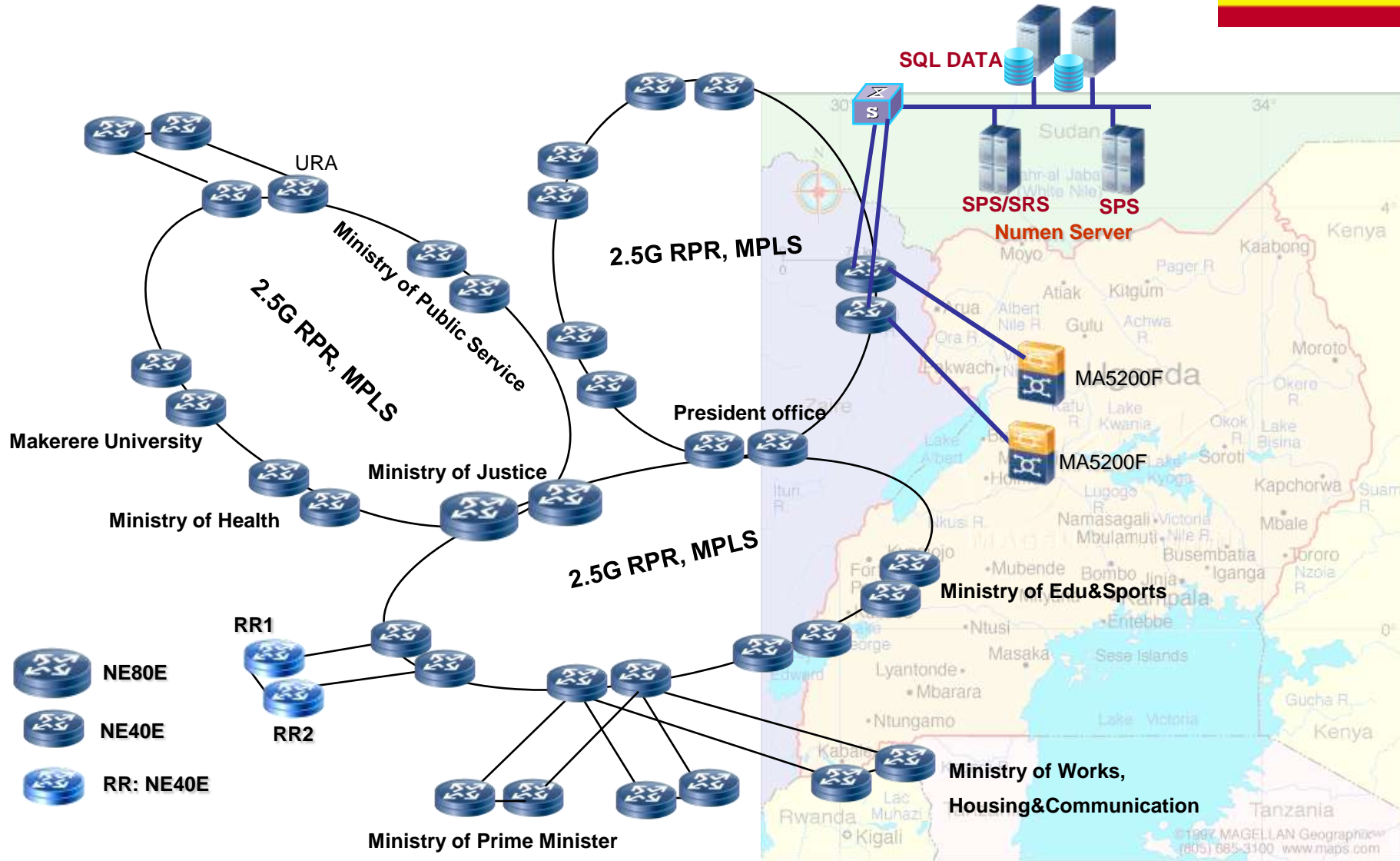
IPTV : 30k subscriber, 101 IPTV channels, 2000 VOD channels

Senegal Backbone Network Topology



- 11 regions
- 40 ministries
- Up to 60,000 users
- 3 core nodes in 2.5G RPR ring
- 4 cities covered by 2.5G optical transmission
- 4 cities covered by microwave
- Each nodes has 2 routers for redundancy
- VoIP, Videoconference, Data services
- Data center

Uganda e-Government



Thank you

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