Technical challenges in building the NGN - NTT's activities -

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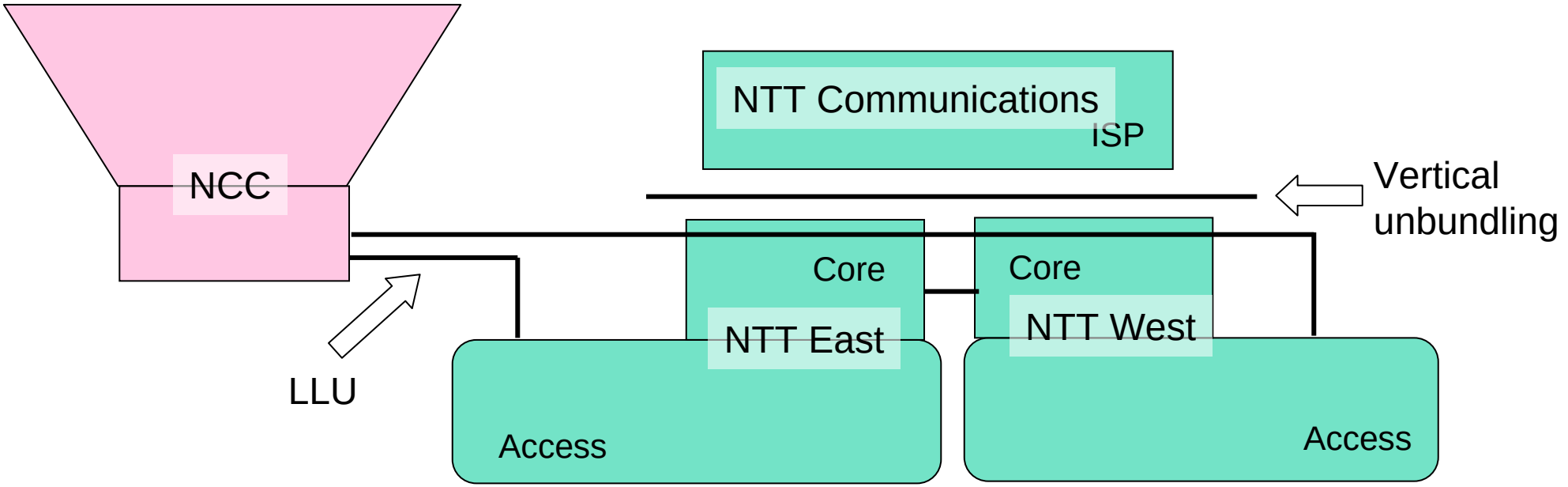
Decisions of technical choice on NGN

Background

- NTT's situations
  1. NTT R&D has been experimentally investigating VoIP using SIP for a long time.
  2. Before government's U-Japan Plan , NTT had been making efforts to spread fiber optics all over Japan.
- Regulator's (government) actions
  1. Mandate LLU (Local Loop Unbundling) at low interconnection charge
  2. Require high quality and emergency calls for 0AB-J (exsist telephone numbering) IP telephony
  3. U-Japan Plan calls for the spreading of FTTH all over Japan

Regulations governing the NTT group

NTT must provide its access network to NCC at a low interconnection fee.
NTT East and West are prohibited from providing ISP service, so NTT Communications provides it independently.
NCC can provide end-to-end service by using NTT's access network at a low price and take advantage of their vertical integration to provide ISP bundle service.



Internet telephone

- ISPs have provided IP telephony through the Internet as an additional service for their subscribers.

  Calls that terminate within the same ISP are free of charge.

  ISPs provide this service to increase their subscribers.
- To compete against ISP's IP telephony

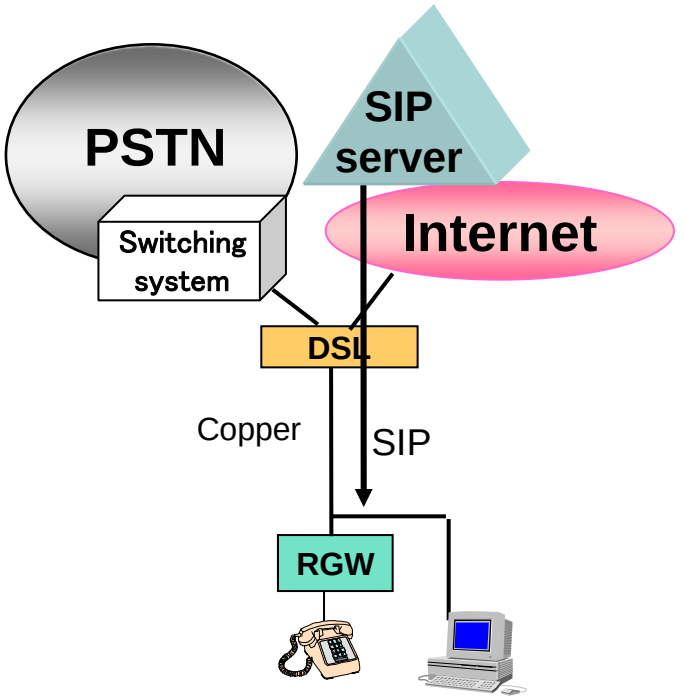
  NTT Communications, which owns an ISP called OCN, started IP phone service.

<u>Key decision</u>

Control protocol: H.248 vs. SIP

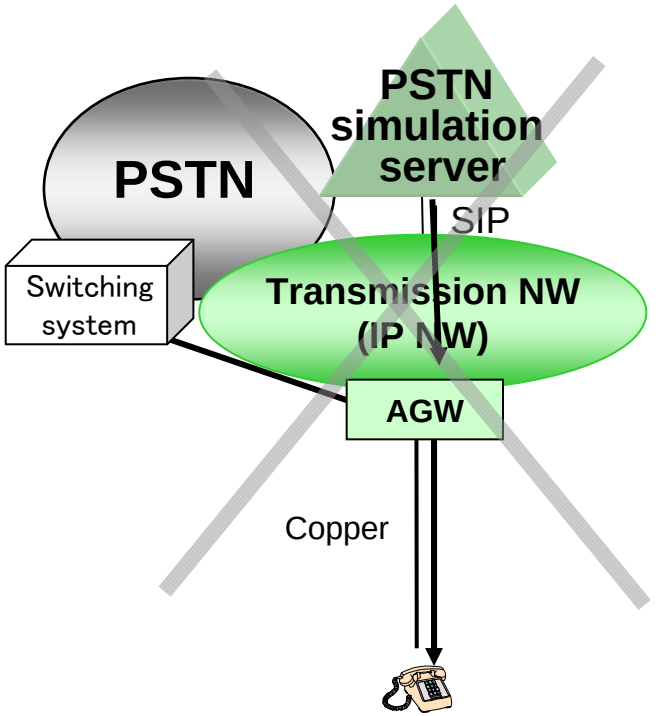
- H.248 allows only replacement of telephone service.
- SIP allows provision of broadband services as well as VoIP.

NTT selected SIP to promote broadband services.



IP telephony using LLU (not introduced)

- NCCs have been providing telephone service using LLU (called “dry copper”).
  They provide cheaper limited services of PSTN.
- To compete against them, NTT Communications, which provides long-distance service, was once preparing to provide a similar service.
  “The simulation server used in the Internet”
  + “AGW which has SIP interface”



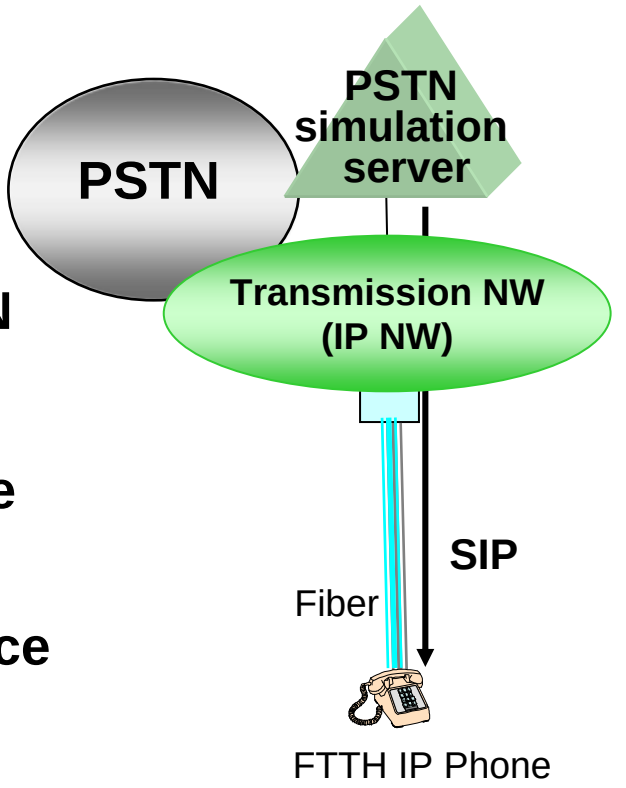
- “Because of cut-throat price competition, the market has been disrupted.
  Therefore, NTT Communications lost the opportunity to introduce it to the market.

Telephone service on FTTH

- LLU has disrupted the DSL and telephone markets.
  NTT has been investing in optical fibers for a long time.
- To compete against LLU telephony
  NTT reduced telephone price on copper
  NTT provided telephone service on FTTH

  <u>Key decision</u>
  PSTN evolution: emulation vs. simulation
  - Emulation, which provides complete PSTN services, only enables NTT to keeping revenue from PSTN.
  - Simulation allows NTT to increase revenue from broadband services.

  NTT selected simulation to shift revenue source from telephone to broadband services.



IP telephony based on the NGN

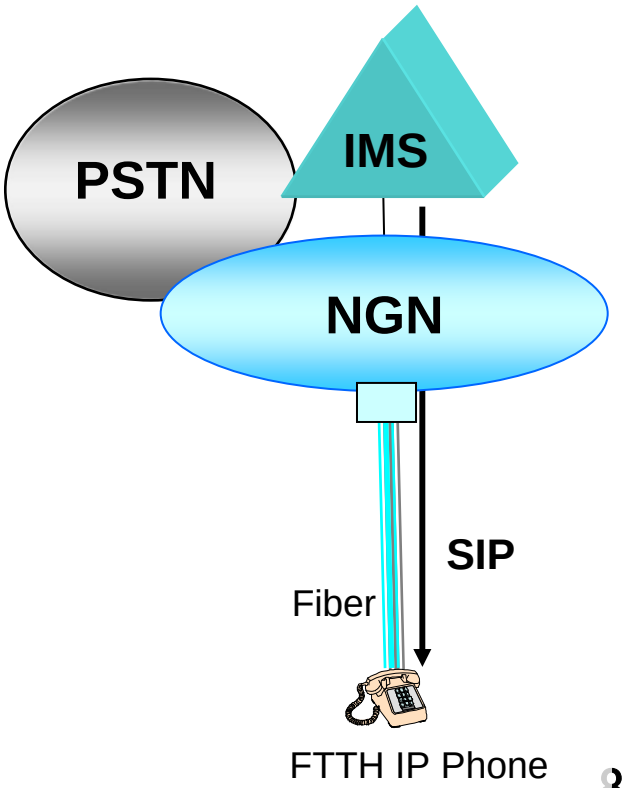
- **To maintain network infrastructure and strengthen competitive edge and financial base, NTT start building NGN.**

Key decision

Method for migration: replacement vs. overlay

- **Replacement keeps subscribers from moving to NCC.**
- **Overlay means growth, encouraging aggressive users to use broadband services.**

NTT selected overlay to create a new service structure and increase ARPU.



PSTN migration (future plan)

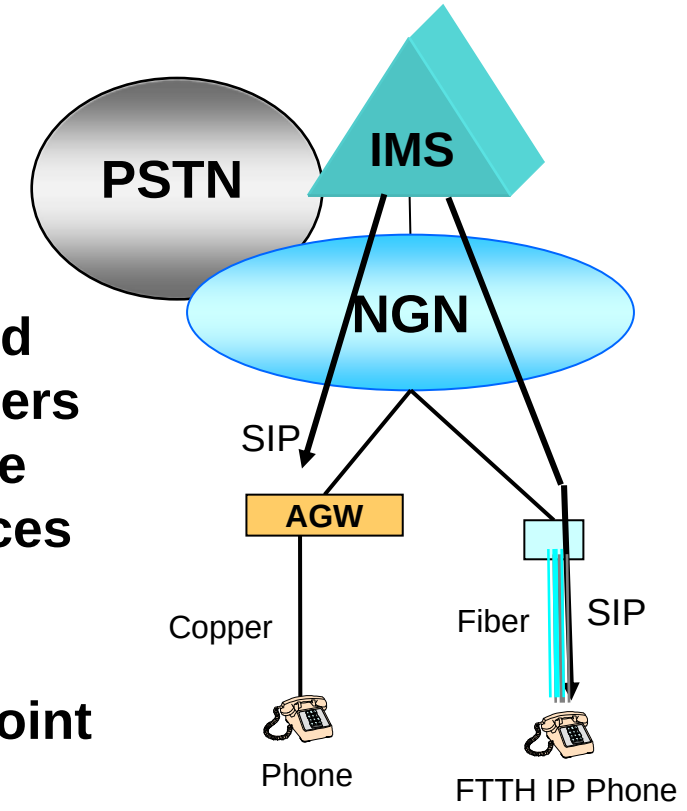
- **Expectations**
  - **The time will come to give up PSTN because there is limit to extending the lifetime of switching system.**
  - **Not all subscribers will move to FTTx before that time.**
- **NTT will have to provide “NGN + copper”.**

Key decision

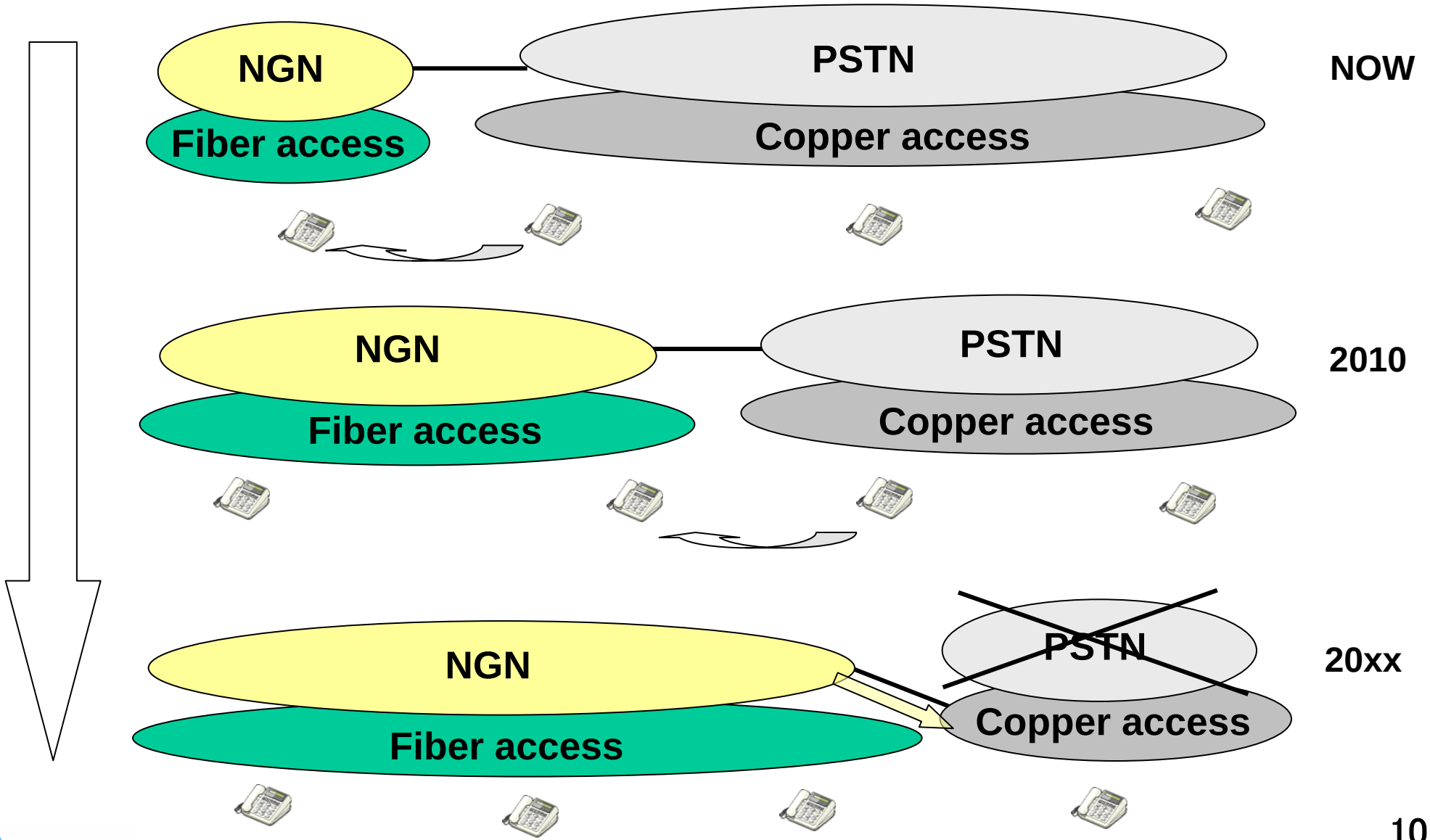
PSTN services:
keeping all services vs. replacement by new services

- **Keeping existing services means no need for negotiation with the regulator and users**
- **Replacement by new services can reduce maintenance costs and make NGN services universal services.**

NTT will start to build a consensus on this point with users and government.



Anticipated schedule for implementing migration



NTT's stance

- Japan's regulator promotes competition while at the same time encouraging NTT to spread its broadband network.
- NTT must both compete against competitors and maintain its nationwide infrastructure.
- NTT always make decisions that will bring it forward and step into a new telecom world rather than preserving the current situation and guarding its vested rights and properties.
- NTT keeps on demonstrating what will become possible and giving messages to customers, business partners and the regulator in order to build consensus about a potential new telecom world.

What NGN can bring us

Purposes for NGN

NGN ⇨ For strong financial base

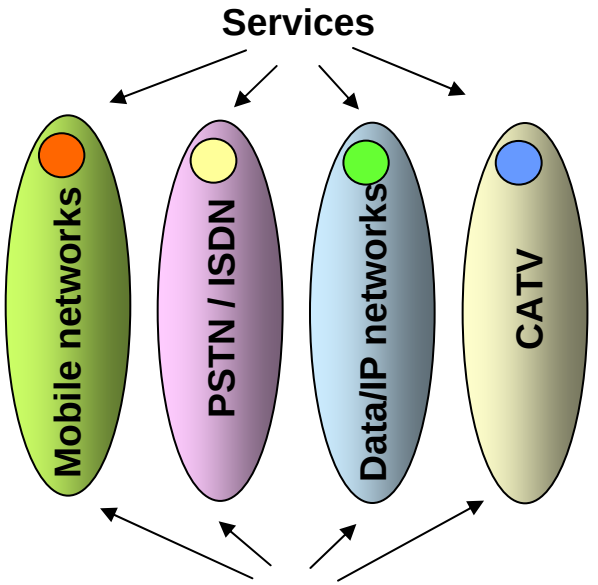
- **Network structure change** ⇦ ***Network Innovation***

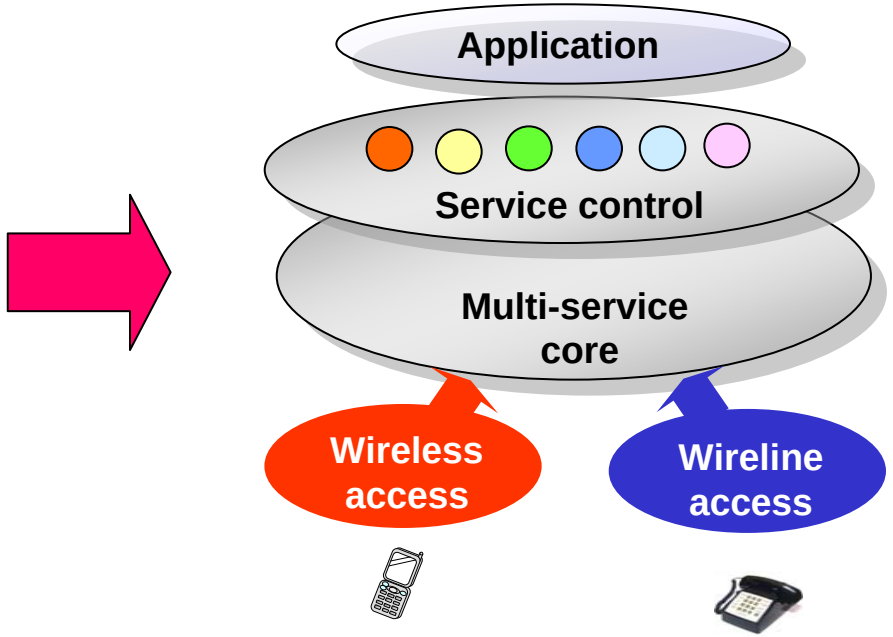
  Converged network, Intensive network for cost reduction – Capex and Opex

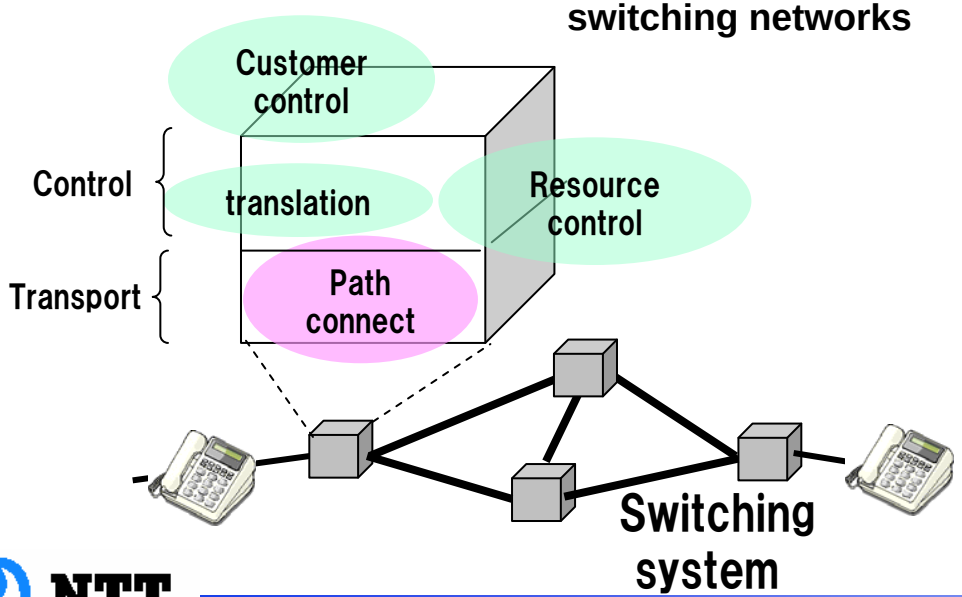
- **Service structure change** ⇦ ***Service Innovation***

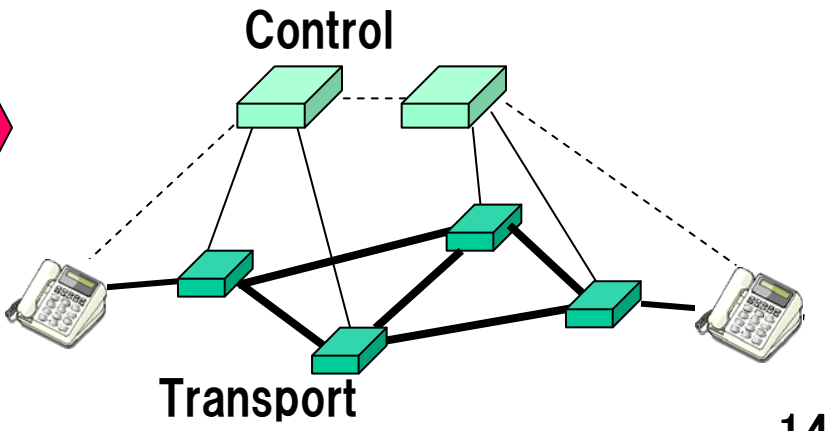
  Create new revenue structure for creating new market and revenue source

Network convergence & Intensive network

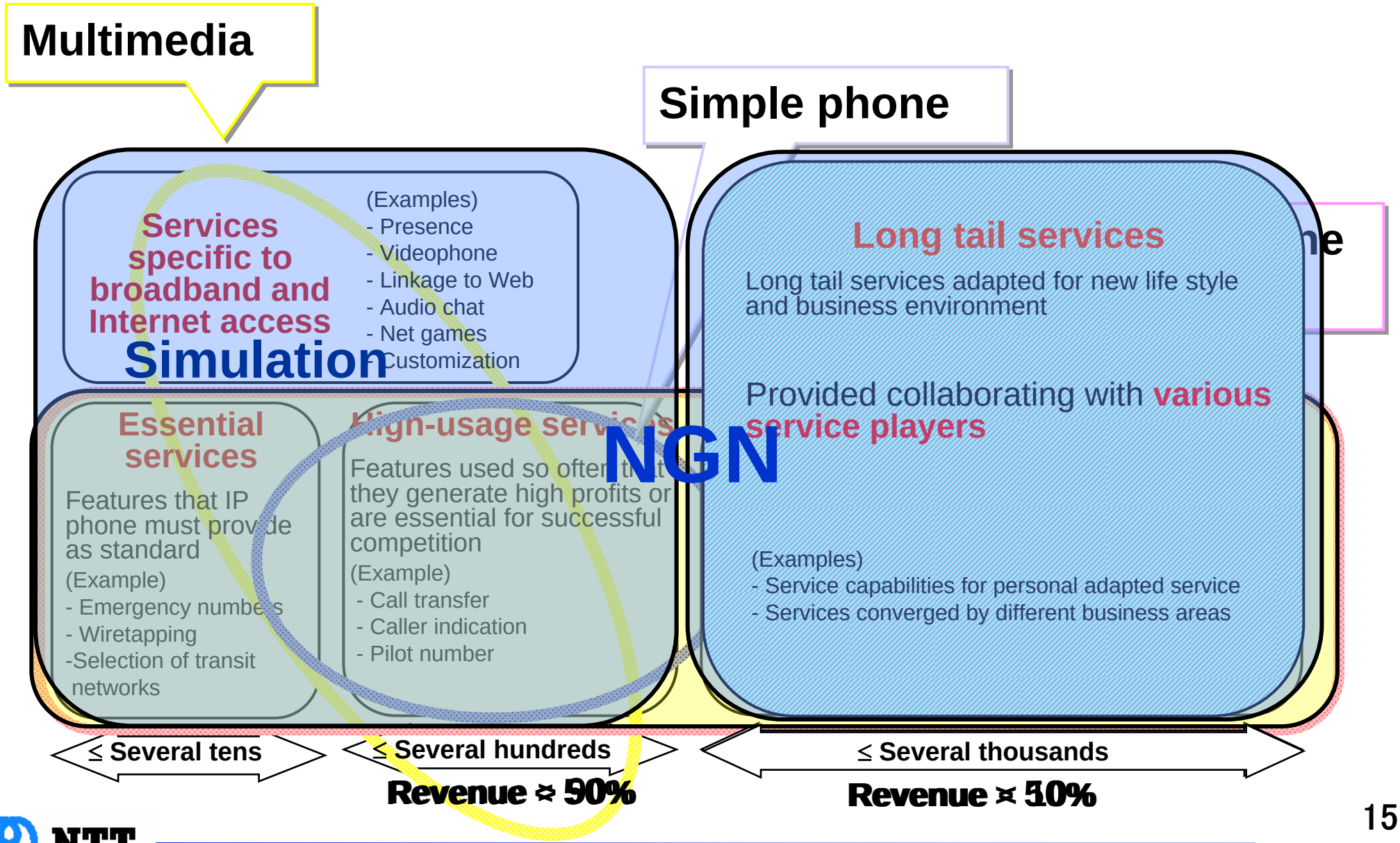








Telephone service structure

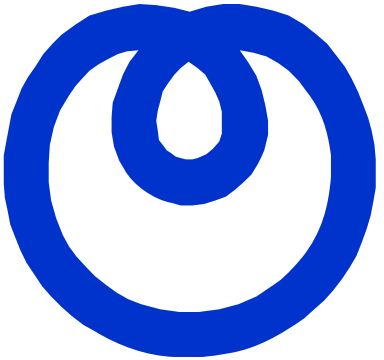


Global infrastructure for a new service structure

- Significant differences between Emulation and Simulation
  - Emulation keeps traditional services developed by each country. Therefore, it is “domestic” in nature.
  - Simulation defines “global standard” services, making it possible to achieve global interoperability.
- NGN brings an opportunity to build a new infrastructure based on global consensus.
  - NGN is a network innovation for a new age.
  - NGN brings service innovation and can lead to the establishment of a new service structure around the world.

- NTT hopes to share its new vision about what NGN can bring us with friends in the world and explore the new NGN world together.

Thank you



NTT