Broadband Convergence Network Design

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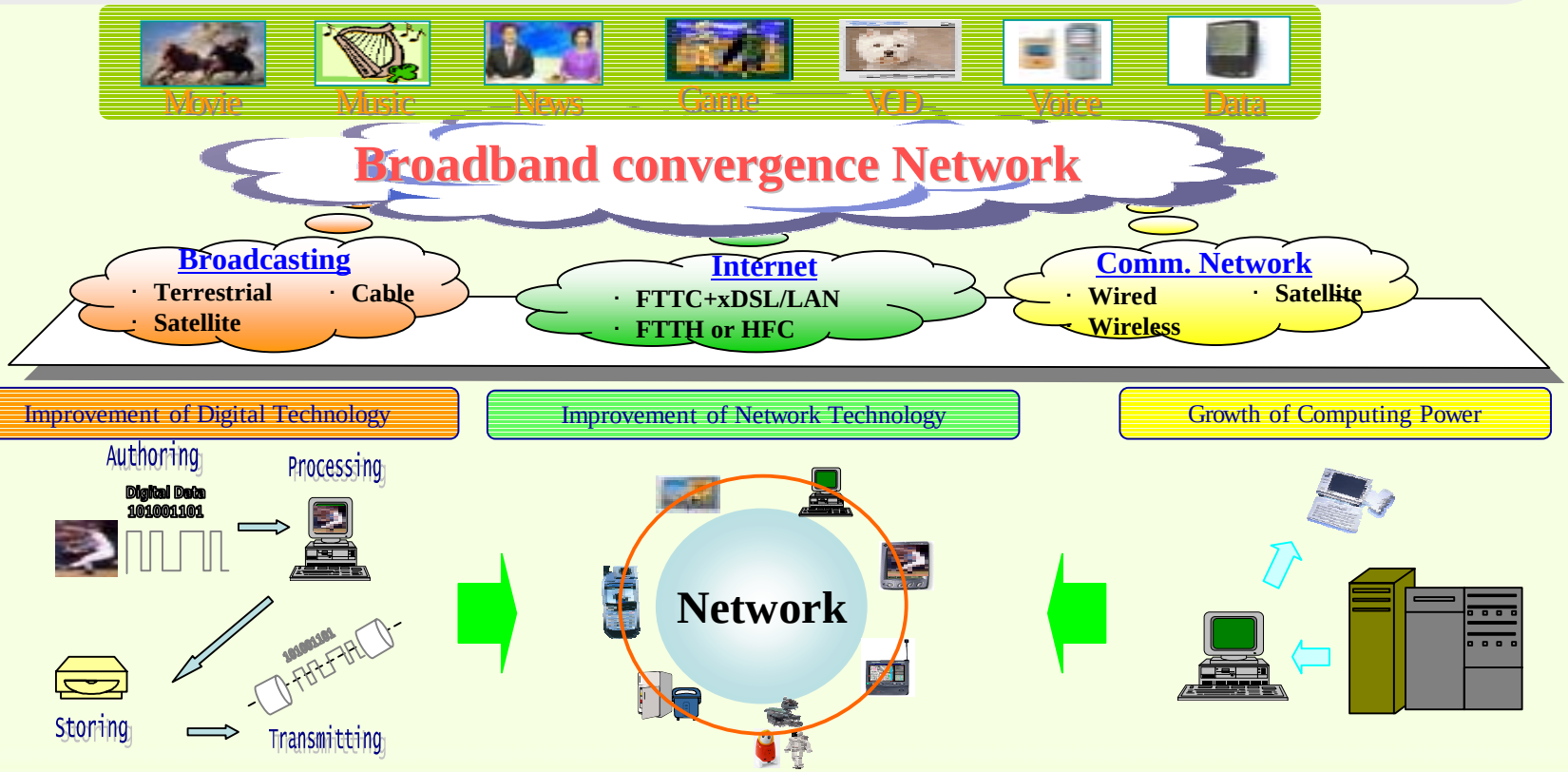
- Network Trend
- BcN Overview
- BcN Transport
- BcN Services
- Samsung’s BcN Solution

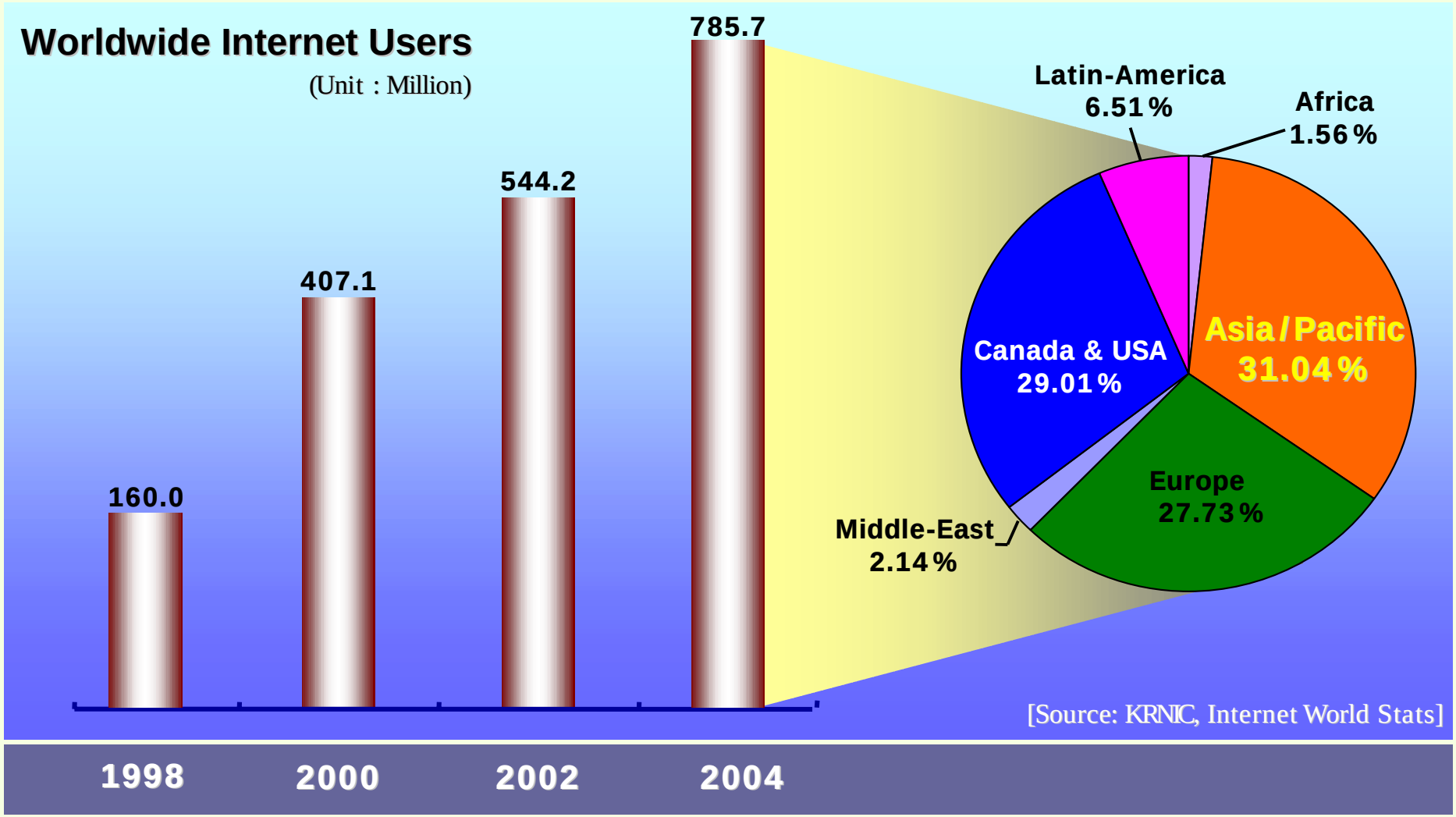
Paradigm Shift

Emerging Era : Integration of Comm., Broadcast and Internet

- **Digital convergence due to ...**
  - Digital technology improvement
  - Network technology and performance improvement
  - Computing power growth

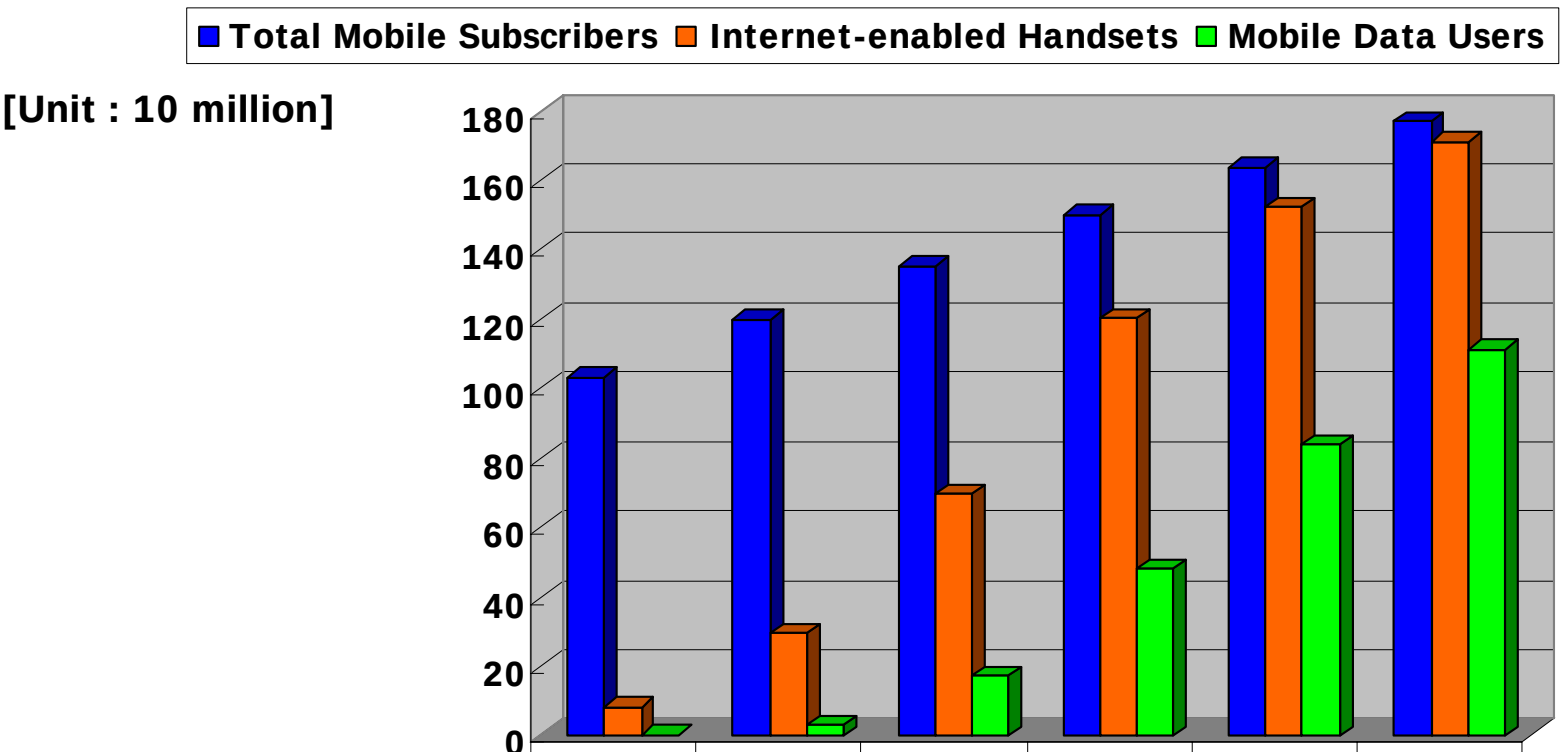


As a Result - Rapid Growth of Internet Users



Growing Potential due to Internet Multimedia !!!

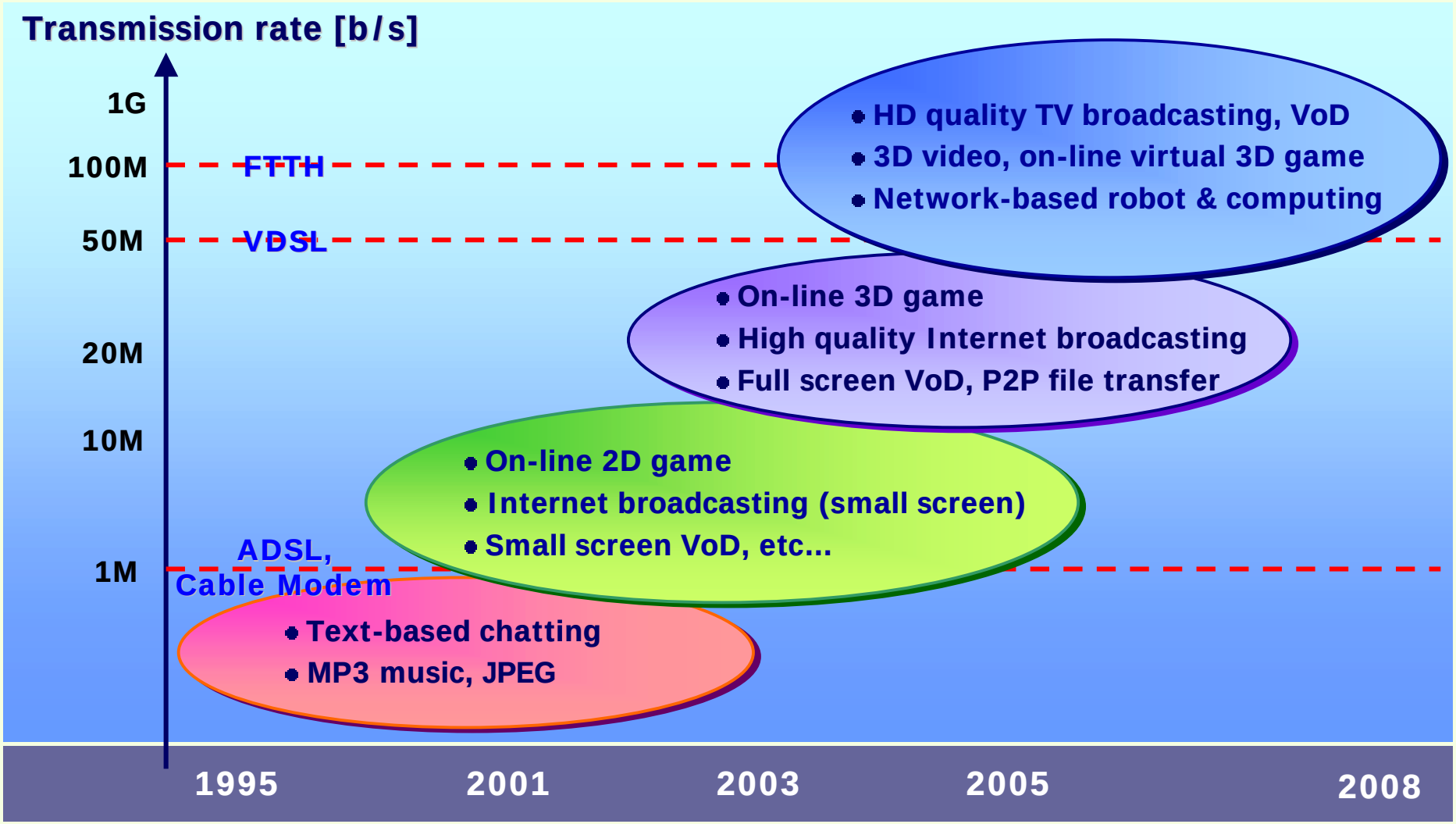
As a Result - Rapid Growth of Wireless Users



	2000	2001	2002	2003	2004	2005
Total Mobile Subscribers	103.3	119.8	135.3	150.2	163.8	176.9
Internet-enabled Handsets	8.2	29.4	69.6	120.1	152.4	171.1
Mobile Data Users	0.3	2.9	17.4	48.1	83.8	111.2

Growing Potential due to Wireless Multimedia !!!

As a Result - Rapid Evolution of Services



Korean Government's Vision

The IT839 Strategy

8 New Services

- WiBro
- DMB
- Home N/W
- Telematics
- RFID
- W-CDMA
- Terrestrial DTV
- Internet Telephony (VoIP)

3 Infrastructures

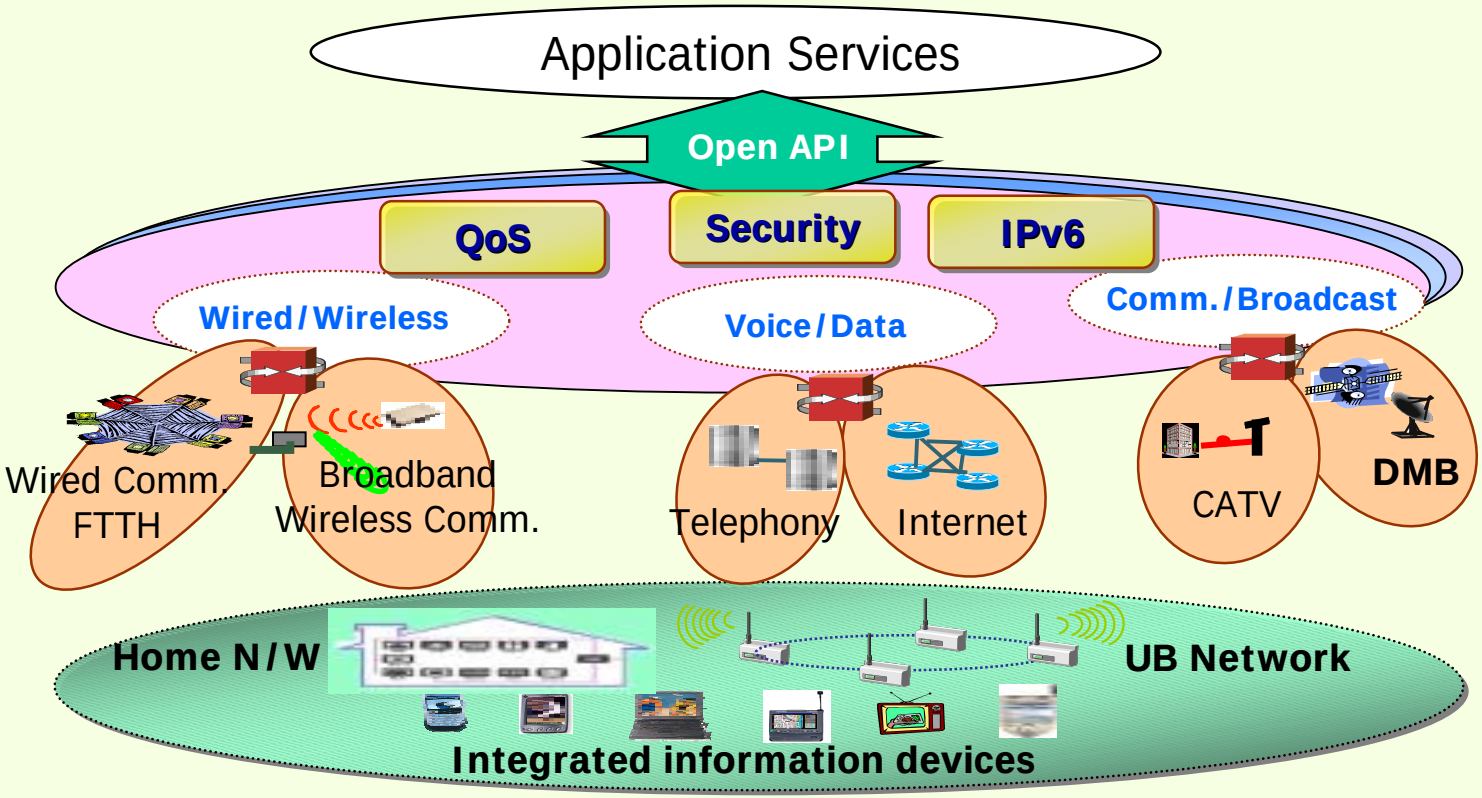
- **Broadband convergence N/W (BcN)**
- Ubiquitous Sensor N/W (USN)
- IPv6

9 IT New Growth Engine

- NG Mobile Communication
- Digital TV
- Home N/W
- IT SoC
- Next-Generation PC
- Embedded S/W
- Digital Contents
- Telematics
- Intelligent Service Robot

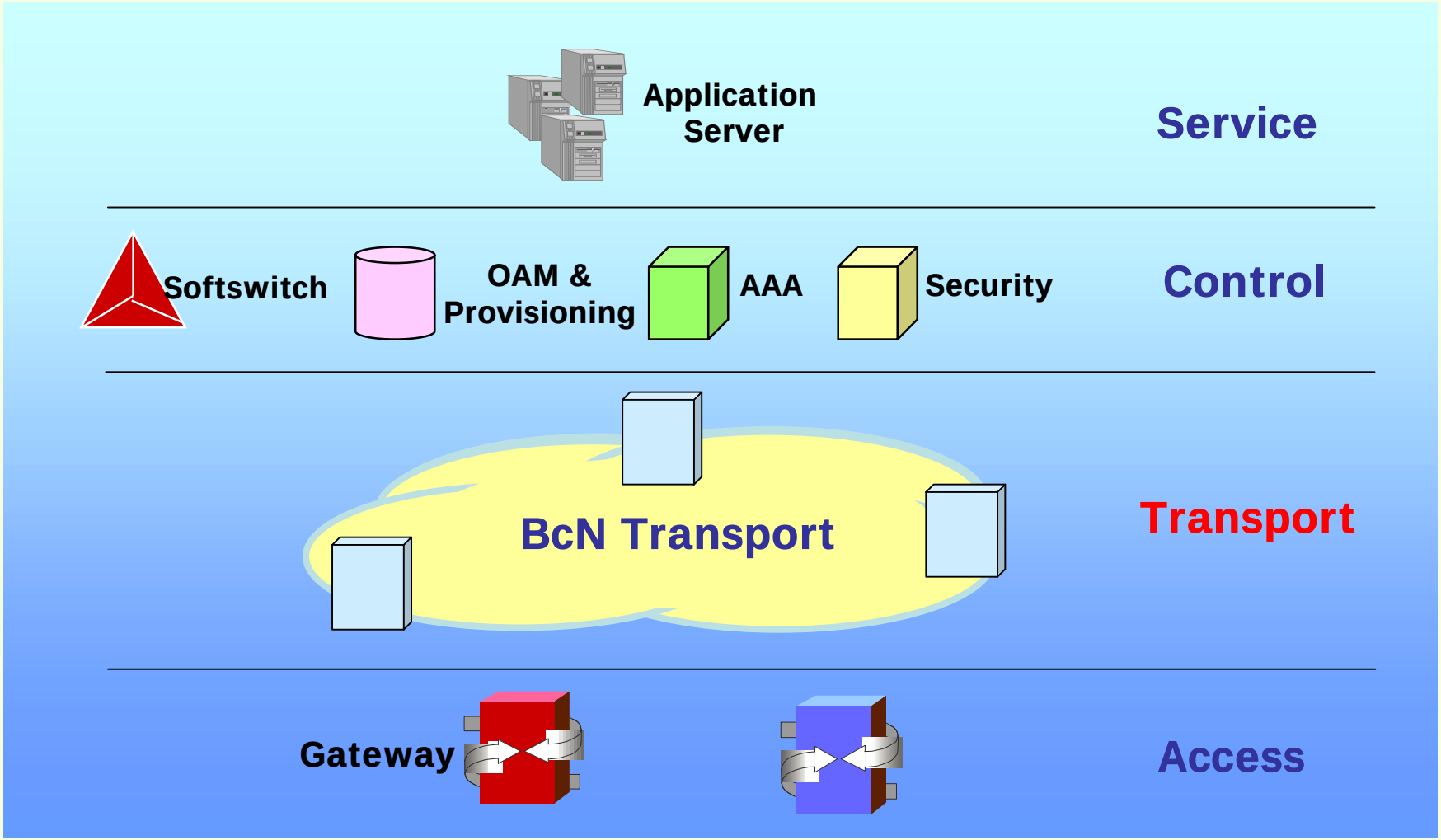
BcN Concept

Next generation converged network which can provide QoS guaranteed communication and broadcasting services at anytime, anywhere and with any devices



BcN Architecture

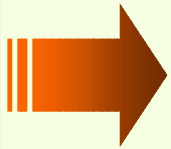
BcN layered architecture



Present Transport Issues

Present

- **Service-dependent N/W**
  - Data/Voice, Wire/Wireless
  - Communication/Broadcasting
- **Not guaranteed QoS**
- **Not managed network**
- **Insufficient security**
- **Deficiency in IP address**
- **Insufficient revenue-generating services**



BcN

- **Converged network**
  - MPLS/GMPLS-based IP network
- **QoS guaranteed network**
  - Flow based end-to-end QoS
- **Managed IP networks**
  - SLA, flow, fault management
  - Perfect FCAPS
- **Network-based security**
  - Authorization/Authentication
  - IPsec, SSH, Cryptography
- **Deployment of IPv6**
- **Support new services for pay**

Key Factors in BcN Transport

QoS Guaranteed

Broadband

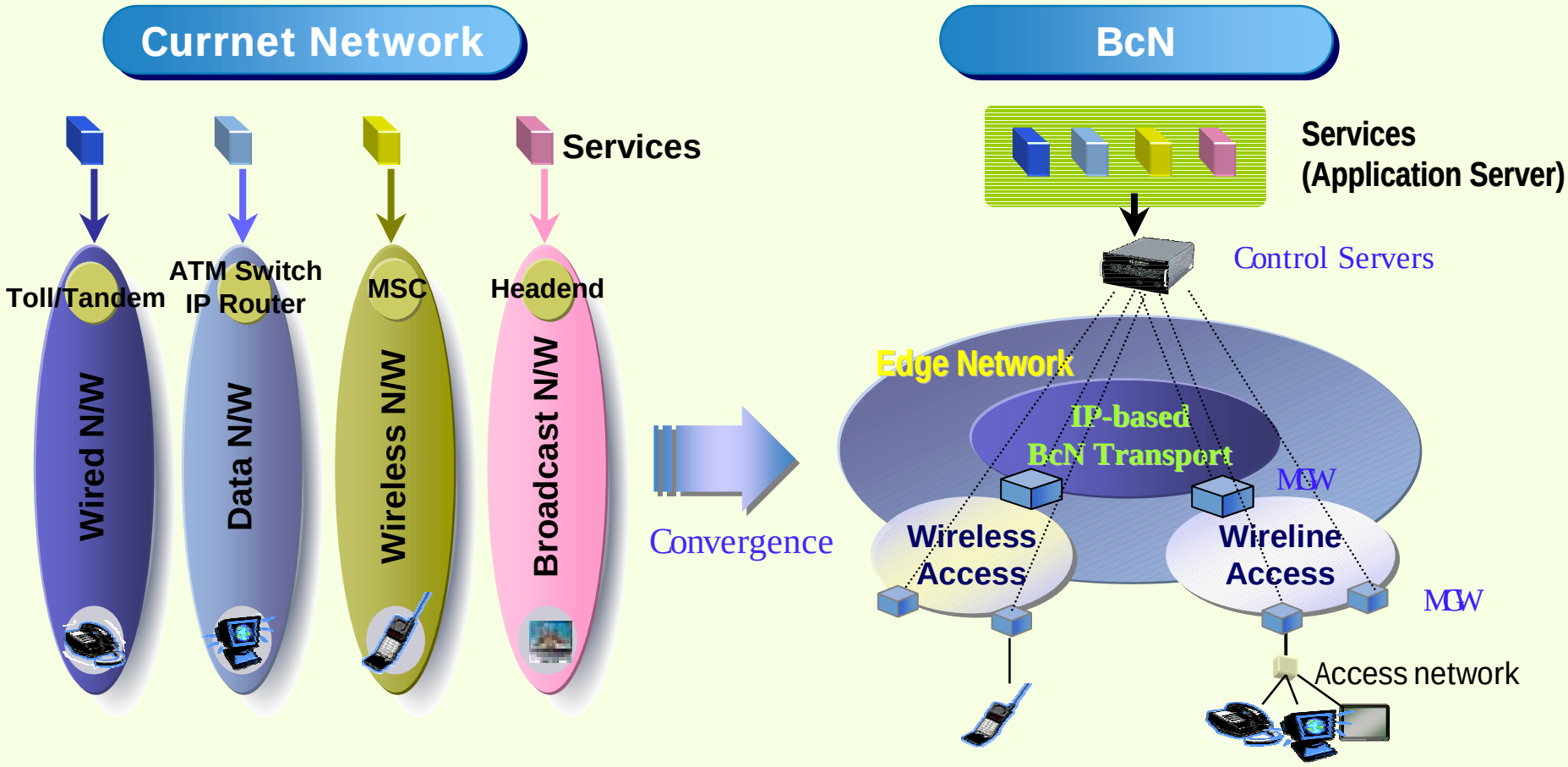
Manageable

BcN Transport

Converged Network

Secure

Requirement of BcN Transport - Convergence

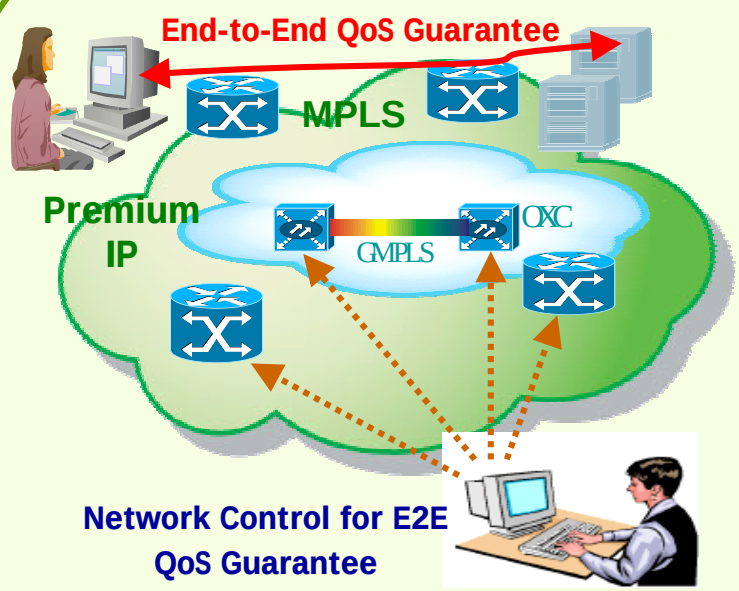


Separated Network per Services

IP-base Converged Network

Requirement of BcN Transport - QoS

End-to-End QoS Guaranteed BcN Transport

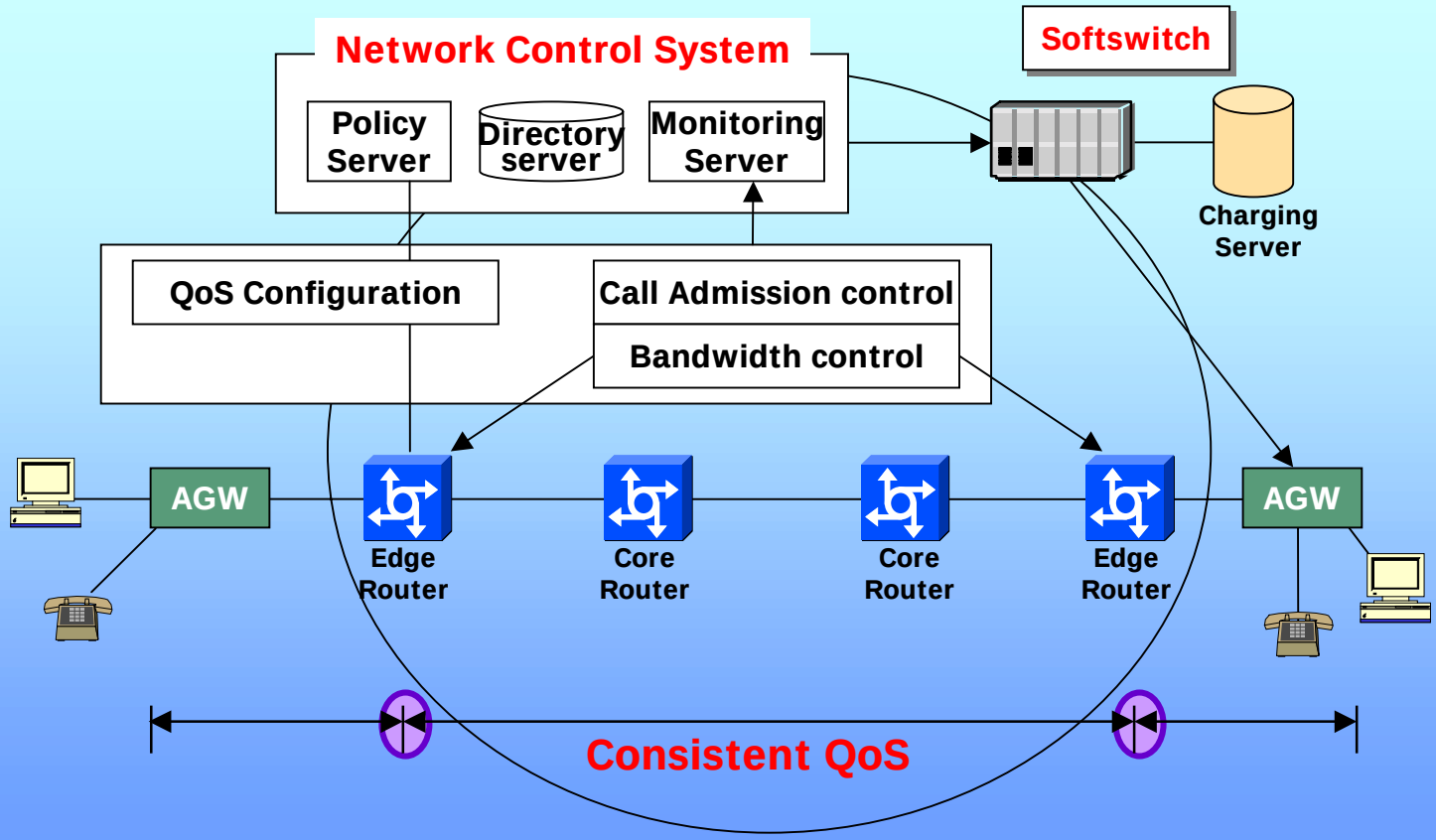


End-to-End QoS Guaranteed Network

- **QoS guaranteed premium BcN transport network**
  - Based on MPLS/GMPLS
- **Broadband optical transport network**
  - Deployment of OXC
- **Efficient QoS, SLA, traffic, billing management network**
- **Traffic engineered and traffic monitored network**

Requirement of BcN Transport - QoS

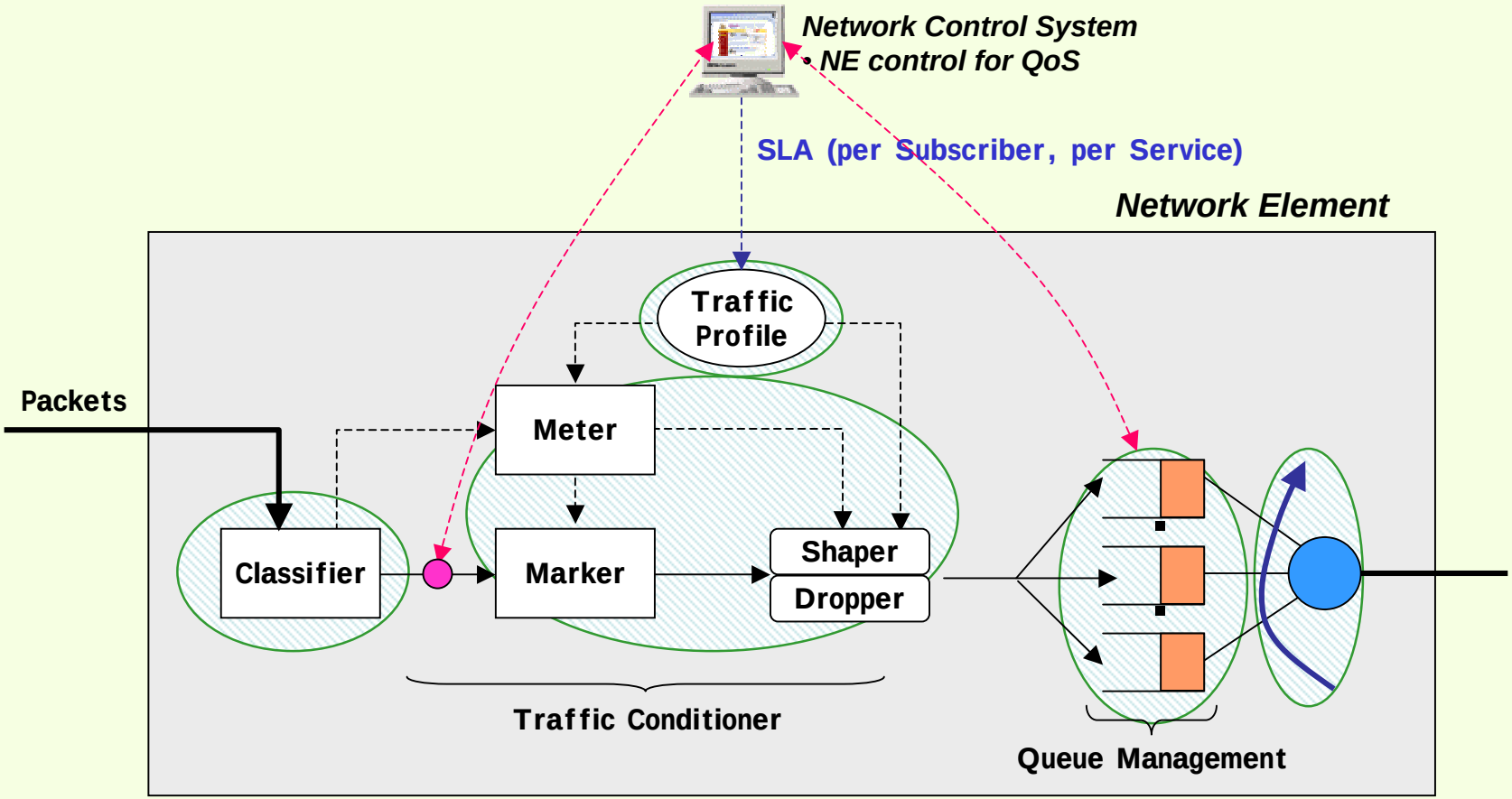
End-to-End QoS Controllable Network



End-to-End QoS Control through Management System

Requirement of BcN Transport - QoS

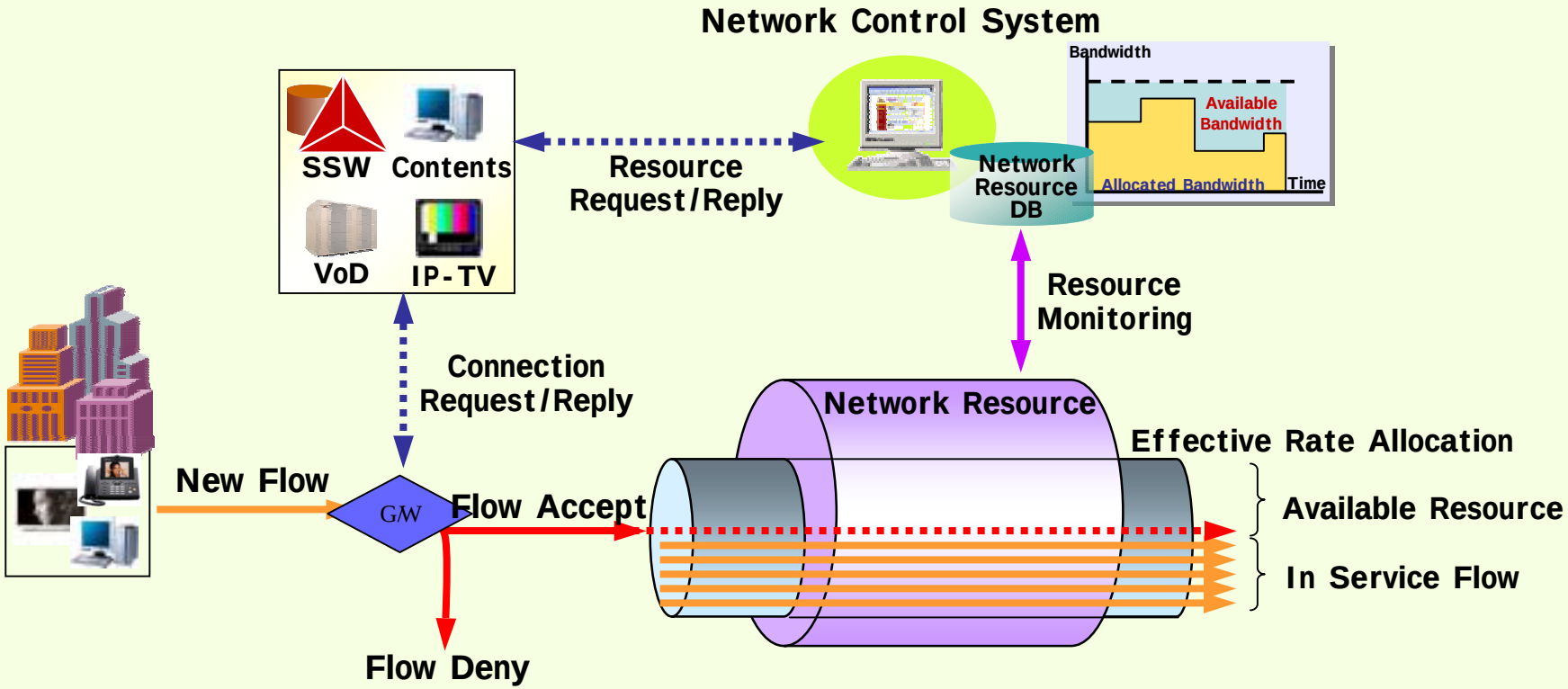
Network Element Control for Flow / LSP QoS



Classifier, Traffic Conditioner, Queue Control for QoS

Requirement of BcN Transport - QoS

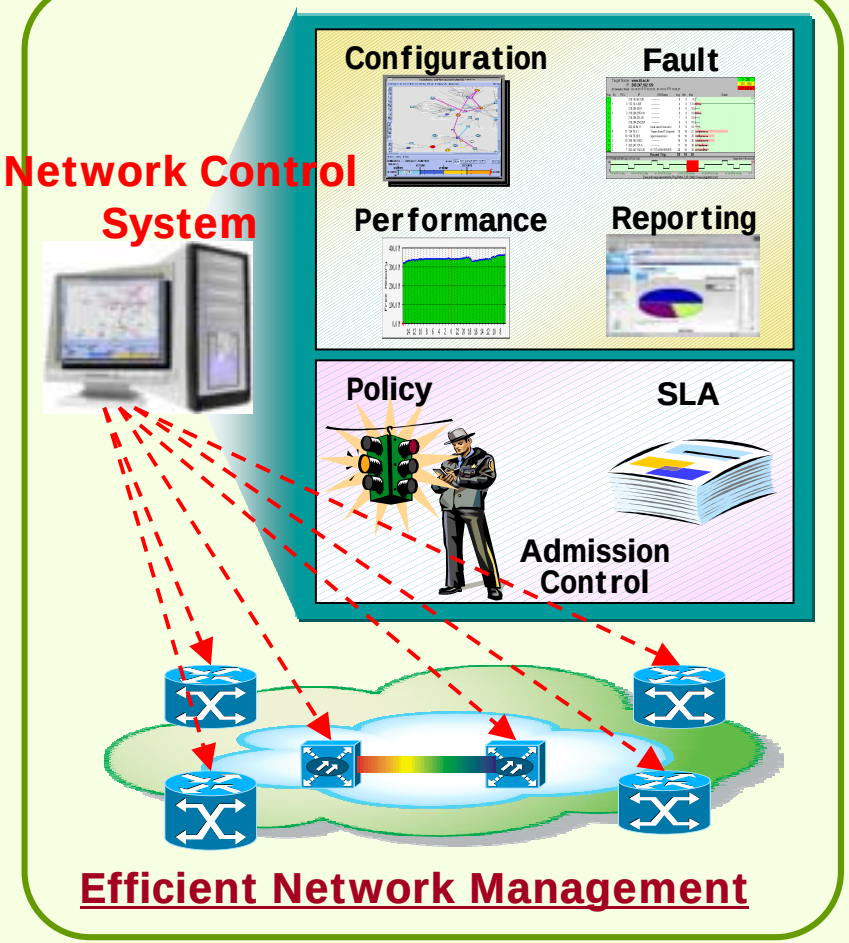
QoS Guarantee through Connection Admission Control



Accept or Reject the Requested Services based on Network Resource Availability

Requirement of BcN Transport - Management

Manageable Network through Centralized Control System

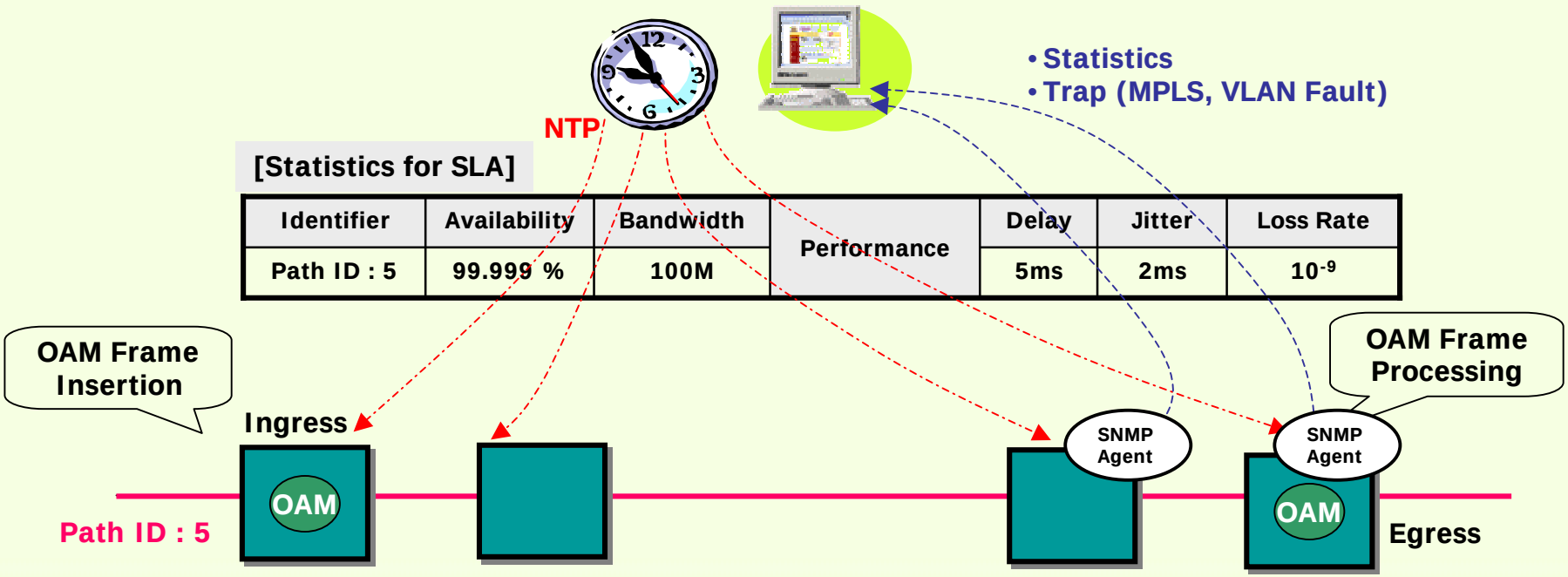


- **Configuration management**
  - Provisioning function
- **Performance management**
  - SLA monitoring
- **Fault management**
  - Network/Element failure
  - Protection/Restoration
- **Traffic management**
  - Traffic monitoring
  - NetFlow, cflowd
- **Policy management**

Requirement of BcN Transport - Management

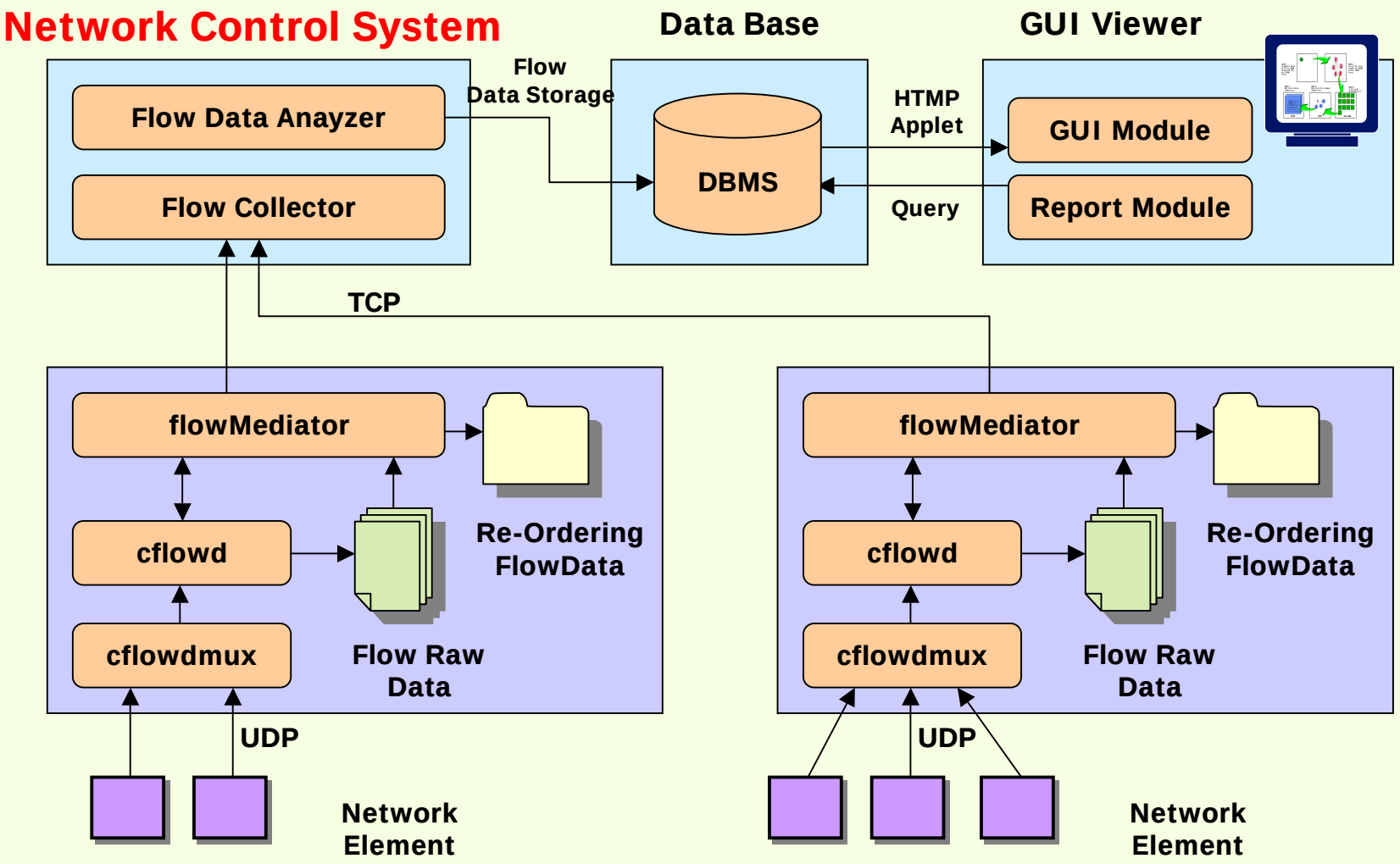
Performance Management through OAM

- **SLA parameters**
  - Availability (99.999 %), User request bandwidth
  - Delay, Delay variance, Loss rate
- **In case of performance degradation, protection/restoration may be occurred by network control system**



Requirement of BcN Transport - Management

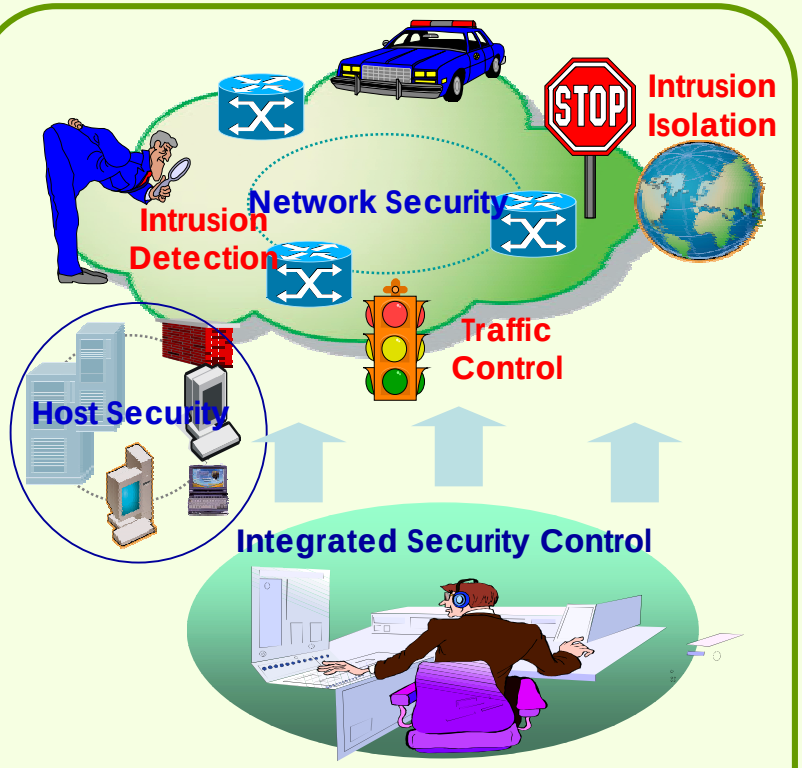
Traffic Management through Data Analysis : cflowd case



Requirement of BcN Transport - Security

SAMSUNG DIGITall
everyone's invited

Secure Network through Network-based Security

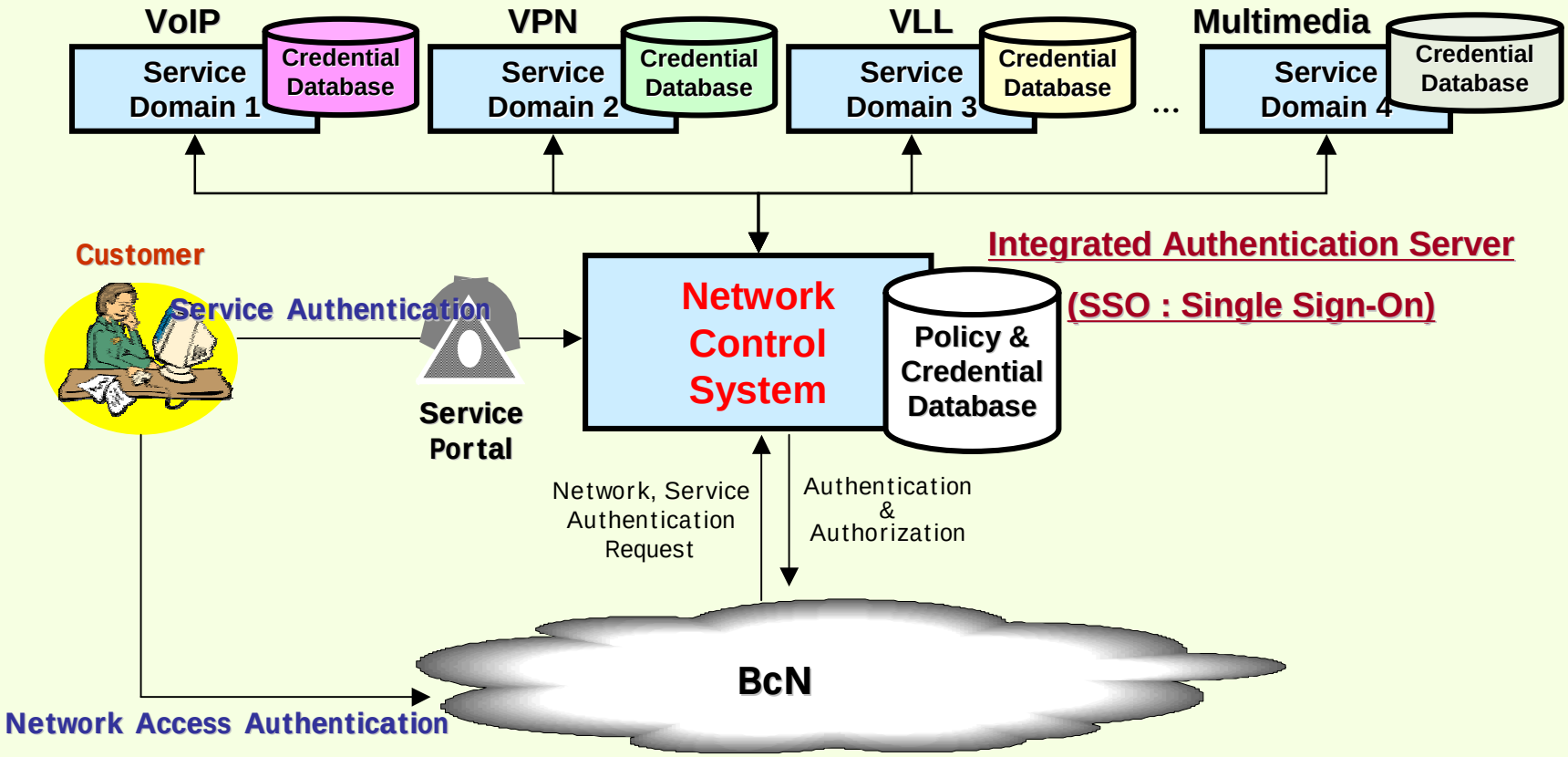


Network-base Security Control & Monitoring

- **Deployment of Network-based security**
- **Intrusion detection, isolation, and traffic monitoring by network control system**
- **AAA function**
  - Authorization
  - Authentication
  - Account
- **Traffic monitoring**
  - Detection of DoS, DDoS

Requirement of BcN Transport - Security

User Authentication through Network Control System



Requirement of BcN Transport - Services

Realize BcN World with Any-X solution

Any-X

Any Time

Any Where

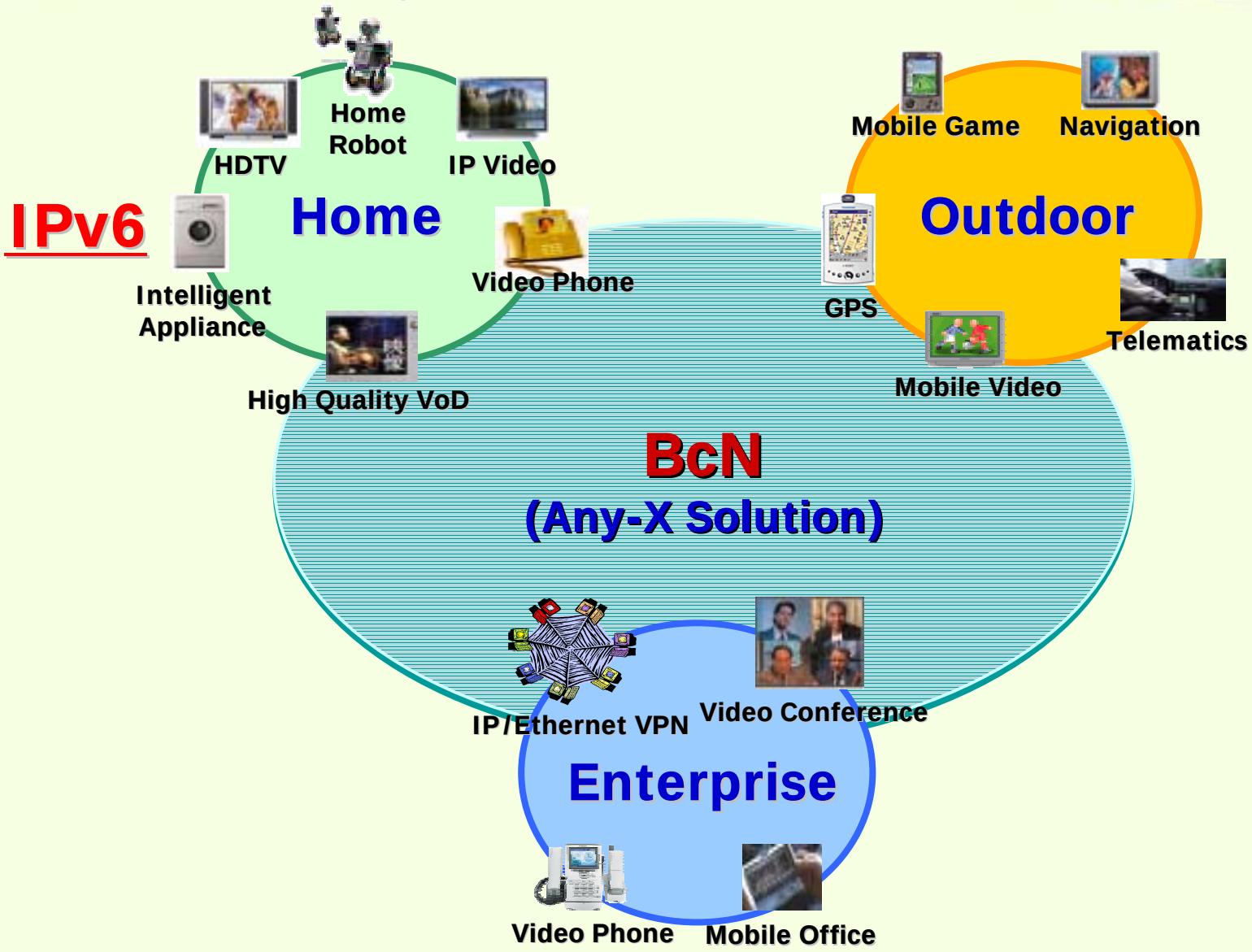
Any One

Any Device

Any Media

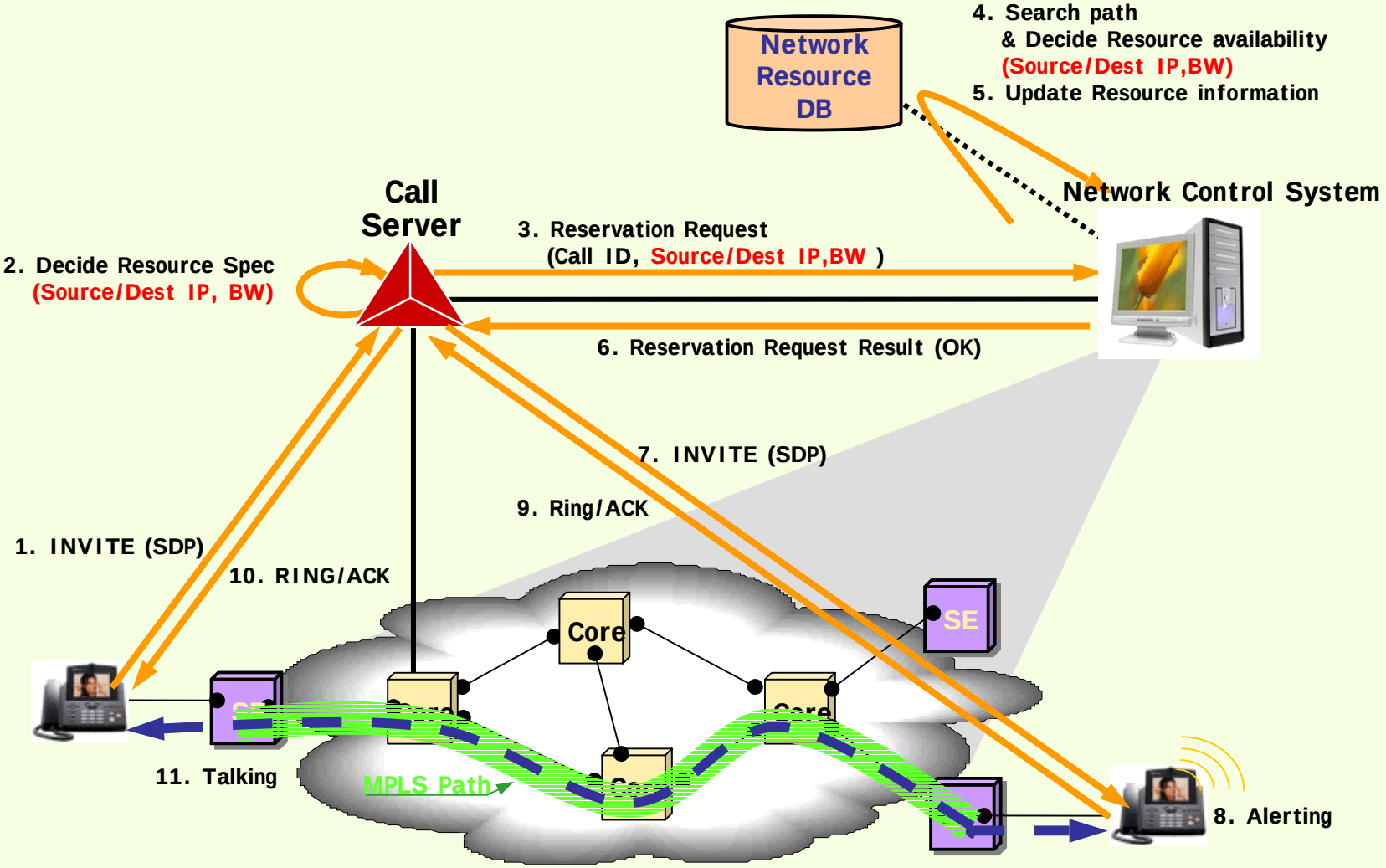
. . . .

Requirement of BcN Transport - Services



BcN Service Deployment – Video Phone

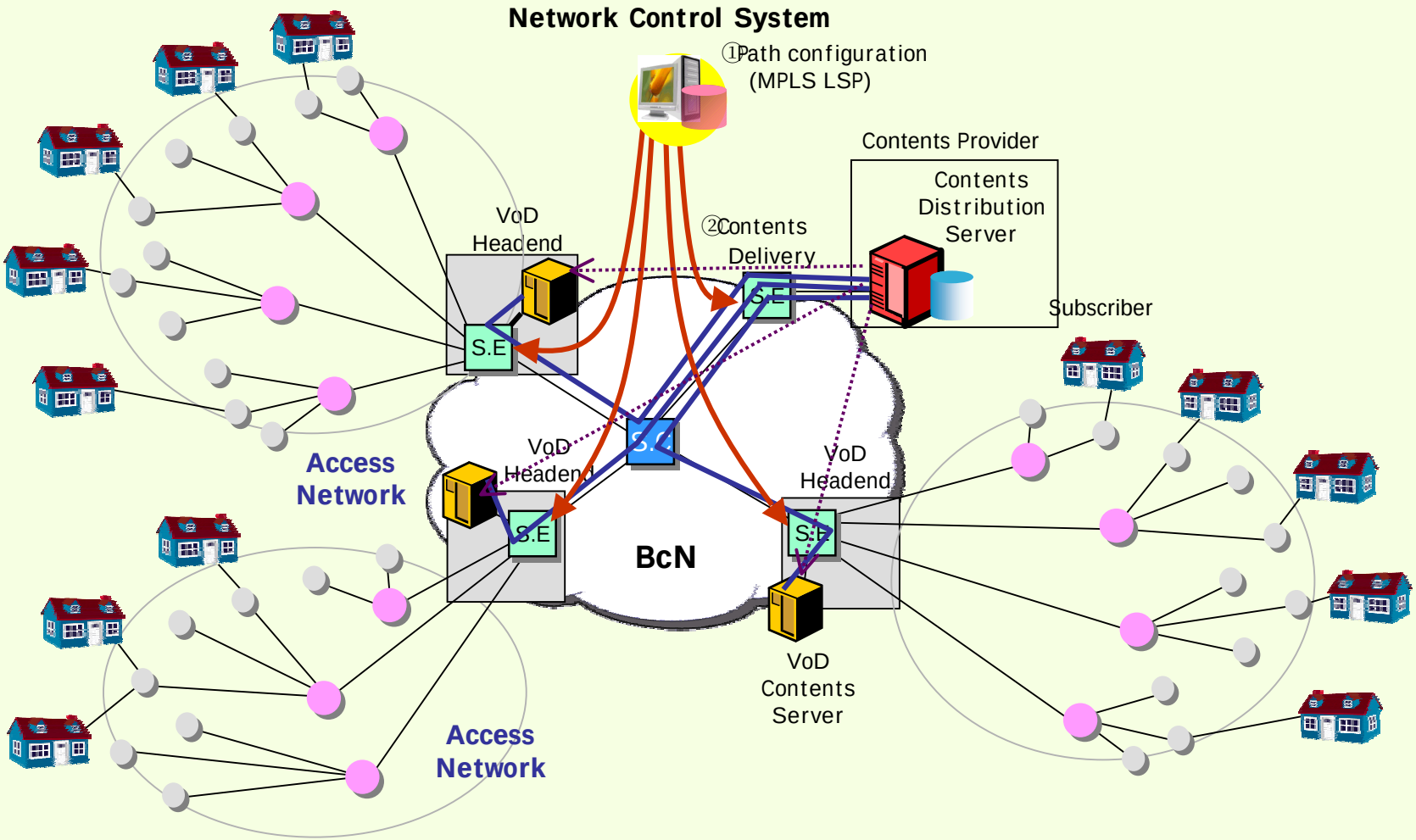
Video Phone Service Delivery through BcN Transport



BcN Service Deployment - XoD

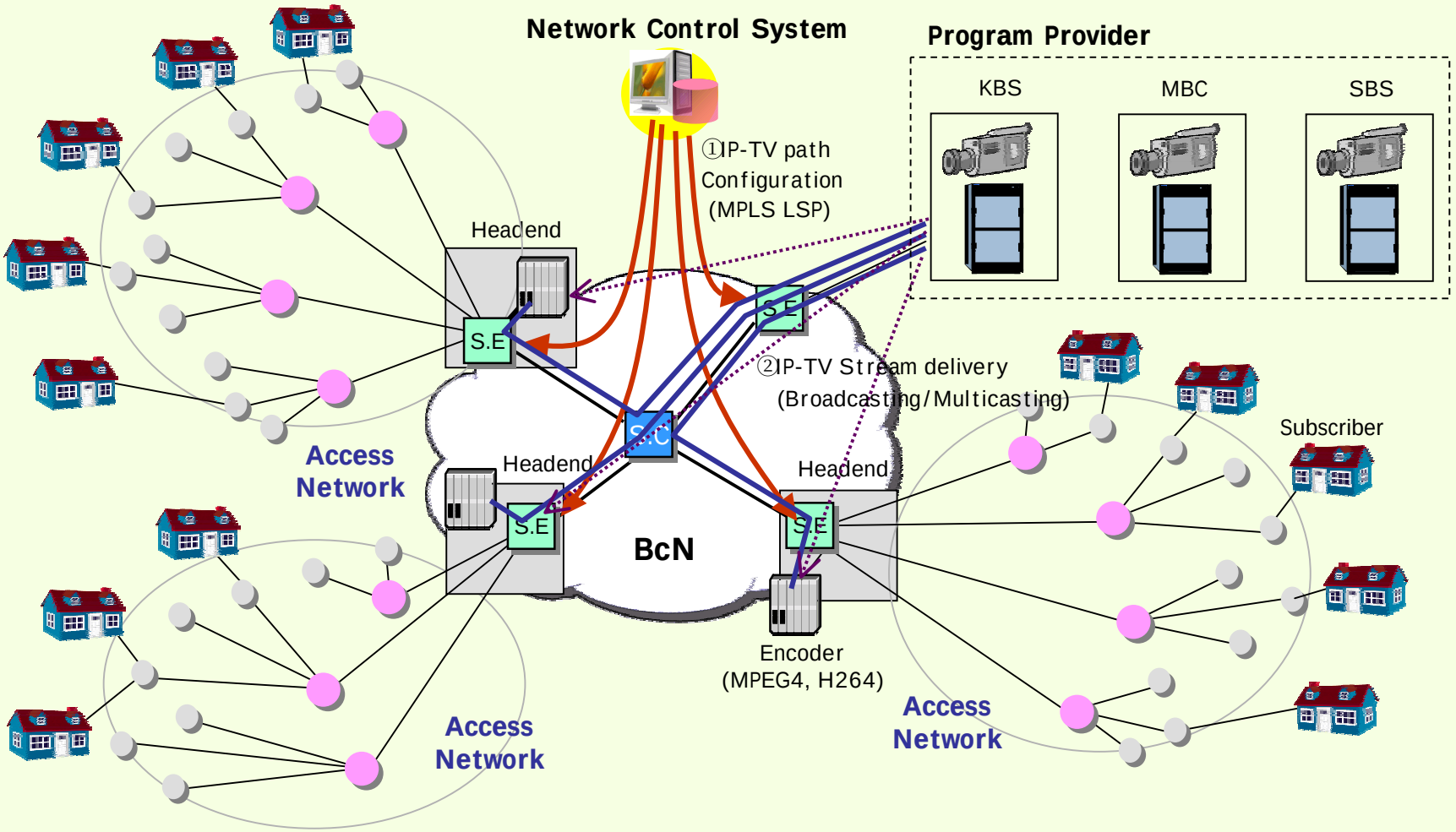
XoD Service through BcN Transport

XoD : VoD, EoD, etc...

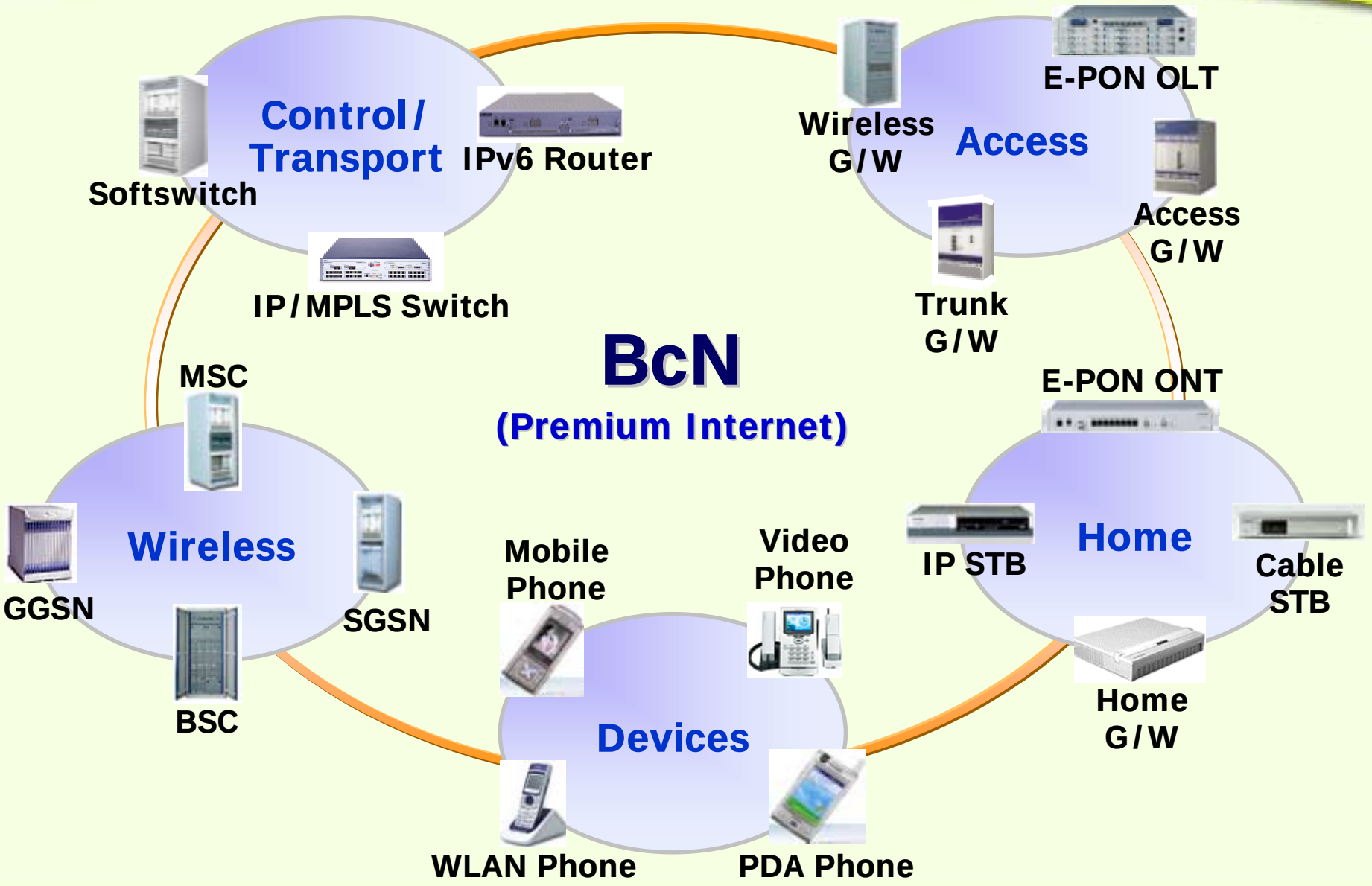


BcN Service Deployment - IP TV

IP-TV Service through BcN Transport



Samsung's Solution for BcN



Thank You !