



R&D on Future Internet in Korea

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Future Internet Forum

❖ Internet in Korea

❖ Selected R&D Projects

- Fundamental Technologies for Future Internet
- Models for Future Internet
- Center for Next Generation Network and Service
- Future Internet Platform Project

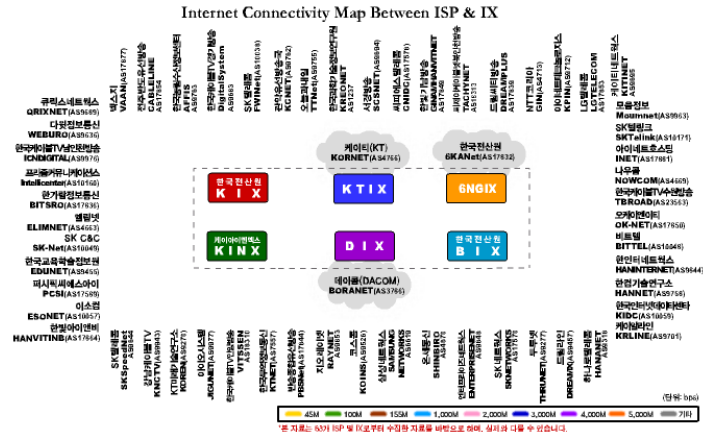
❖ Network Testbeds for Future Internet

❖ Future of Future Internet in Korea



Internet in Korea

- ❖ Internet Users : 34.4 M
- ❖ Broadband Penetration
 - 93% (1st worldwide)



Fundamental Technologies for Future Internet

❖ R&D Planning (through Future Internet Forum)

- Identify long-term R&D topics
- Predict the future technologies
- Promote collaborations

❖ Work on selected research topics (universities)

- Architecture
- Wireless
- Services

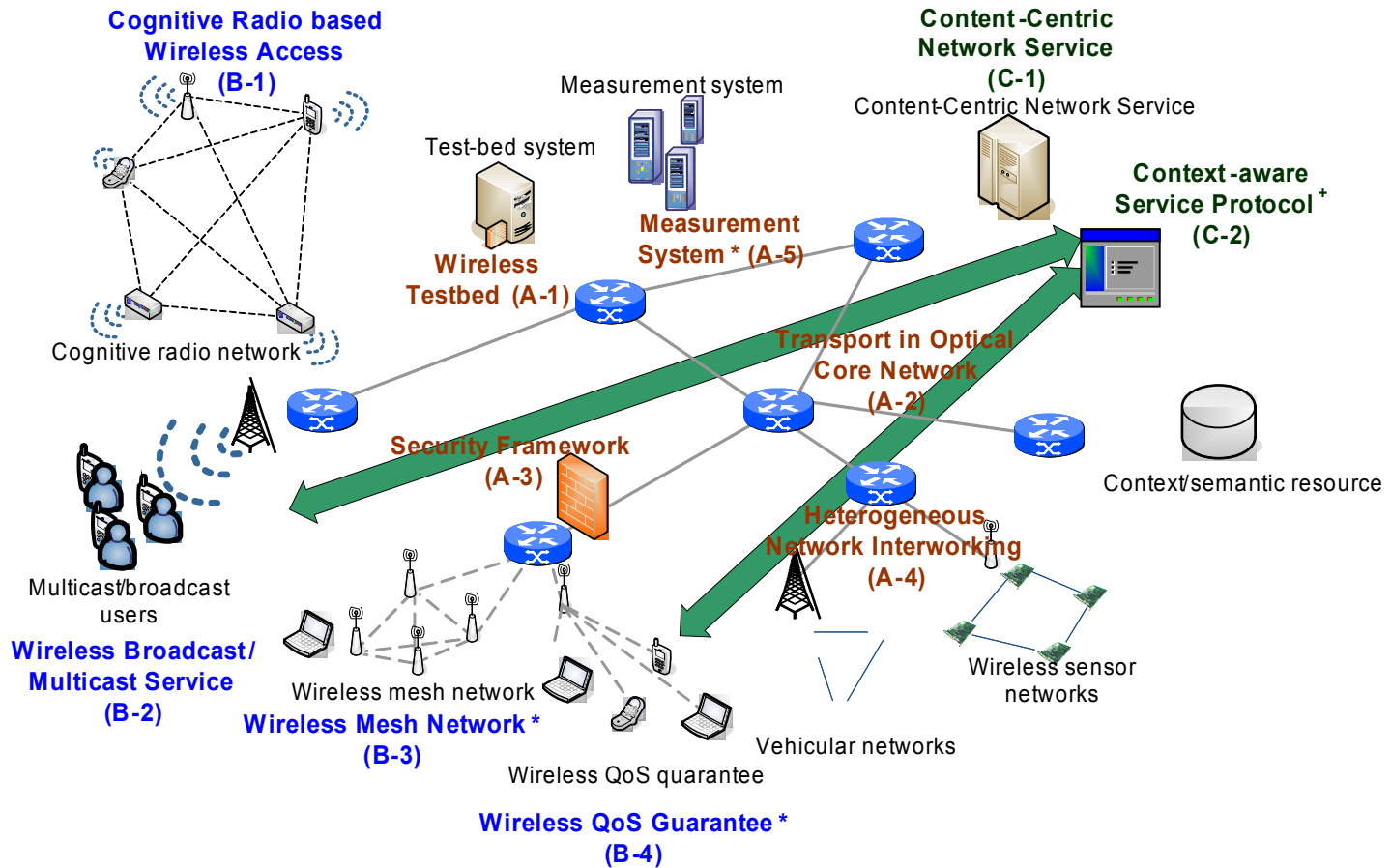
❖ Participation to Standard Activities

- IETF, ITU, IEEE, ISO, forum etc.

❖ First R&D project on Future Internet

- ❖ 2007-2009 (3 years)

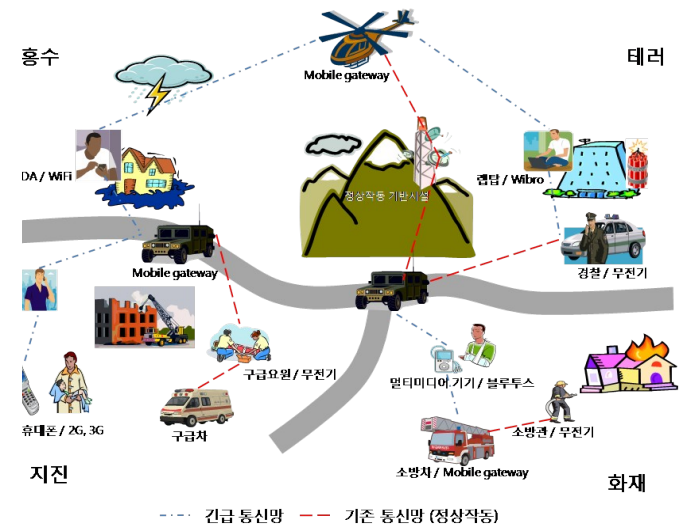
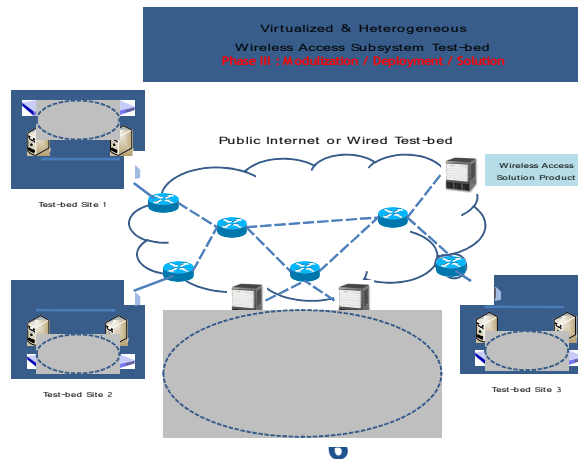
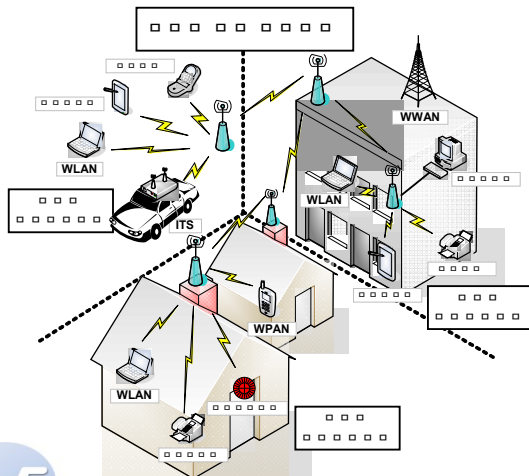
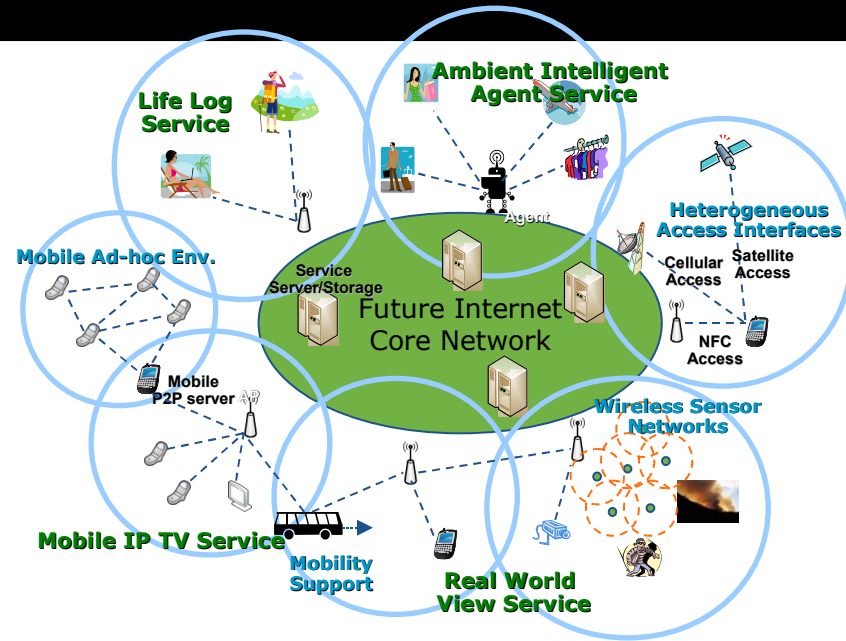




<p>Internet Architecture : A Wireless Access : B Service and Application : C</p>	<p>Seoul National University KAIST (*) ICU (†)</p>
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R&D Planning

- ❖ Big National R&D Program on FI
- ❖ Examples
 - Emergency Network
 - Mobile Service for the Future Internet
 - Heterogeneous Wireless Access Subsystem
 - Content-centric Network
 - Multi-hop Wireless Network



- ❖ Nov. 14, 2008 at SNU
- ❖ 17 demos presented



❖ Network Science and Engineering

- Focused on theoretical and practical models for Future Internet

❖ Participating organizations

- National Institute for Mathematical Studies ; **math** group
- Seoul National University ; **computer science** group
- Korea Advanced Institute of Science and Technology ; **physics** group

❖ Project funded and managed by Korea Research Council of Fundamental Science and Technology

❖ 2009 - 2014

Research Area : Complex Network

Understanding the Dynamics of/on Complex networks

Applying the understanding of complex networks to the Internet modeling

- ◆ Queuing system on the internet
- ◆ Load and centrality of modular networks synchronization on modular networks
- ◆ Information-propagation on social networks and human dynamics

Understanding structure-dynamics relationship in complex networks

- ◆ Queuing system on the internet
- ◆ Random walks on modular networks
- ◆ Epidemics and information-propagation on social networks

Investigating structure-dynamics relationship in complex networks

- ◆ Traffic control in complex networks
- ◆ Structure and dynamics of modular networks
- ◆ Structure and dynamics of social networks
- ◆ Structure and dynamics of bio-networks

Center for Next-generation Network & Services research

❖ Missions

- Develop network design methodologies for Future Internet
- Propose frameworks for advanced Future Internet services
- Develop network access methods using diverse wired and wireless network techniques
- Train highly competitive ICT experts
- Foster industries related to future networks

❖ Established in 2008 at Seoul National University

- Prof. Chong-kwon Kim
- 14 professors from six universities in Korea
- About 100 graduate students



CENNS Research Areas

Networks and Protocols

- Addressing scheme to support scalability, mobility, and security
- Virtualization over Multi-Core Systems
- Optical network at Tera/Petabit speed
- New Transport Protocol for QoS guarantee, and easy management
- Tools for Network Performance Measurement and Evaluation

Service Technology

- Service Architecture for Massive number of Prosumers
- New Service Framework for Context-aware Services
- Efficient Content Search Technologies

Heterogeneous Wireless Access Methods

- Scalable and Flexible Wireless Sensor Network Architecture
- Adaptive MAC and Routing in Multi-network Environment
- Ad-hoc and Mesh Network in Internet
- Adaptive Wireless Transport Protocol for Mobile Multimedia Applications
- Integrated Programmable System Platforms for Wireless Network

Future Internet Platform Project

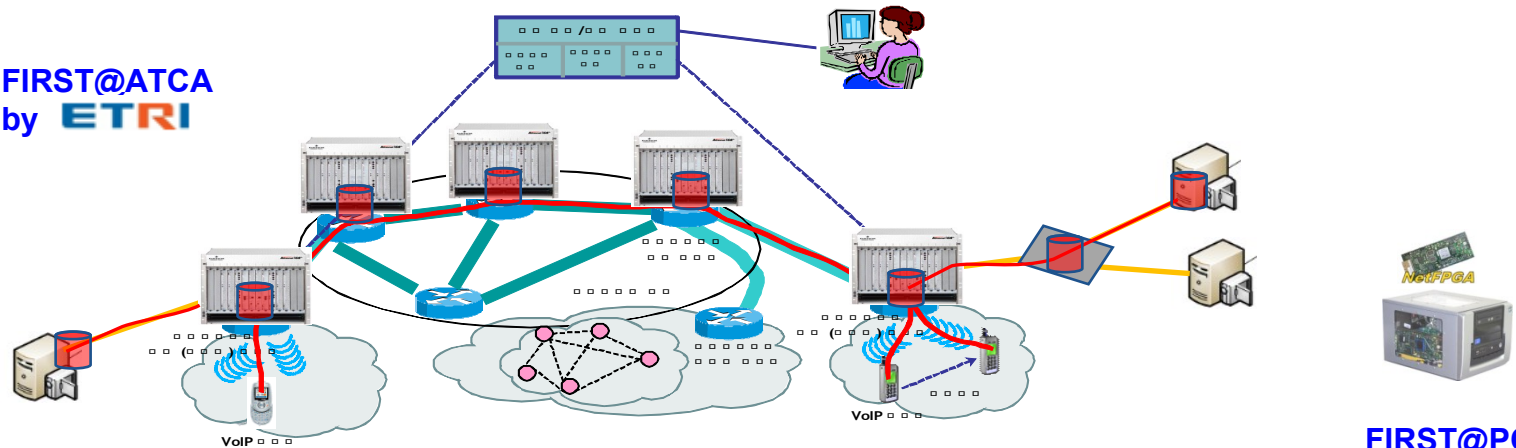
Development of the core technology and virtualized Programmable platform for Future Internet

❖ Goal

- Development of the core technology for **programmability** and **network virtualization**
- Development of the **platform technology** for realizing architectures and services of future internet



FIRST@ATCA
by ETRI



FIRST@PC
by GIST, CNU, KAIST,
PosTech, KHU

- ❖ Established in 2006 to promote R&D collaborations in Future networking
- ❖ Building research communities
- ❖ <http://fif.kr>
- ❖ Workshops, seminars, publications

- ❖ International Conferences (annual)
 - “Internet of the Future”, 2006
 - International Future Internet Workshop 2007
 - International Conference on Future Internet 2008
 - CFI 2009, June 17-19, Seoul, Korea
- ❖ Future Internet Camp (twice a year)
 - 2007 Aug. 20-22
 - 2008 Feb. 18-22 (with AsiaFI school)
Aug. 25-28 (with AsiaFI school)
 - 2009 Feb. 23-26, SNU
Aug. 24-28, Jeju, Korea



Future Internet Forum

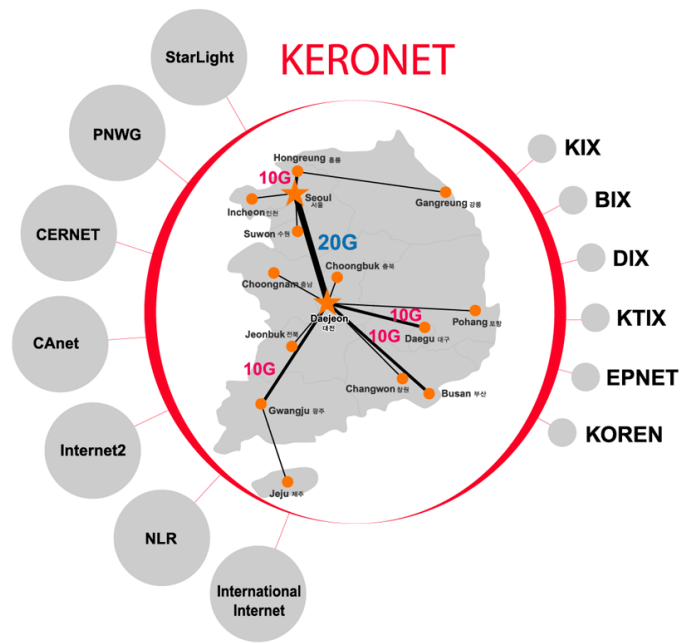


Network Testbeds

❖ KOREN



❖ KREONET



- ❖ **Open Research** : Experts from various sectors free to join
- ❖ **Selection & Concentration** : based on competitiveness
- ❖ **Global Cooperation** : Europe, CJK, USA
- ❖ **National Agenda** : Long-term big national initiatives

- ❖ Future Internet is a popular research area in Korea
- ❖ Many global cooperation programs
- ❖ Emphasis on **wireless**, **access** network technologies, and mobile **applications**
- ❖ **Open** platforms for network & terminal devices
- ❖ **Forum** is important to bring people together