



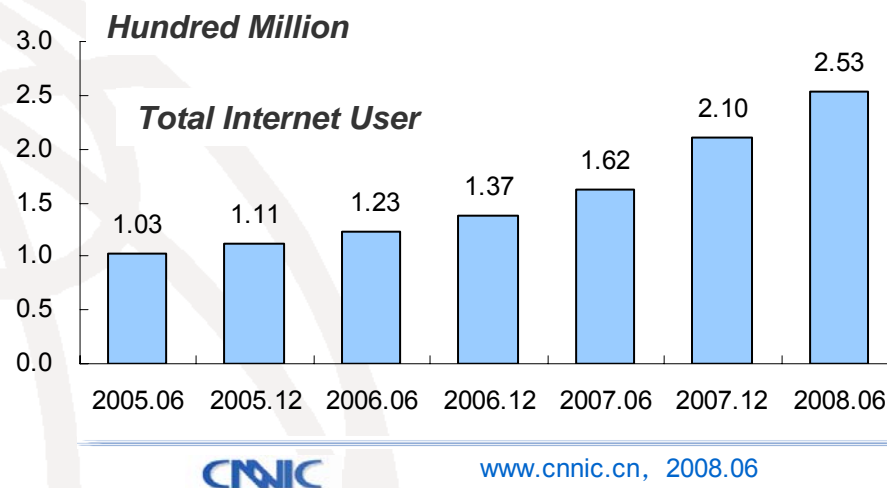
# IPv6 in China

New Olympics, New Internet Economy and New Opportunities

Liu Dong  
2008-09-04

# China Internet and Telecom Market Overview

- New MII, also called Industrialization and Information Ministry
- Big operators re-organization and 3G License
- Total mobile cell-phone user **600.75**, nearly 28.9% of the total are using mobile internet service (Source: MII)
- IPv4 Addresses: > 8 /8
- IPv6 addresses: 31 /32
- Backbone: 2.5-10G DWDM+Router
- International links: 368Gbps
- Exchange Points: over 100G (Beijing, Shanghai, Shenzhen)
- Last Miles: Ethernet, WLAN, ADSL, Cable Modem, CDMA-1x, GPRS, Dial-up, EDGE/HSDPA and 3G trial



Internet Access Adoptions		Proportion to Total Users	Users (million)
Broadband Access		84.7%	<b>214</b>
Narrowband Access	Cell-phone	28.9%	73.05
	Others	5.5%	11.50

Source: CNNIC, 2008.06

## CNGI - Government Driven Project

- A biggest IPv6 Infrastructure project in worldwide. Over 40 cities, national wide, >2.5G backbone
- A biggest IPv6 application developing project in China. over 100 projects funded by government
- A joined project initiated by 8 Ministries:

- ➡ NDRC (National Development and Reform Commission)
- ➡ MOST (Ministry of Science and Technology)
- ➡ MII (Ministry of Information Industry)
- ➡ SCIO (The State Council Informatization Office)
- ➡ MOE (Ministry of Education)
- ➡ CAS (China Academy of Science)
- ➡ CAE (Chinese Academy of Engineering)
- ➡ NNSFC (National Natural Science Foundation of China)

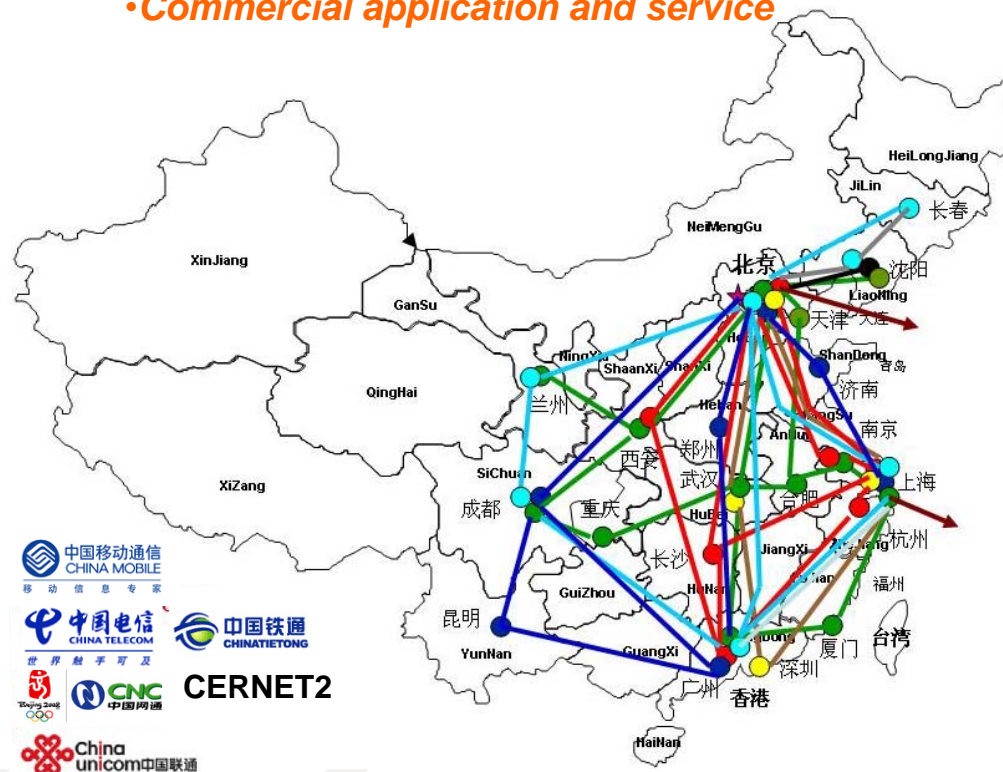
- Initial Budget 1.4billion RMB (-2005)

## 2003—2007

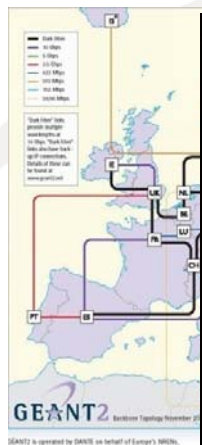
- *CNGI demonstration project*
- *Key technologies*

## 2007—2010

- IPv6 backbone, access and applications
- Mass production
- Commercial application and service



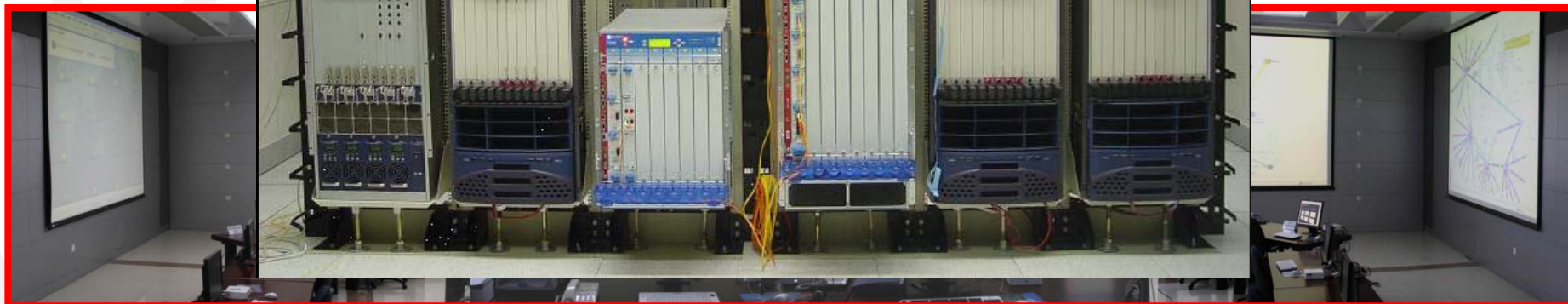
# CNGI – 6 IX



EU GEANT2



Internet2



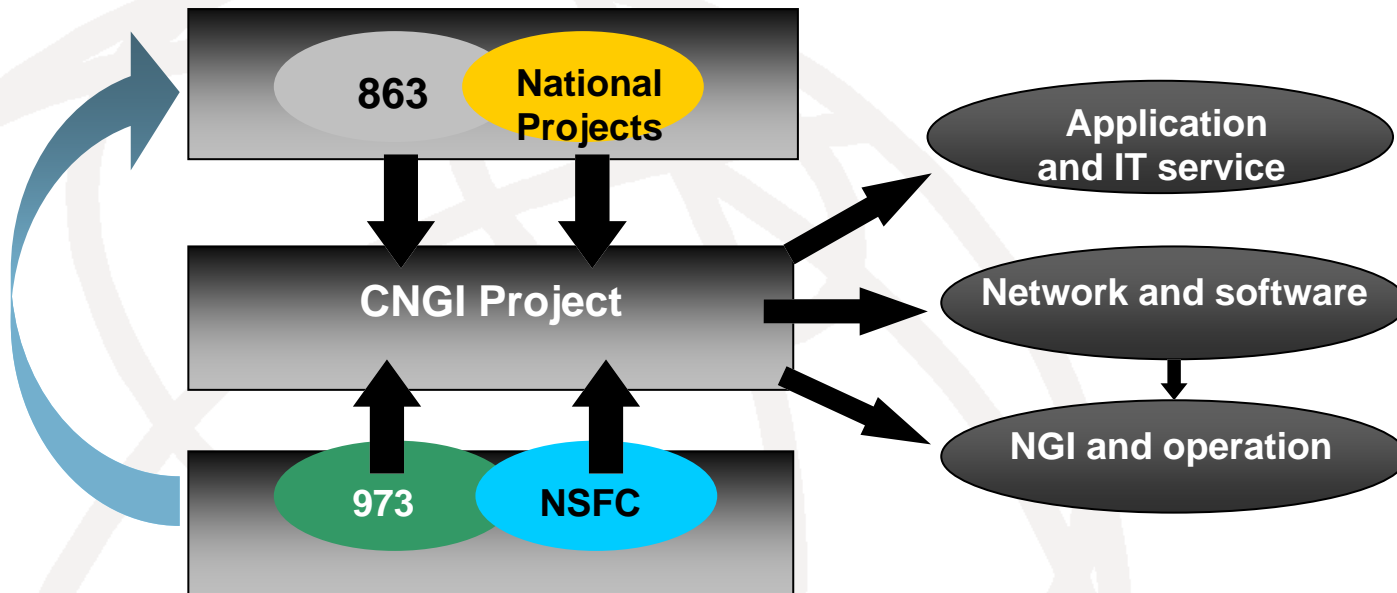
CNGI, 6 backbones

1G/2.5/10Gbps



ITU Workshop on IPv6: Geneva, 4-5 September 2008

# CNGI Model



## • Industry development relationship between CNGI and other scientific programs

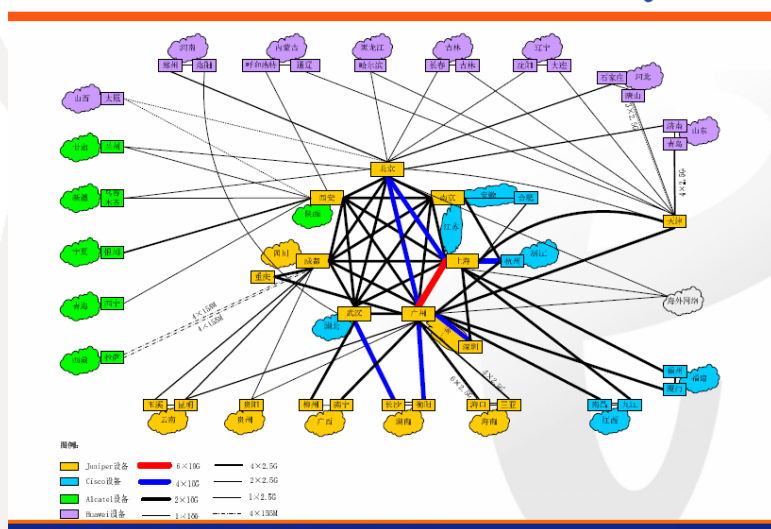
- Synchronize China IPv6 eco-system with international progress
- Demonstration network (300 CPNs)
  - 6 core networks, China Telecom, China Netcom/CAS, China Mobile, China Unicom, CERNET, China Railcom
- Research and development
  - Key technology, Middleware, Applications
- Mass production
  - Equipment and Applications



# CN2 - World biggest backbone support v4 and v6

- CN2 is China Telecom next generation multi-service convergence Carrying Network
- CN2 is the world biggest, most complicated single-domain backbone internet
- Cover 31 provinces and major 200 cities, 300 computer rooms, 7 countries and 9 overseas cities
- 865 routers, over 1400 trunk circuits
- Backbone total exchange capacity 152T, edge service network capacity 64T +

CN2全国整体网络示意图



*High  
quality  
service*



Wireless access to  
IPTV/VOD



BWA



3G



Campus wireless  
coverage

# CERNET 2 - Objectives and Vision

- Biggest IPv6 production network
- Pure IPv6 Network
- Dual stack campus network
- 100 universities
- Multi-vender Core Routers
- Authentic IPv6 Addressing Architecture
  - SAVA/SAVI: Source Address Validation Architecture
  - as a BoF proposal in IETF69 Meeting and discussed in IETF70
- IPv4 / IPv6 transition
  - Software: an IETF working group setup in IETF69, RFC4925
- Application trials
  - 6PlantLab
  - SIP over IPv6
  - IPv6 IPTV Applications
  - IPv6 based P2P Model Applications
  - IPv6 Multicast trials



**CERNET2 Backbone**



**IPv6 P2P Sharing  
Content Deliver,  
P2P Live Stream  
Video System:  
AnySee**



**IPv6 Sensor  
Networks**

# China Engines Again Next-Gen Internet

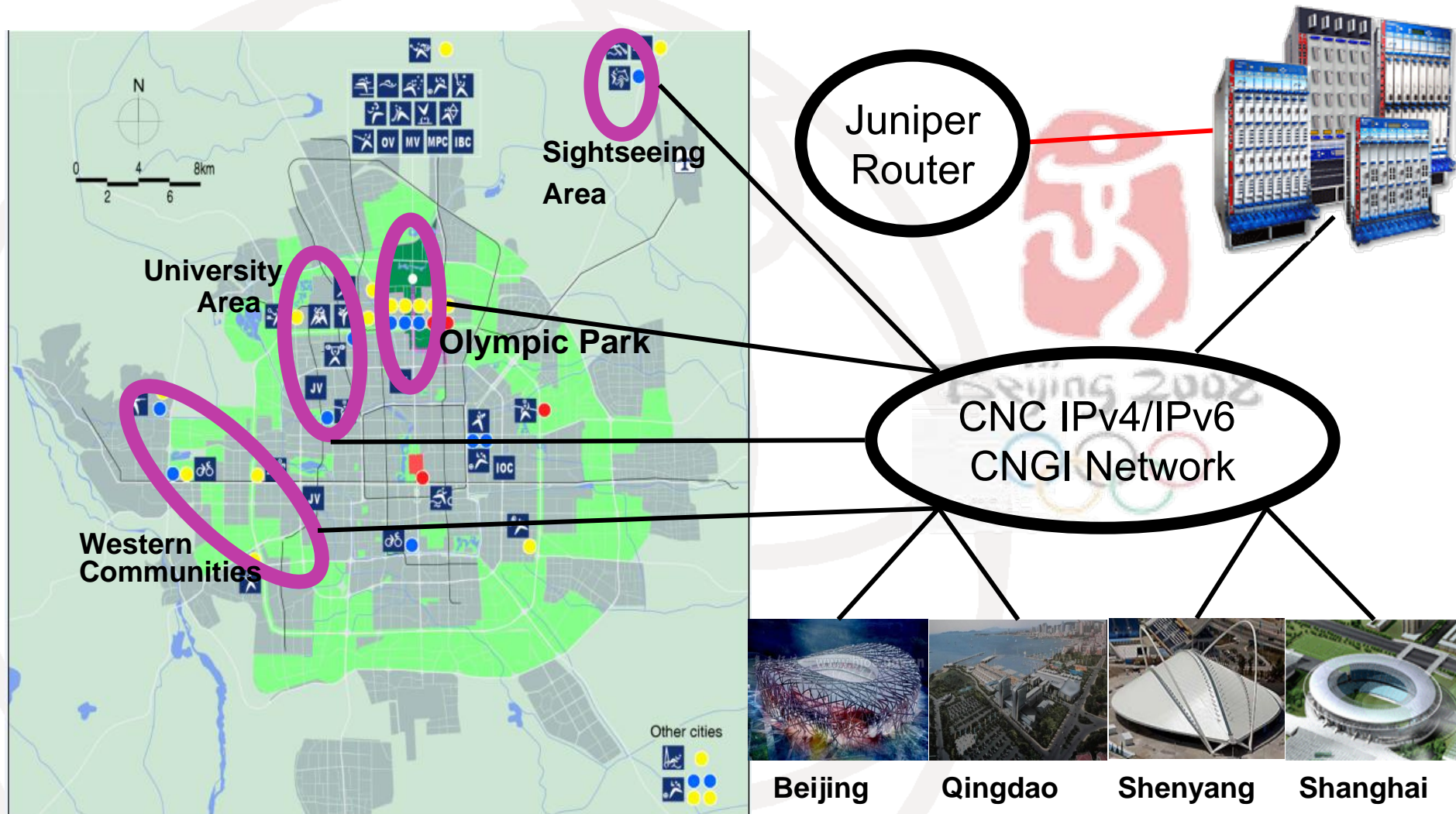
- August 22, 2008, China central government released the official notice of "Next-Gen Internet Service Trial Commercialization and Equipment Industrialization Projects"
- **Ultimate goal**
  - Upgrade CNGI Backbone and CPN, continue to promote Next-Gen Internet application in operator, scientific and other core industries
  - Promote self-innovation and core equipment scale production
  - Actively promote IPv6 service commercialization, develop at least 500,000 IPv6 trial commercial users before the end of 2010
  - Promote the transition from trial to real commercial, cultivate new economic growth point
- **Core projects coverage**
  - **Network Upgrade**
    - Next-Gen Internet application in core industries
    - IPv6 upgrade in campus network
    - IPv6 broadband access trial commercial use
    - IPv6-enabled broadband network trial commercial use
    - New IP-carrier network trial commercial use
  - **Key Technology and equipment production**
    - Mobile Communication IPv6 access gate
    - IPv6 broadband multimedia access gate
    - IPv6 wireless surveillance control system
  - **Standardization**
    - CNGI projects specifications
    - Test specification for Next-Gen Internet key equipments
    - Etc.





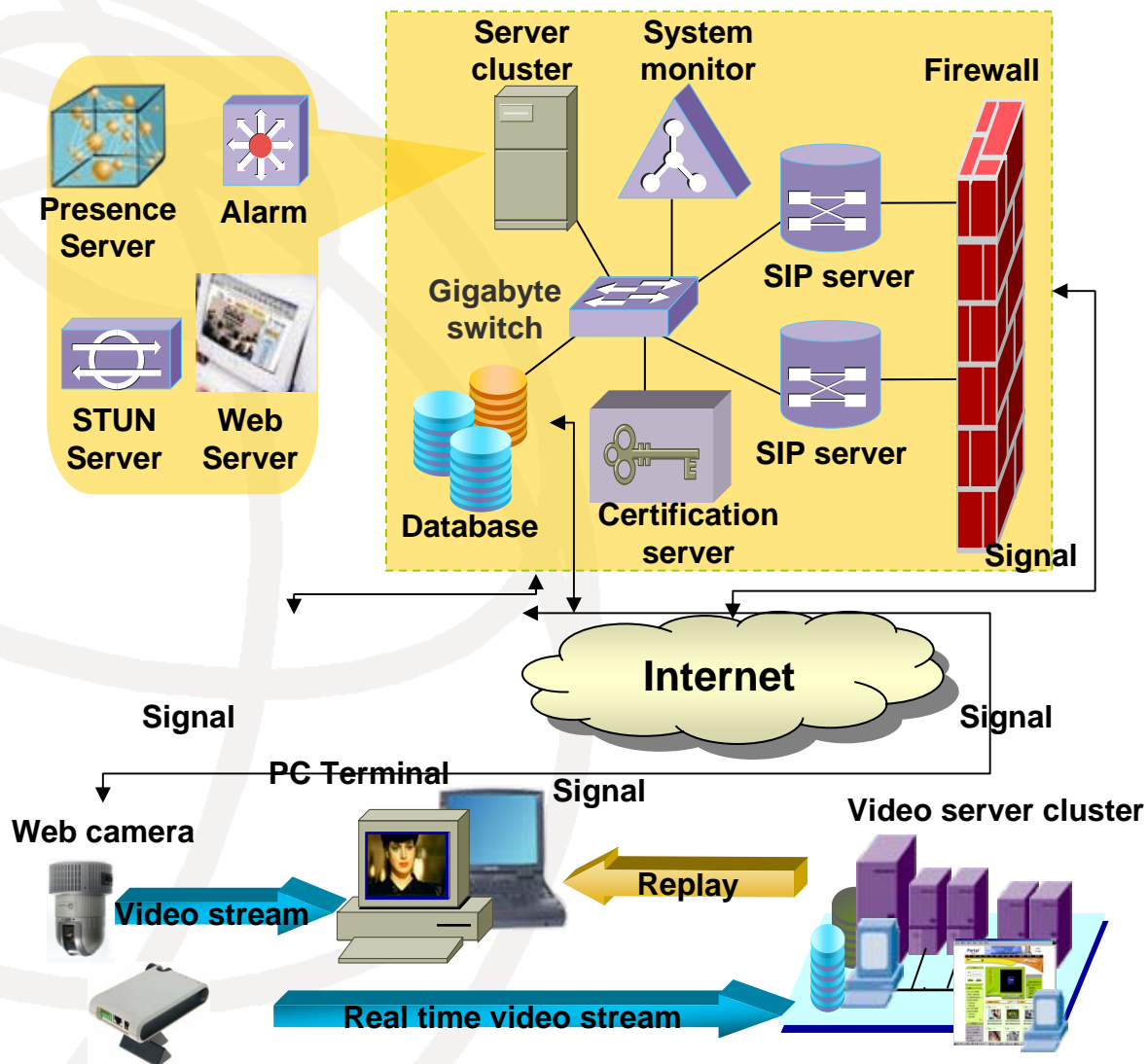
# IPv6 Application in 2008 Beijing Olympics

# Olympic Access Service



# Olympic Surveillance - Remote video network

- The world first IPv4/IPv6 Surveillance and Sensor System
- Innovative architecture: Single system support 5000-20,000 users, large scale distributed deployment
- Support IPv6, seamless transit to next generation network
- Plug and play, easy and efficient operation



# The world first IPv4/IPv6 Surveillance and Sensor System

**Technical provider of 2008 Olympics  
IPv4/IPv6 based large scale remote  
surveillance management system.**

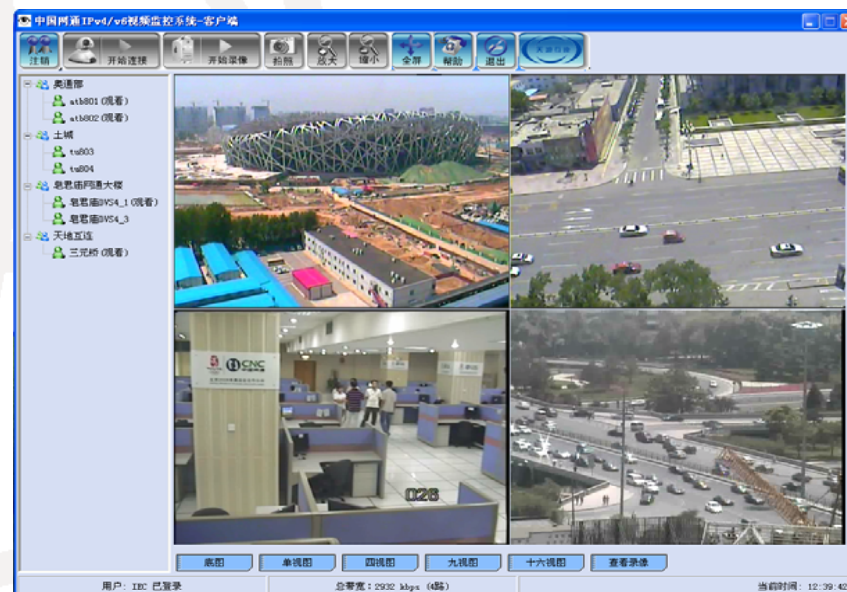
**Deployed in over 50 Olympics  
stadiums in China!**

国家体育场  
国家游泳中心  
国家体育馆  
北京射击馆  
北京奥林匹克篮球馆  
老山自行车馆  
顺义奥林匹克水上公园  
中国农业大学体育馆  
北京大学体育馆  
北京科技大学体育馆  
北京工业大学体育馆  
北京奥林匹克公园网球场  
北京奥林匹克公园射箭场  
北京五棵松体育中心棒球场  
朝阳公园沙滩排球场  
老山小轮车赛场  
铁人三项赛场  
公路自行车赛场

奥体中心体育场  
奥体中心体育馆  
北京工人体育场  
北京工人体育馆  
首都体育馆  
丰台体育中心垒球场  
英东游泳馆  
老山山地自行车场  
北京射击场飞碟靶场  
北京理工大学体育馆  
北京航空航天大学体育馆  
国家会议中心击剑馆  
北京奥林匹克公园曲棍球场  
青岛奥林匹克帆船中心  
香港奥运马术比赛场  
天津奥林匹克中心体育场  
上海体育场  
沈阳奥林匹克体育中心  
秦皇岛市奥体中心体育场



北京2008年奥运会合作伙伴  
OFFICIAL PARTNER OF THE BEIJING 2008 OLYMPIC GAMES





# Olympic Surveillance - Demo

中国网通IPv4/IPv6视频监控系统

窗口(W) 设备(D) 配置(C)

- 数字北京大厦B座11层
  - TOC1
  - TOC2
  - TOC3
  - TOC4
- 数字北京大厦B座10层机房
  - MDR1
  - MDR2
- 数字北京大厦B座10层过道
  - aisle1
  - aisle2
- 数字北京大厦A座11层
  - Hall1
  - Hall2
- 数字北京大厦A座10层
  - cam1
  - cam2
  - cam3
  - cam4
- 黄村TER
  - HCTER1
  - HCTER2
  - HCTER3
- 朝阳公园沙滩排球场
  - CBVTER
- 丁林宾馆

开始 中 3.. T.. T.. T.. T.. a.. c.. M.. c.. H.. 10:44

**MDR1 带宽: 129 kbps**

**TOC4 带宽: 171 kbps**

**TOC3 带宽: 176 kbps**

**cam3 带宽: 143 kbps**

**aisle1 带宽: 496 kbps**

**TOC2 带宽: 207 kbps**

**Hall2 带宽: 266 kbps**

**cam1 带宽: 130 kbps**

**TOC1 带宽: 139 kbps**



# Olympic ITS IPv6 Surveillance Management

## IPv6 & ITS

**IP based multicast communications convergence**

**Enhanced Security**

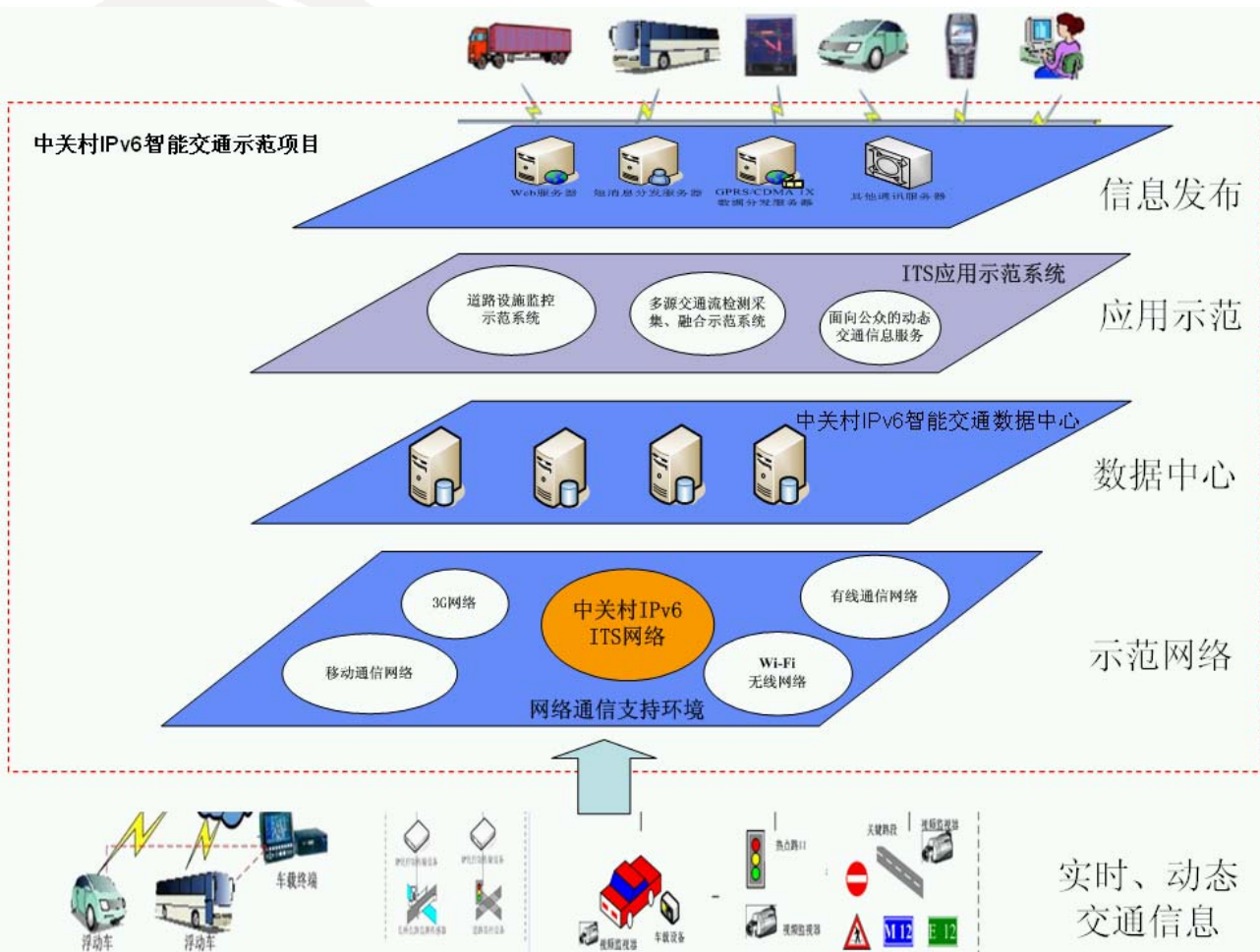
**Mobile IP seamless connectivity**

**Plug and Play**

**Plenty IP addresses**

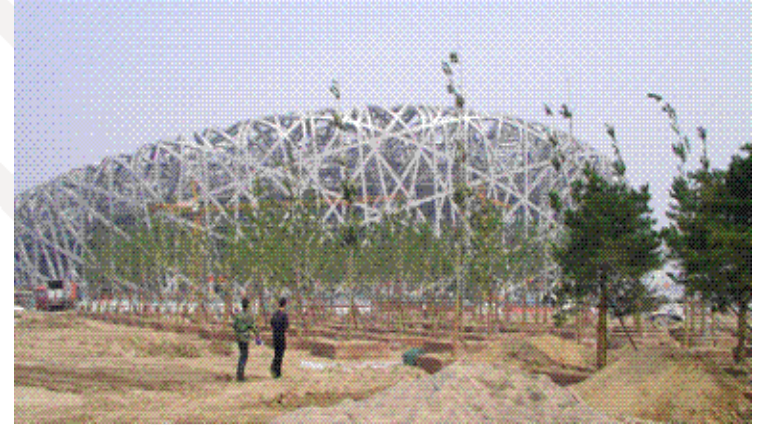
**End-to-End Communications**

**Large information collection**



# Olympic IPv6 Lighting System

## Lighting System- Main Stadium District Control by IPv6 Facility Manage & Control



### Lightening Management & Control

- Using IPv6 based Facility Networking
- Area Management System, i.e., not single facility but multiple facilities
- 1.4kmx2.4km with 18,000 lights
- 1,000 IPv6-based control nodes
- 10% Energy saving

# Olympics Official IPv6 Website

- **You are about to visit the IPv6 version of the official website of the Beijing 2008 Olympic Games!**
- Beijing Olympics Official IPv6 website has been launched (ipv6.beijing2008.cn)
- The world first IPv6 based website for Olympics
- It is published to all the world through CERNET2



# Conclusion

- CNGI has achieved great progress
- CERNET has cultivated many IPv6 human resources for China
- Industrialization Upgrade
  - Government re-organization will speed up the industrialization upgrade process
  - Leverage IPv6-enabled Next-Gen Internet to build intelligent infrastructures
  - Construct “Green Society”, promote Energy Conservation and Emission Reduction concept
- New Internet Economy
  - 2008 Olympics has dramatically accelerated the maturity of IPv6 application and service
  - China believes that IPv6 is the key to meeting the demand of its fast-growing internet economy
  - As the world largest internet user country, China will become the one of the engines and flagships to new internet economy
- China is resolutely to become an innovative center, we already have good foundations, look forward to more co-operations with the world





# Back up slides



# Appendix: BII Introduction

## ■ Position

- Pioneer and promoter of Chinese telecom and IT industry

## ■ History

- BII Group originated from BII (Beijing Internet Institute) in 1995. BII is the first private research and industrialization institute focusing on IT and Telecom in China.

## ■ Business Field

- IPv6 product and service
- Consulting and Event Organization
- IT Testing and Certification
- Network Design / SI



# Appendix: Liu Dong's Profile



## ■ Enterprise Position

- ➔ 1995, Founder of China first internet institute, BII (Beijing Internet Institute), CEO and President
- ➔ 1999, Founder of BII Group Holdings, CEO and President of BII Group

## ■ Industry and Academic Positions

- ➔ From 2001, Co-founder and Board, China Internet Society
- ➔ From 2001, Advisor, ICANN Government Advisory Community of MII (Ministry of Information Industry)
- ➔ From 2003, Board & Fellow of IPv6 Forum, Chair of China IPv6 Council
- ➔ From 2005, Chair and President, Beijing Ubiquitous Society
- ➔ From 2005, Founder & Chair, Z-Park NGI (Next Generation Internet) industry Alliance
- ➔ From 2005, Member of Expert Working Group, China Next Generation Internet Project (CNGI Project)
- ➔ From 2005, Director of WiMAX Forum China Region
- ➔ From 2006, Director of WiMedia Alliance China Region
- ➔ From 2008, Chair of China Mobile Internet Forum
- ➔ From 2001, Deputy General Director and fellow, BII-BUPT (Beijing University of Post Telecom) NGI R&D Lab
- ➔ From 2002, Chair of IPv6 Ready Test Center in China
- ➔ From 2004, Member of Expert Consultative Committee, "Digital Signature Law" Committee, State Council Law Office, "Telecommunication Law" Committee of State Council Law Office
- ➔ Member, Asia Broadband Forum

## ■ Professional Awards and Honors

- ➔ April 2004, "IPv6 Internet Pioneer", granted by Dr. Vint Cerf on behalf of Global IPv6 Forum
- ➔ 2005, "Top 100 Elite", granted by SINA.COM (China largest Portal)
- ➔ March 2007, Lead BII Group win "Z-Park Innovative Enterprise Top 100", granted by Beijing Municipal Government, China Science and Technology Ministry, China Academy of Science
- ➔ December 2007, Lead BII Group win "First Grade Award" for IPv6-Based Video Surveillance R&D and Olympics Innovation Application Project. Granted by China Communications Society of MII