

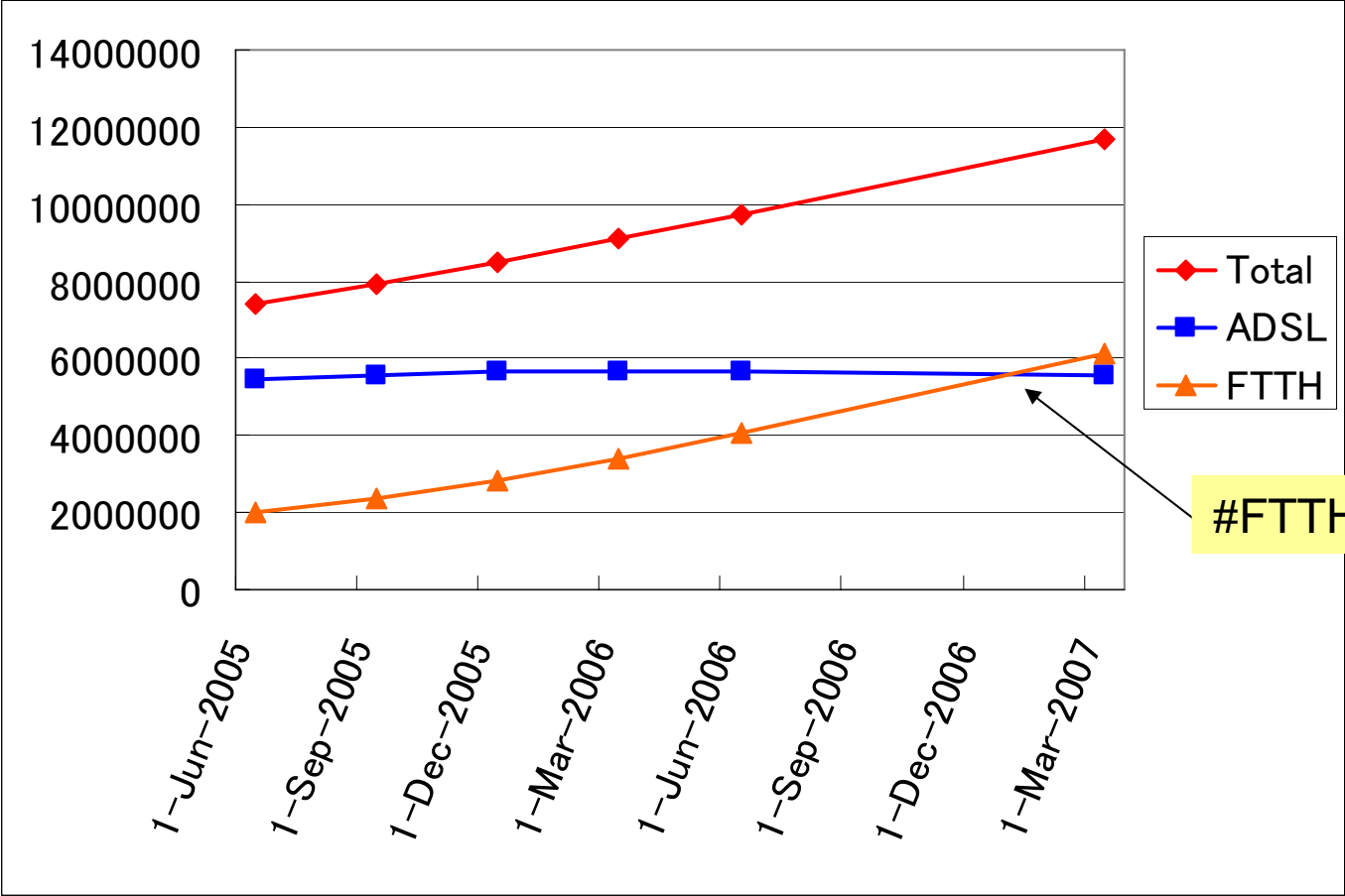
# NTT's OSGi Device/Gateway Management

- OSAP: OSGi Service Aggregation Platform -

NTT Laboratories

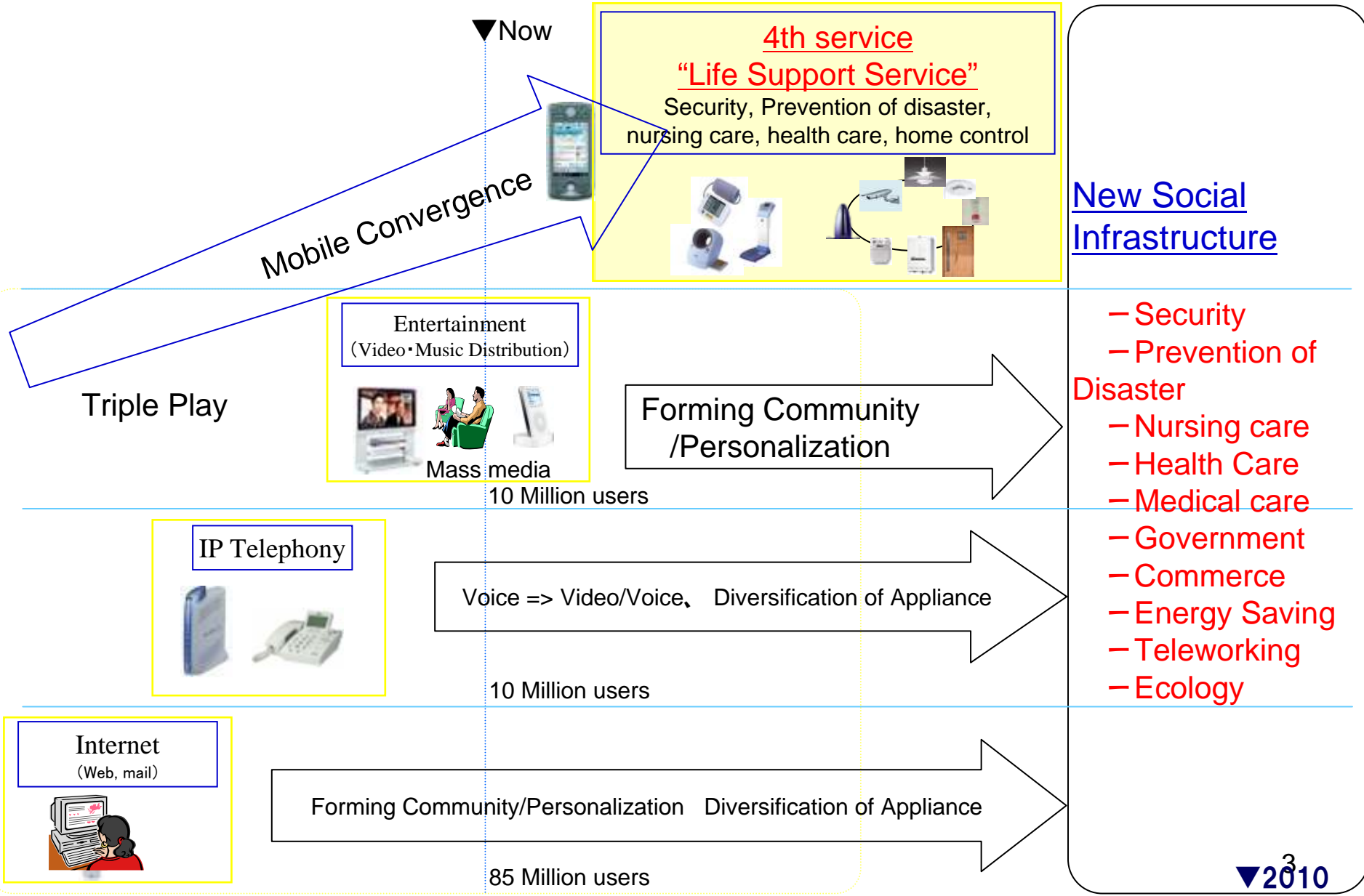
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# Generation Change from DSL to Optical in Japan (NTT)



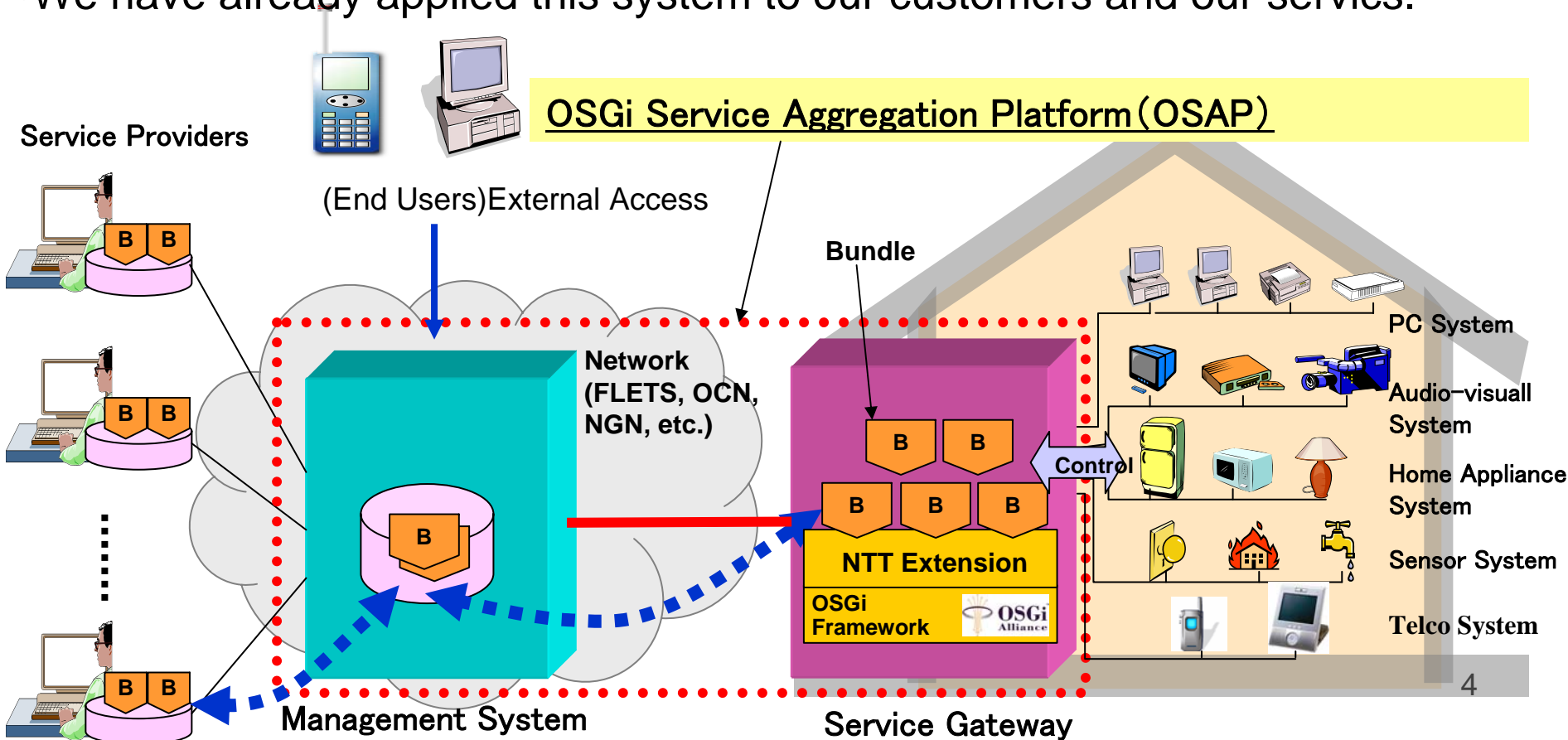
#FTTH > #ADSL

# NTT's Network Service Strategies

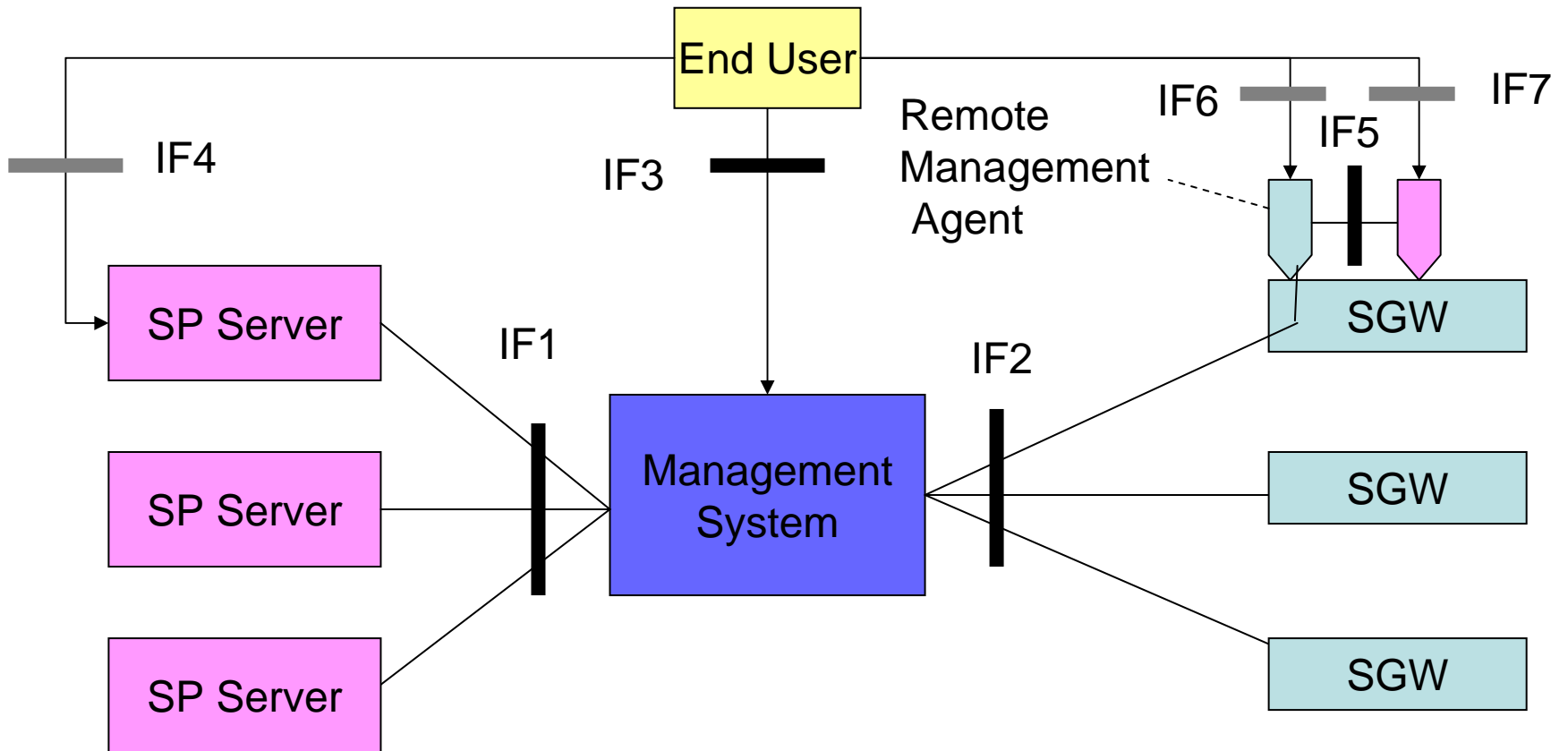


# Next Generation "ICT Home" based on OSGi Standard

- Service Providers aggregation by OSAP.
- Multiple Service Providers (SPs) provide their services with sharing clients service gateway and Management System.
- Customers can subscribe Applications from multiple SPs.
- We have already applied this system to our customers and our services.



# Interface Model



SP: Service Provider

# Roles

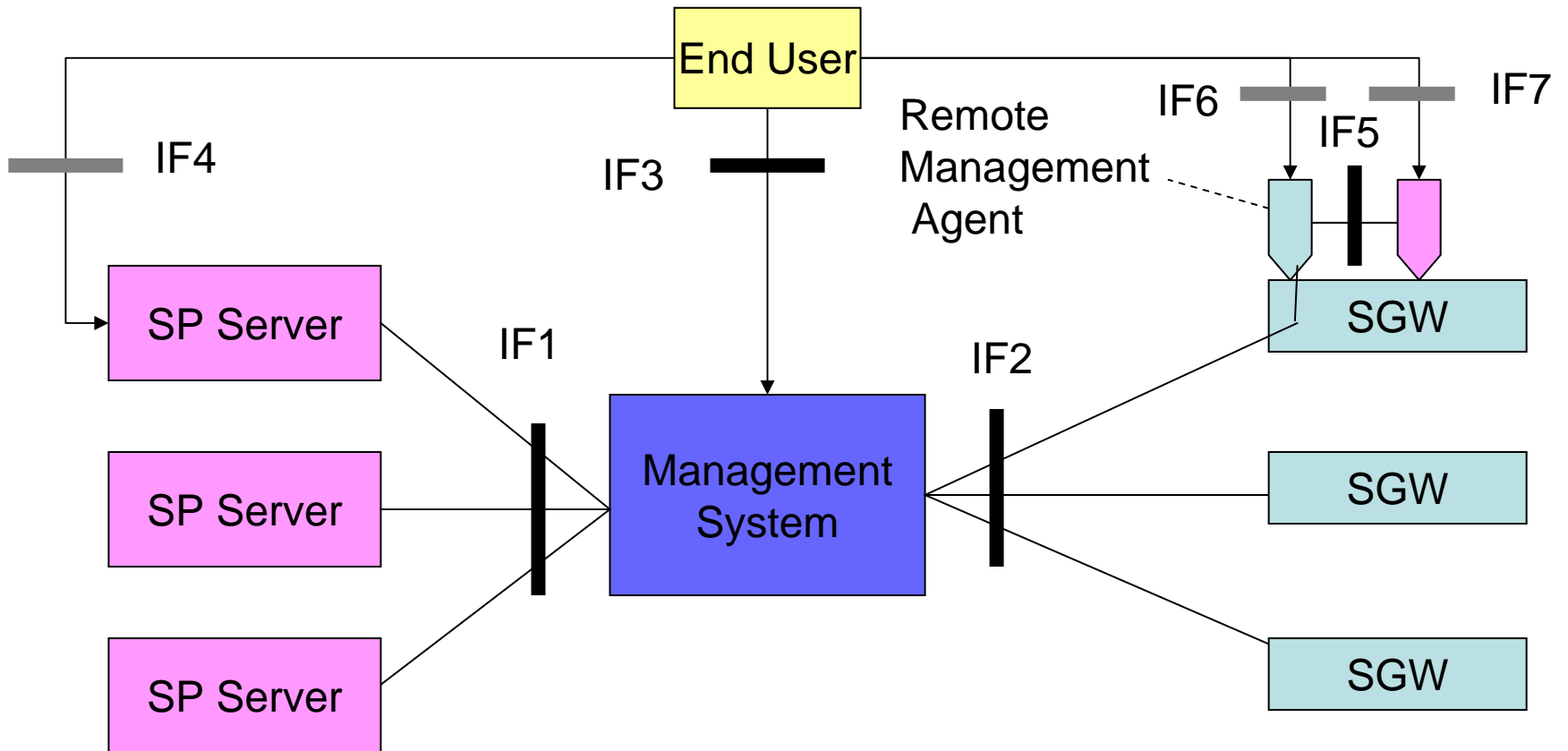
## System

- **SP Server**
  - Server system provided by Service Provider.
  - Execute server side functions for typical “server-client” style applications.
- **Management System**
  - Deliver Applications (bundles) to End User.
  - Remote management of SGWs and delivered bundles.
- **SGW**
  - Service Gateway consist of HW, OS, OSGi FW and Remote Management Agent.
  - Execute applications (bundles)

## Company/Human

- **End User**
  - User of Home Service.
- Service Provider (SP)
  - Provides Applications ( realized as bundles ) to End User via Management System.
  - Provides bundles and Server for enabling Applications.
- Management Operator
  - Operates Management System
- SGW Supplier (Management Operator may act this role too. )

# Interface Model



SP: Service Provider

# IF1 (Service Provider - Mgt. System )

- Service Provider -> Mgt. System
  - Register Bundles onto Management System.
  - Update/ Delete Bundles on Management System.
  - Associate end user with an Application.
  - Monitoring SGW (health check)
  - Get Statistics of SGW
- Service Provider <-> Mgt. System
  - Mutual Authentication
  - Message/Event Delivery

# IF2 (Mgt. System – SGW)

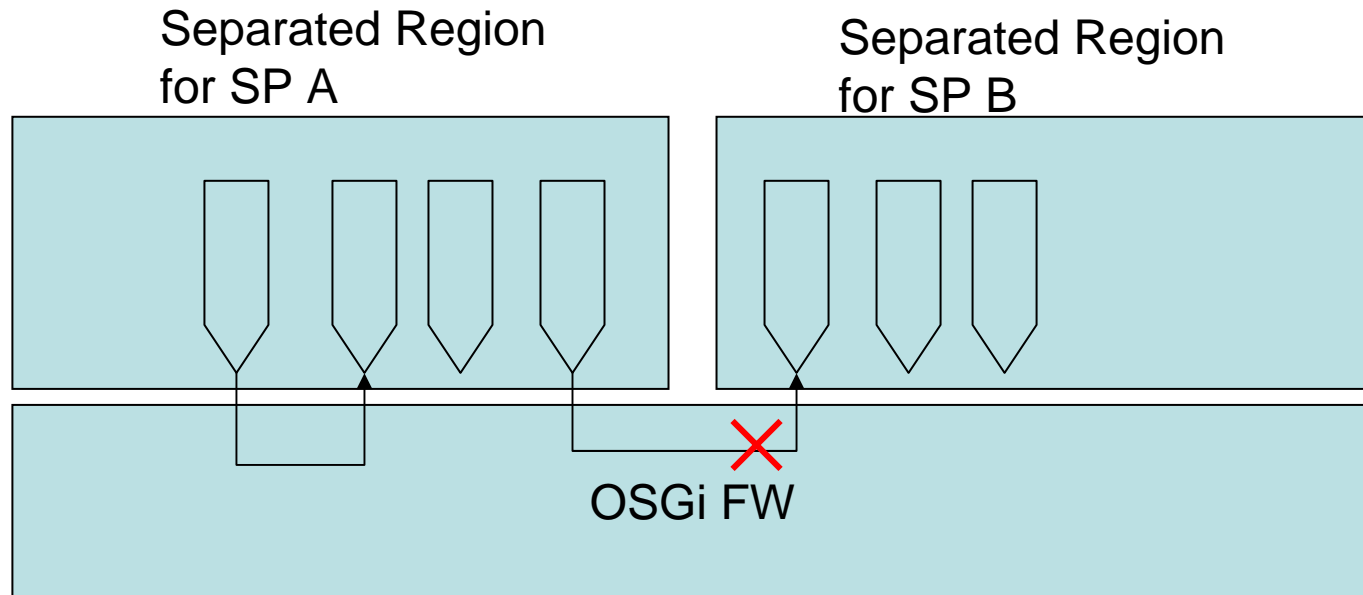
- **Bundle Level Functions**
  - Message/Event delivery
  - Bundle Download
  - Bundle life cycle control
  - Bundle Configuration
    - Configuration Admin
    - Permission Admin
- **SGW Level Functions**
  - SGW Authentication
  - Log gathering
  - Monitoring SGWs (Health Check)

IF3 (End User – Mgt.system)

IF4 (End User – SP Server)

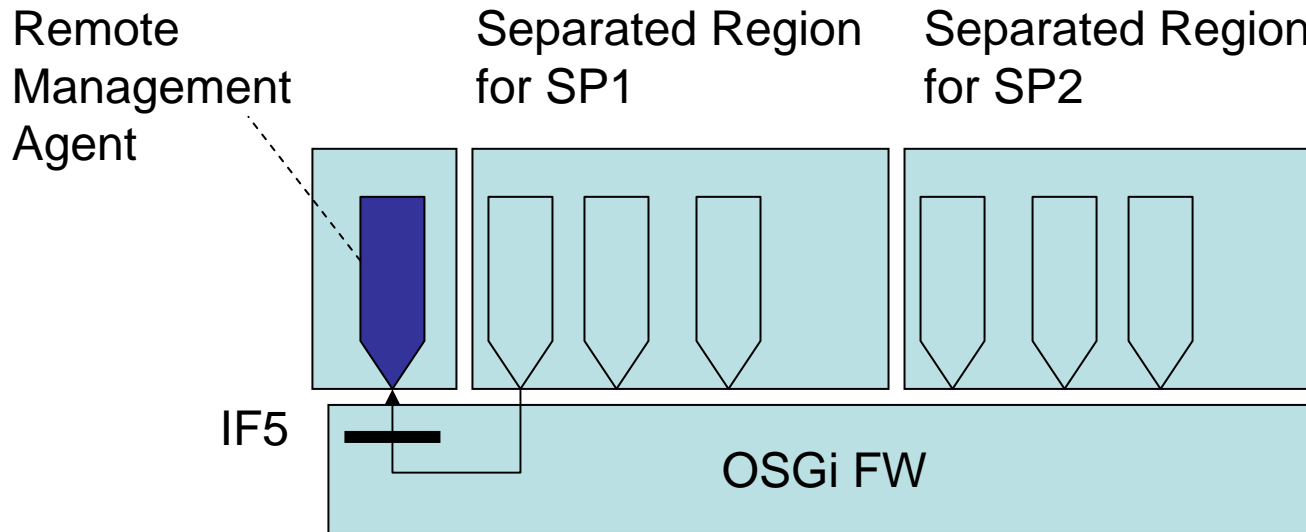
- Both IF3/ IF4
  - Subscribe/unsubscribe Applications
  - Browse list of Applications
  - Confirm update of Applications
    - Update requires Application halt.
- IF4
  - Application Specific Interface
  - We have developed this IF by each customers requirements.

# Basic Concept of SP Separation



- With “Separation”, a bundle can not access other SP’s resource (bundles, devices, and server).
- Security issue for “separation” should be considered on Management System, and some Interfaces (IF1, IF2, IF5) .

# IF5 (Remote Mgt. Agent – SP Bundles)



- Remote Management Agent (RMA) is a privileged bundle, which implements IF2 and IF5
- RMA allows SP bundles to execute privileged operations through IF5.
- i.e. Bundles in Separated Region is running with limited permissions to keep “separation”.
- Example functions on IF5
  - A SP bundle can control bundles provided by the same SP.
  - A SP bundle sends message/ events to the SP server.

# IF6/ IF7

- IF6 (End User - Remote Managed Agent)
  - We haven't use this IF for security reasons.
- IF7 (End User – Application Bundle)
  - Application Specific
  - .

# Our requirements to the e2e specifications

- Adaptability to non-DSL devices.
- Sharing Model of Management system and service gateway.
- Security consideration for “Separation” is required.