

# **Broadband IPv6 Solutions from Hitachi**

**Uri Rahamim**

**VP Worldwide Sales & Marketing**

**Hitachi Internetworking**

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**Global IPv6 Summit**

**Madrid, May 2003**

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# Full Array of Broadband IPv6 Products

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## ▶ Broadband Routers

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- ▶ **Broadband Access Servers**

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  - ▶ **Broadband Network Management**
-

# Hitachi Broadband Routers

**GR2000**

# Hitachi Broadband Routers

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# Comprehensive Product Family

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## ▶ 8 \* Platforms

- ❑ 1 \* Common Architecture, 1 \* Operating System

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- ❑ High reliability components, Resilience, Redundancy.

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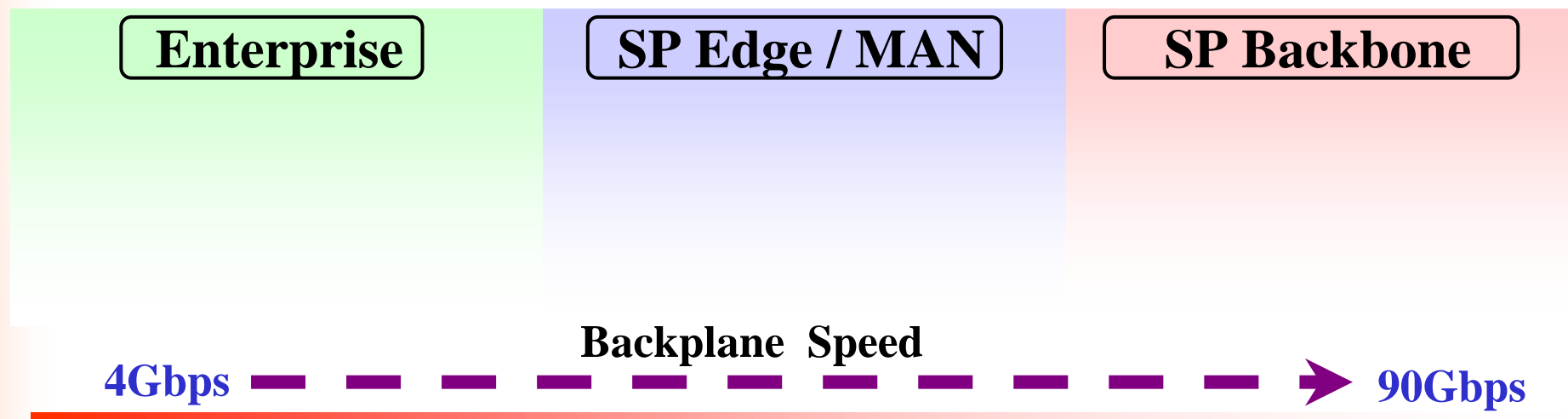
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# Starting a Commercial IPv6 Service



I need IPv6 in order to start commercial P to P services.

Is there a router compatible with my business services plan?

**IPv6 hardware routing**

**IPv6 protocol support; RIPng, BGP4+, OSPF, etc.**

**H/w enabled service functions, ex. QoS**

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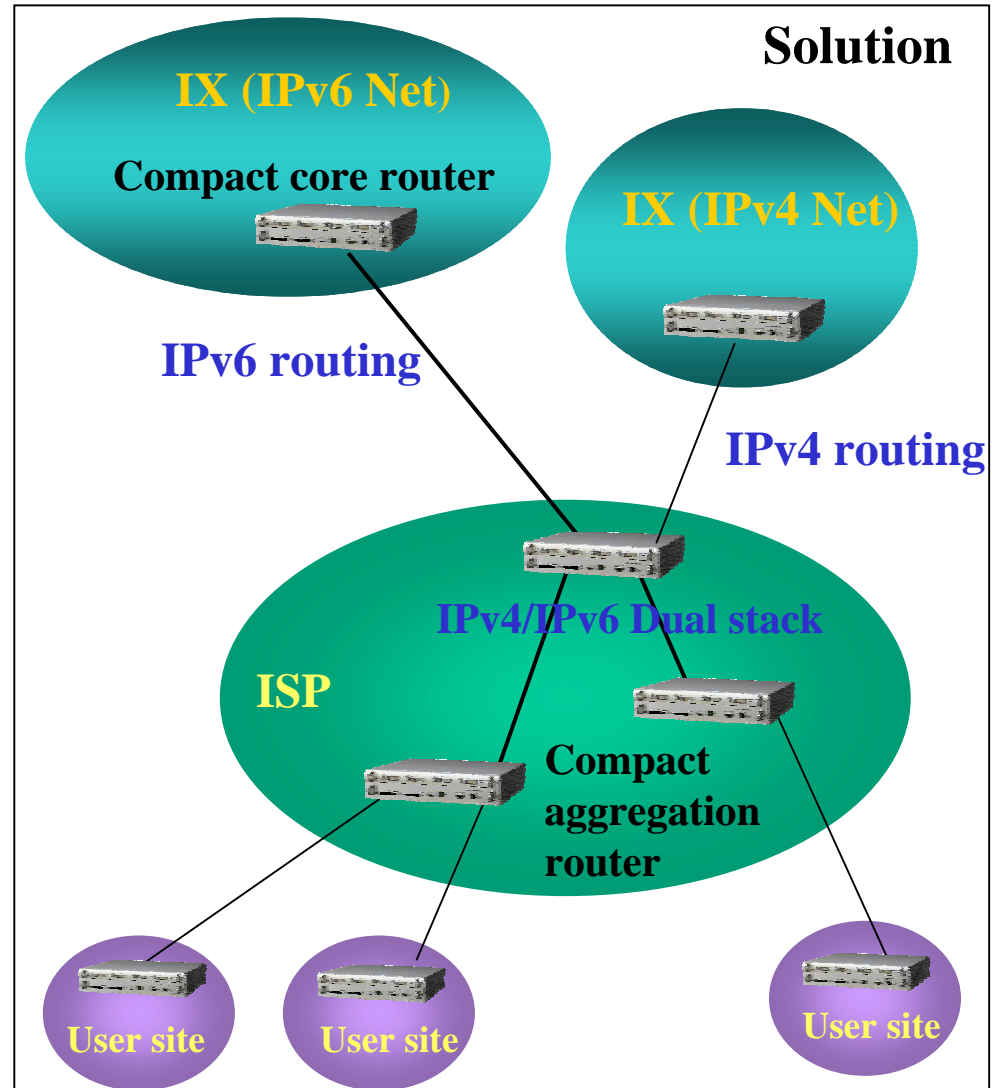
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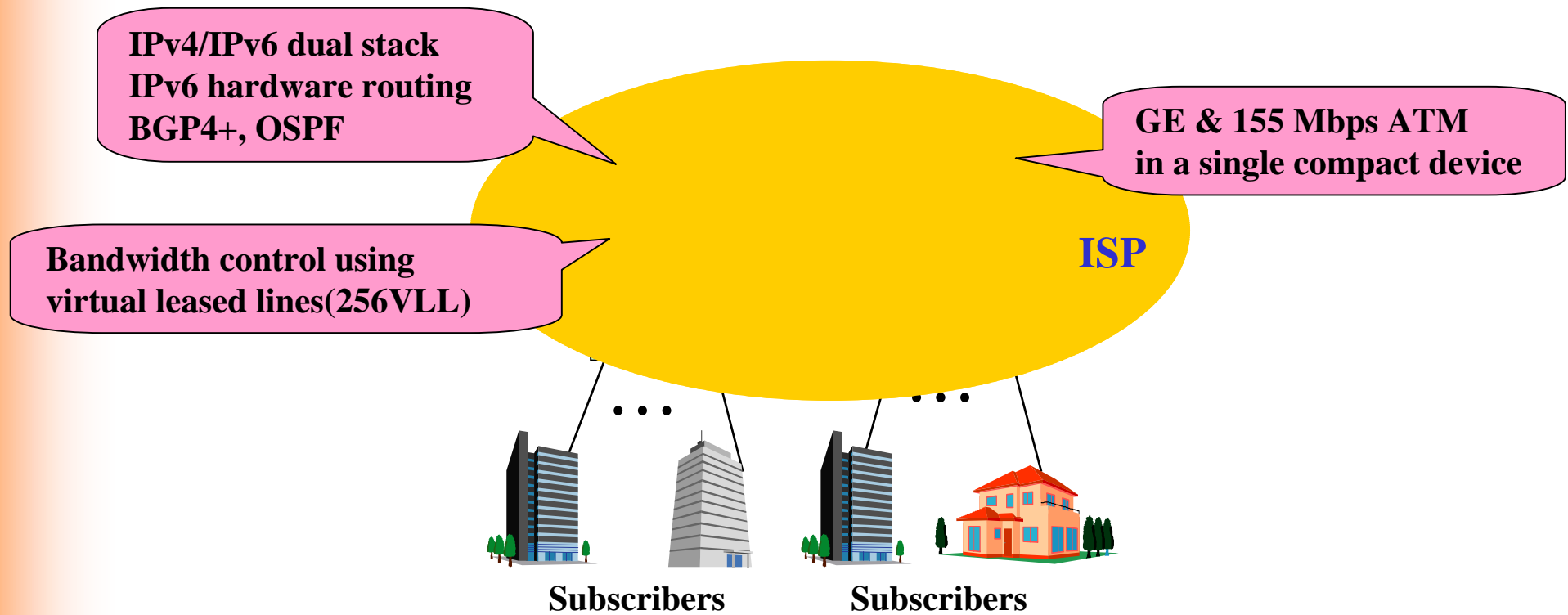
# Details of the Network Configuration

**IPv4/IPv6 dual stack  
IPv6 hardware routing  
BGP4+, OSPF**

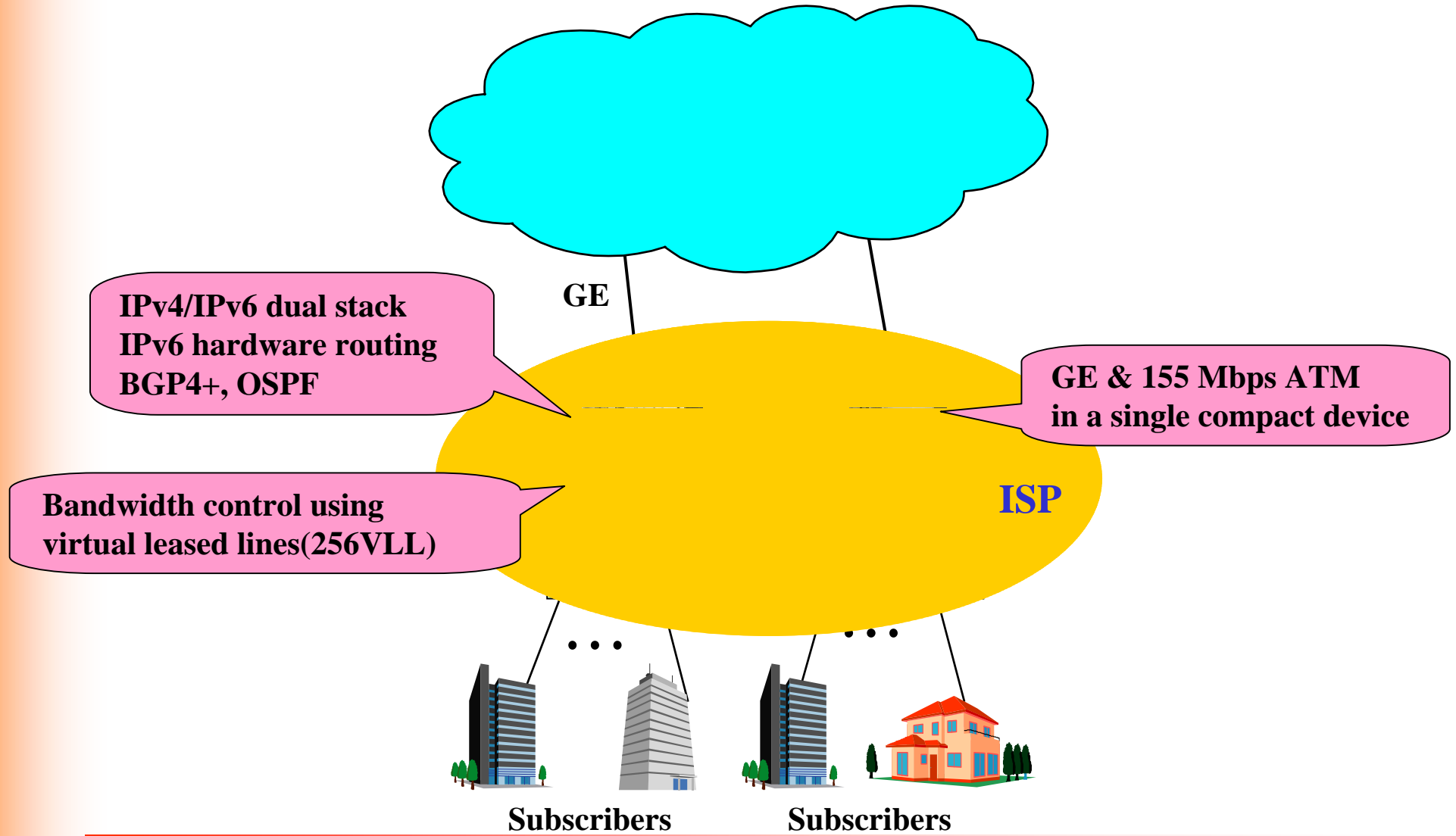
**Bandwidth control using  
virtual leased lines(256VLL)**

**GE & 155 Mbps ATM  
in a single compact device**

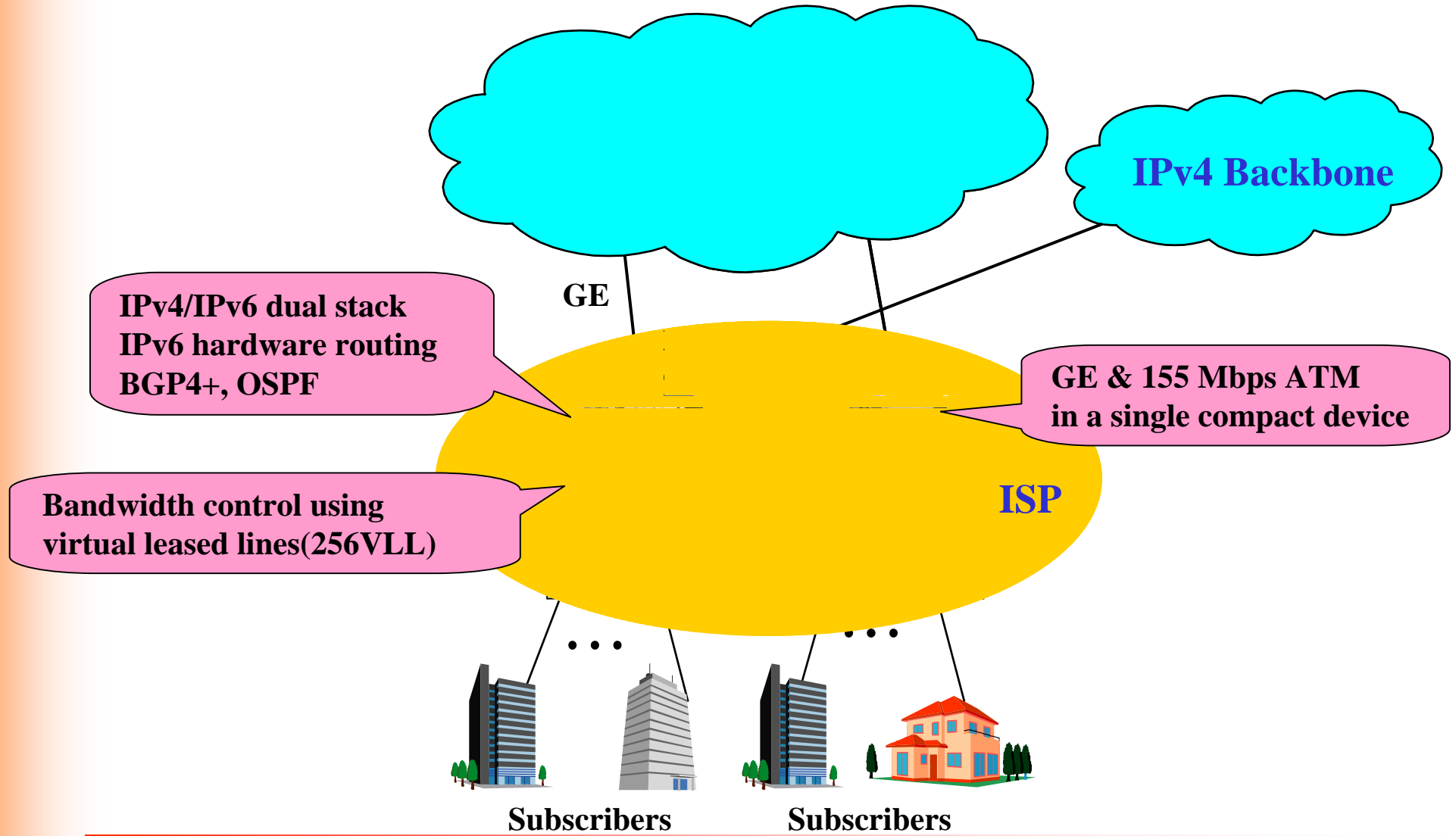
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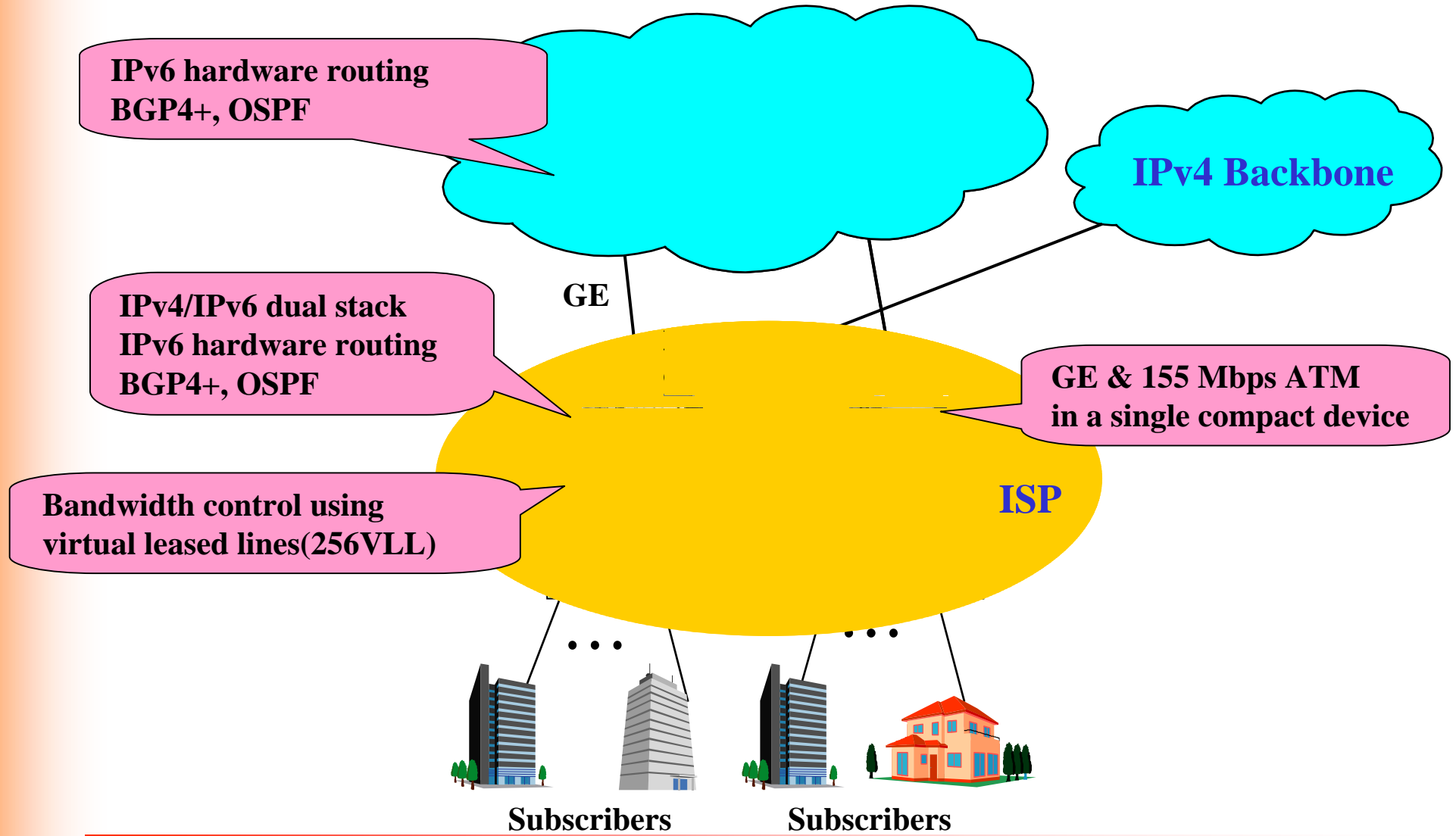
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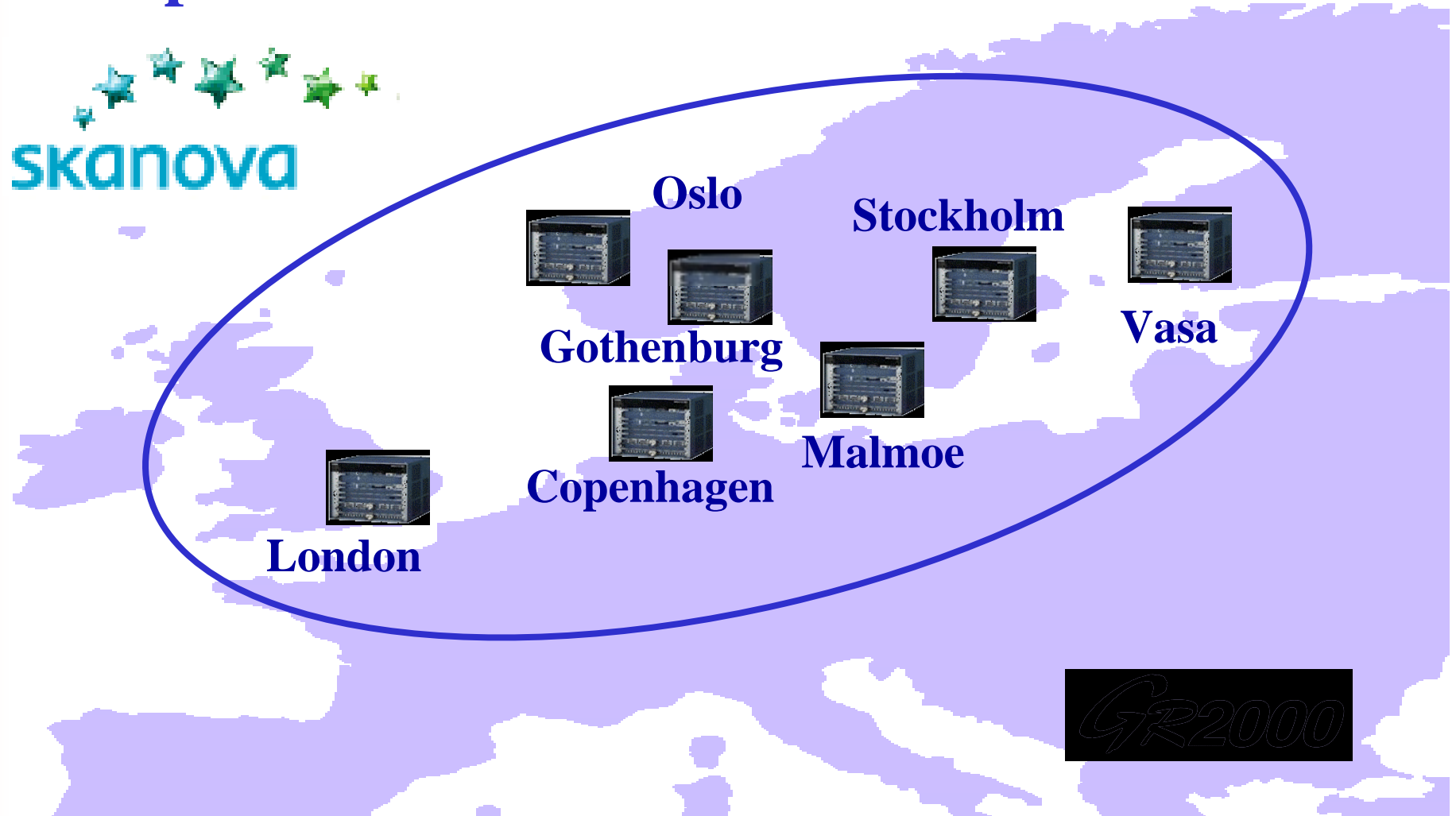


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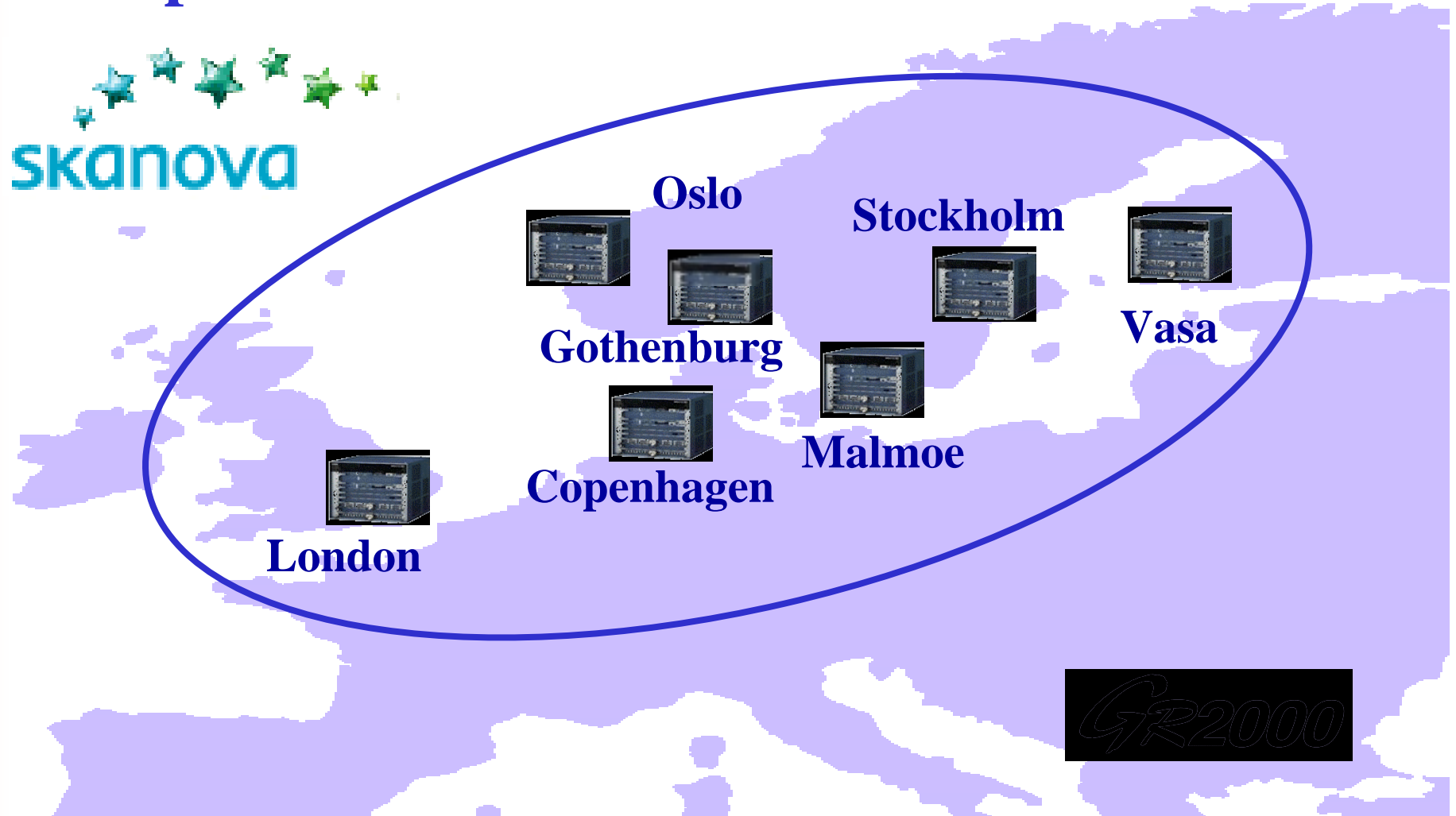
# Commercial Deployment (Europe)

## ► 1<sup>st</sup> Operational Euro IPv6 Network Nov. 2001



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# Hitachi Broadband Access Servers

***AG8100-B***

# Hitachi Broadband Access Servers

*AG8100-B*



# AG8100 BRAS Functional Overview

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# AG8100 BRAS Functional Overview

## ▶ Connect to Physical Layer Termination Devices

- ❑ DSLAM (ADSL), CMTS (CATV), etc.

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- ❑ Access request reception, Authentication, IP address assignment, Connection to ISP

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## ▶ Traffic Management

- ❑ Aggregation, Routing, Tunneling, and Quality Control
- ❑ PPP Sessions = 16,384
- ❑ L2TP Tunnels = 1,024
- ❑ 802.1Q VLANs = 4,096 / Port
- ❑ VP / VC = 126 / 4094 per System

# AG8100 BAS Features Overview

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## ▶ High Performance

- ❑ 4Gbps (L2TP=2Gbps) - optimises bandwidth utilisation
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## ▶ Speed & flexibility using Network Processors

- ❑ Two models,
  - Type 1: 16 \* FE (T/TX) + 6 \* GE (SX/LX)
  - Type 2: 16 \* FE (T/TX) + 4 \* GE (SX/LX) + 2 \* ATM (OC-3)
- ❑ Compact size (2U)
- ❑ Industry standard CLI (Command Line Interface)

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## ▶ Adv. capabilities for Content Delivery and VoIP

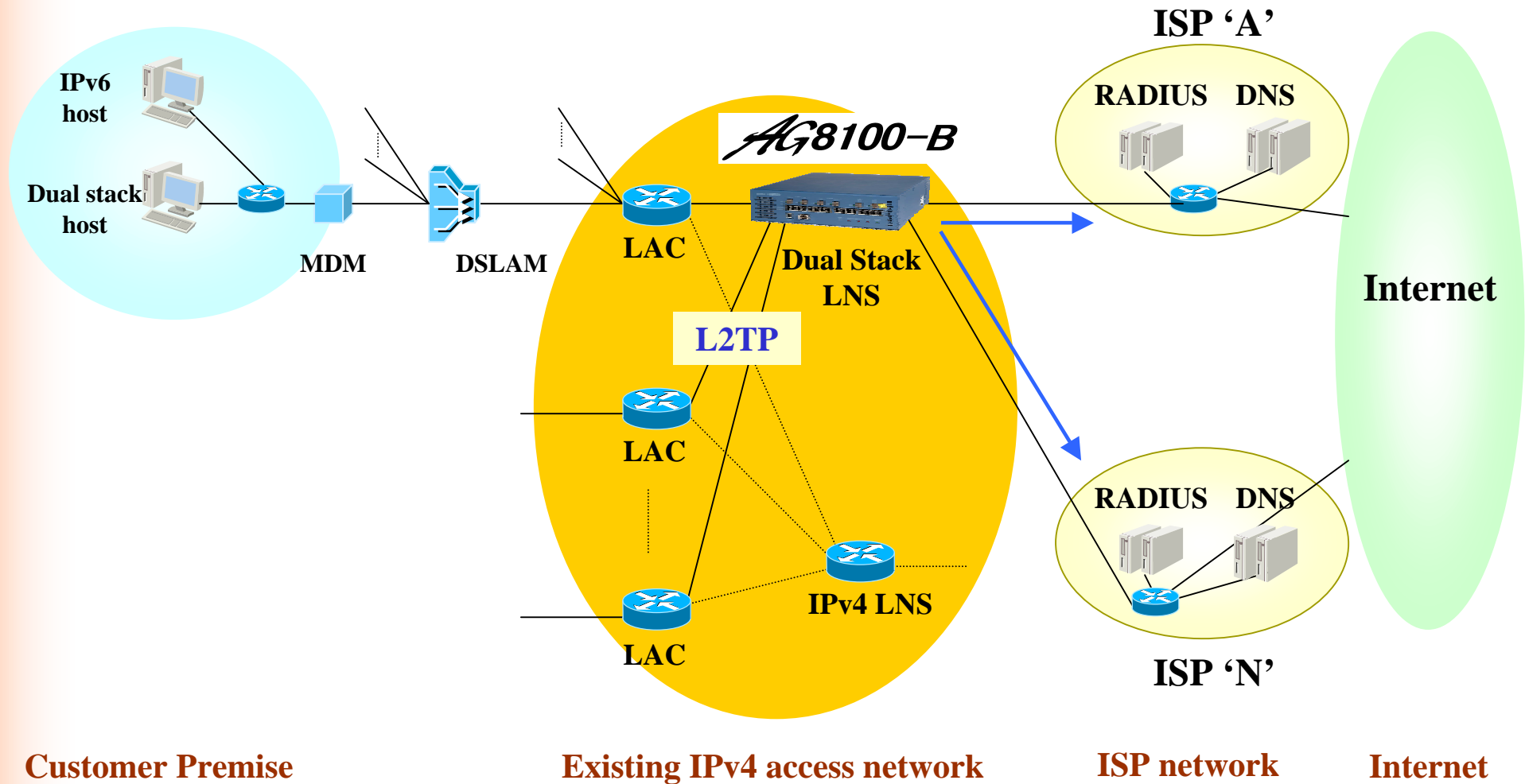
- ❑ IPv6 PPP for IPv6, DHCPv6 PD

- ❑ L2TP server redirect function for content delivery services

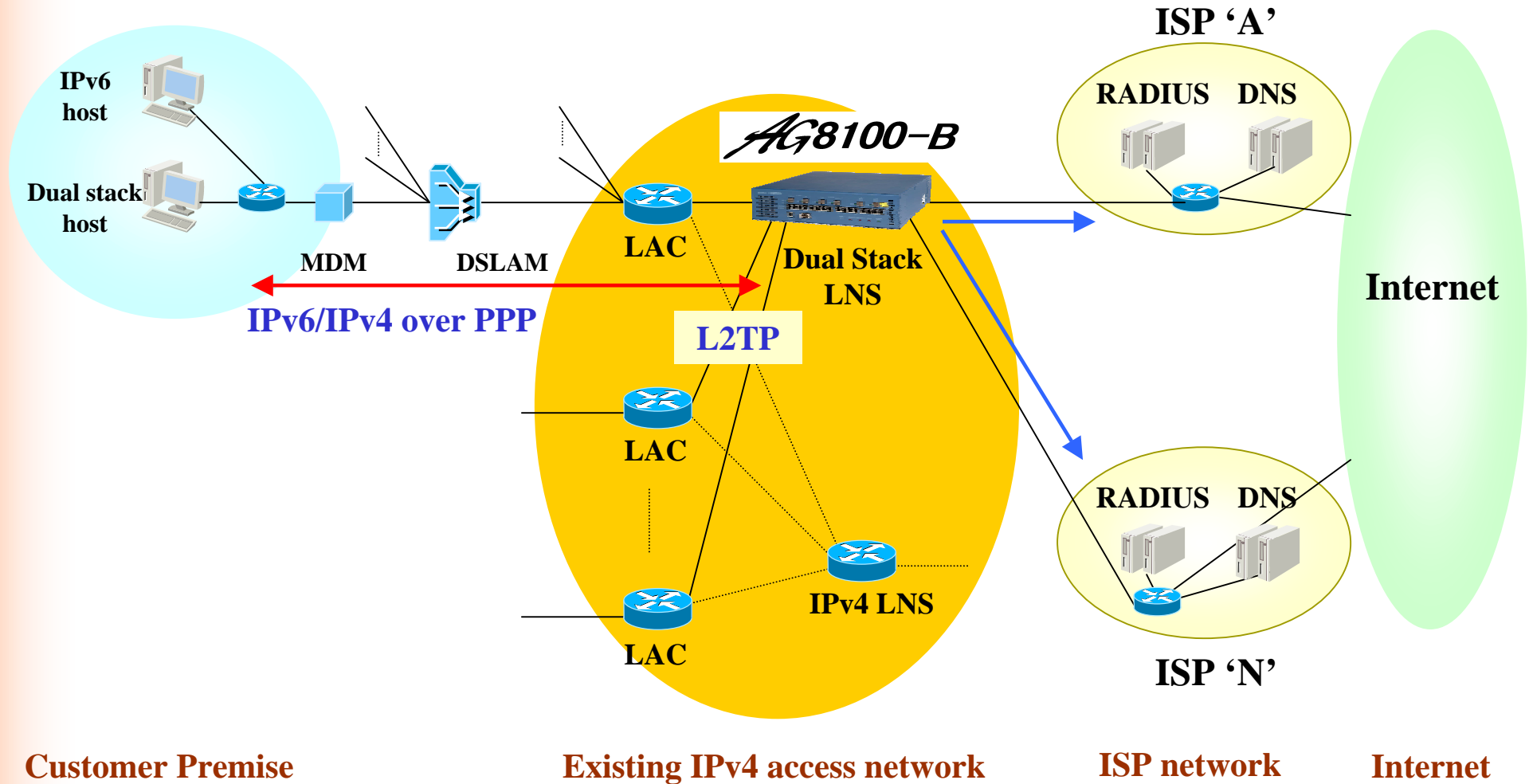
# Commercial Deployment (Major Japanese Broadband Service Provider)

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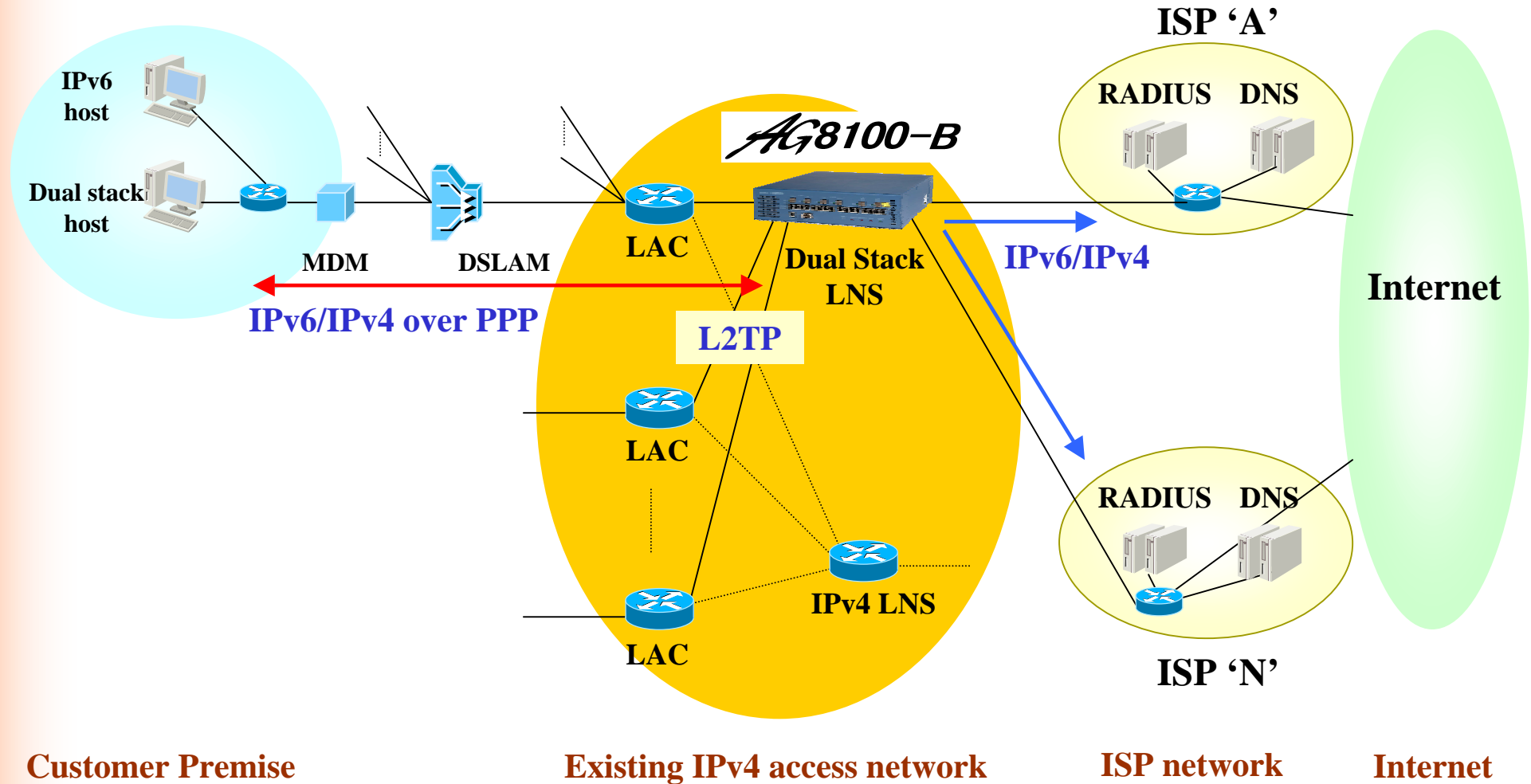
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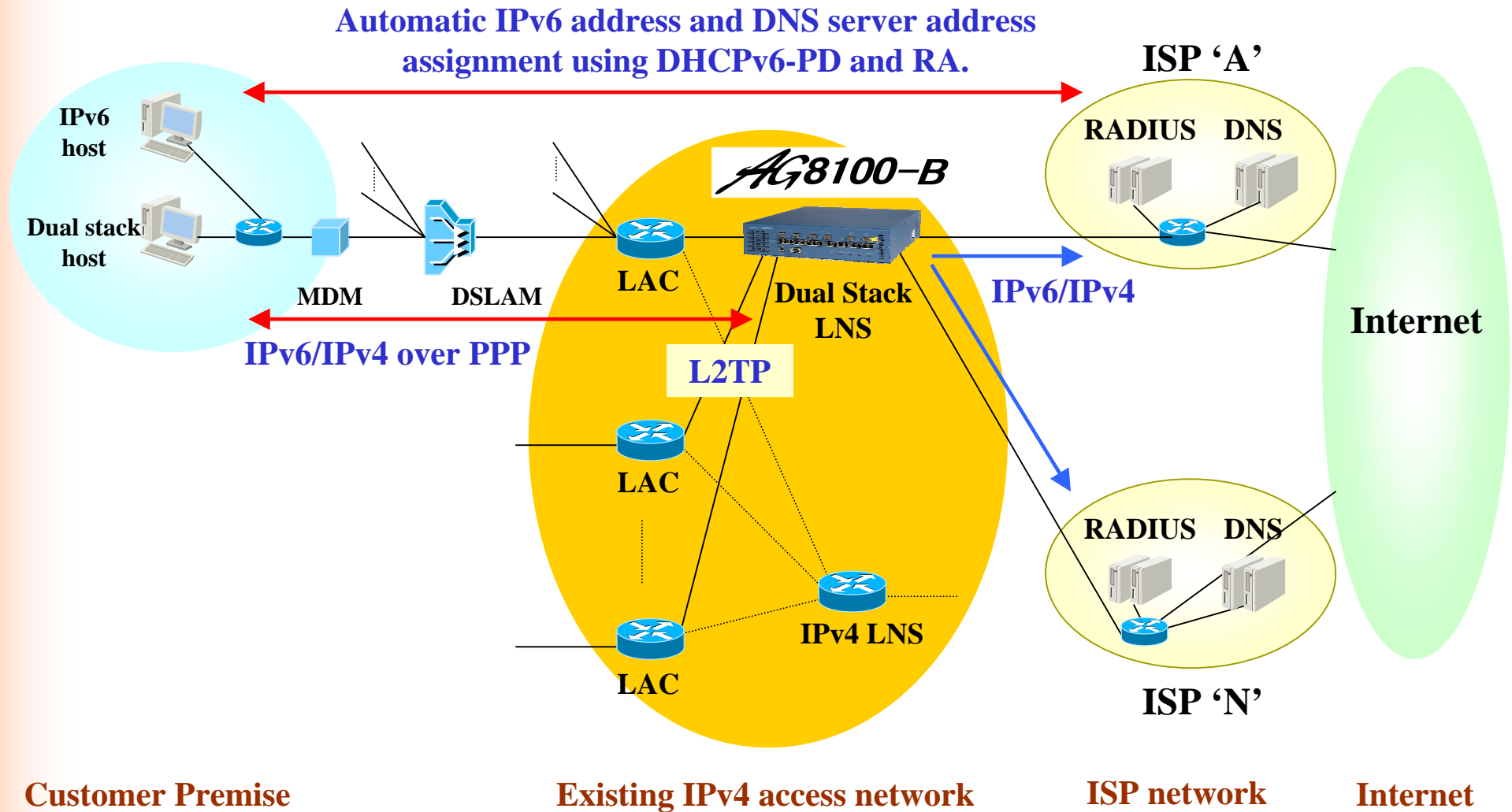
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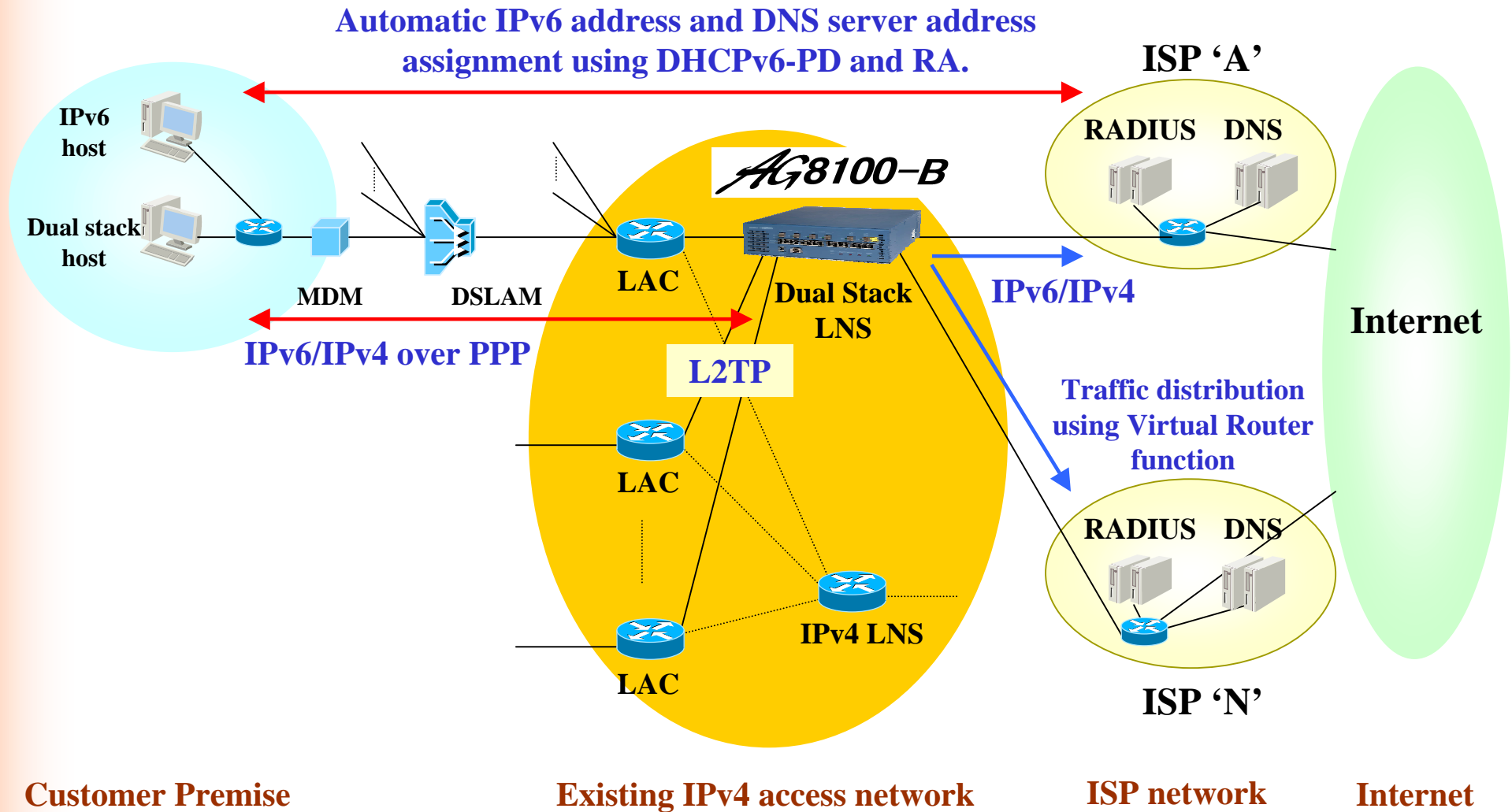
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# Hitachi Broadband Address Translator

*AG8100-T*

# Hitachi Broadband Address Translator

*AG8100-T*



# Address Translator Features

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## ▶ IPv4/v6 bi-directional Address Translation

# Address Translator Features

- ▶ **IPv4/v6 bi-directional Address Translation**
- ▶ **Address Translation for IPv4 Private Nets**

# Address Translator Features

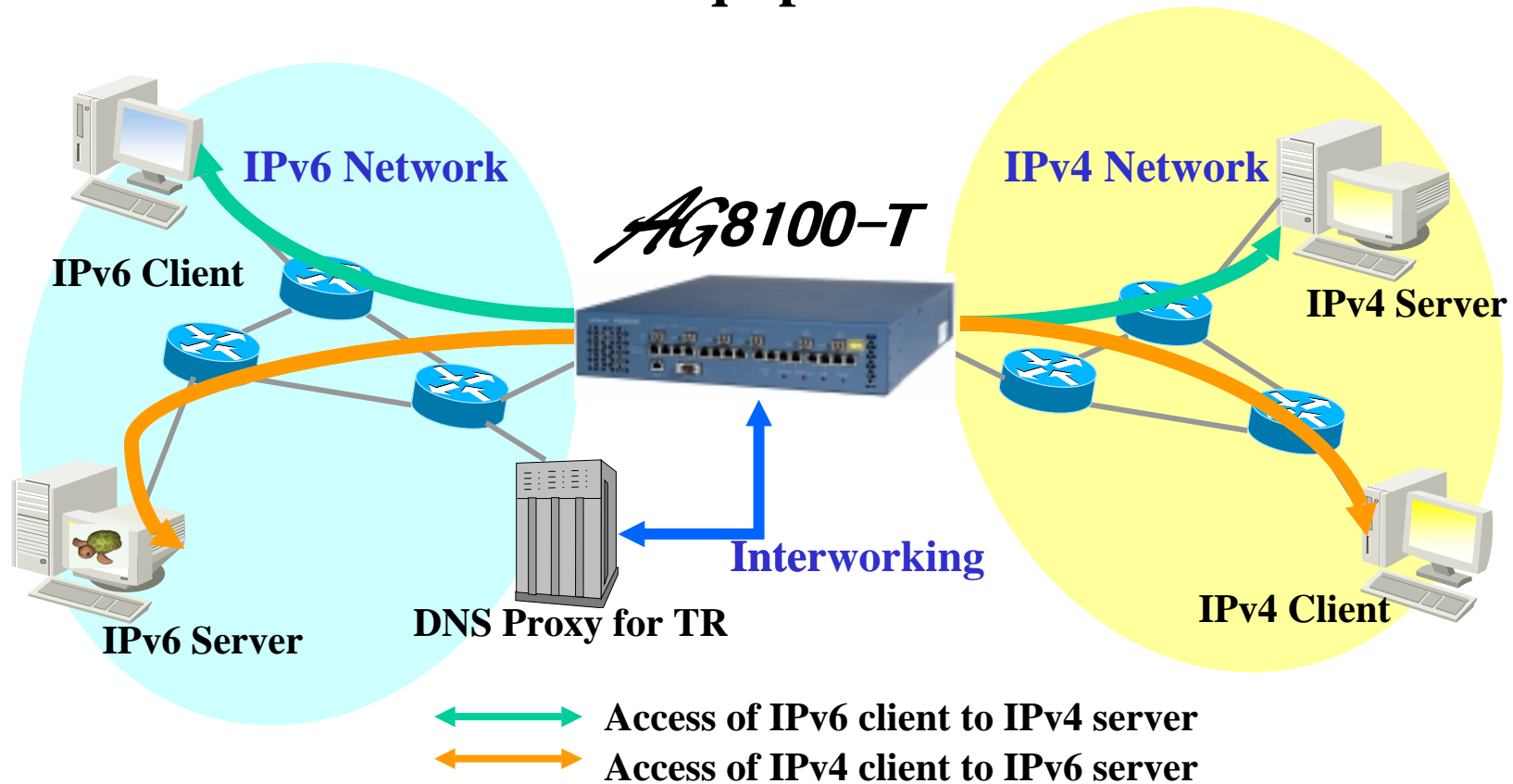
- ▶ **IPv4/v6 bi-directional Address Translation**
- ▶ **Address Translation for IPv4 Private Nets**
- ▶ **Address Resolution & Load Balancing via DNS**
  - ❑ Relaying of DNS query from v4 side to v6 side (& vice versa).
  - ❑ Auto generation of address translation entries
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- ▶ **High speed Performance**
  - ❑ Based on Network Processor Architecture
  - ❑ 2Gb/s throughput
  - ❑ 16,384 Address translation entries
  - ❑ < 128 VPNs (Virtual Translators)

# Deployment Scenario #1

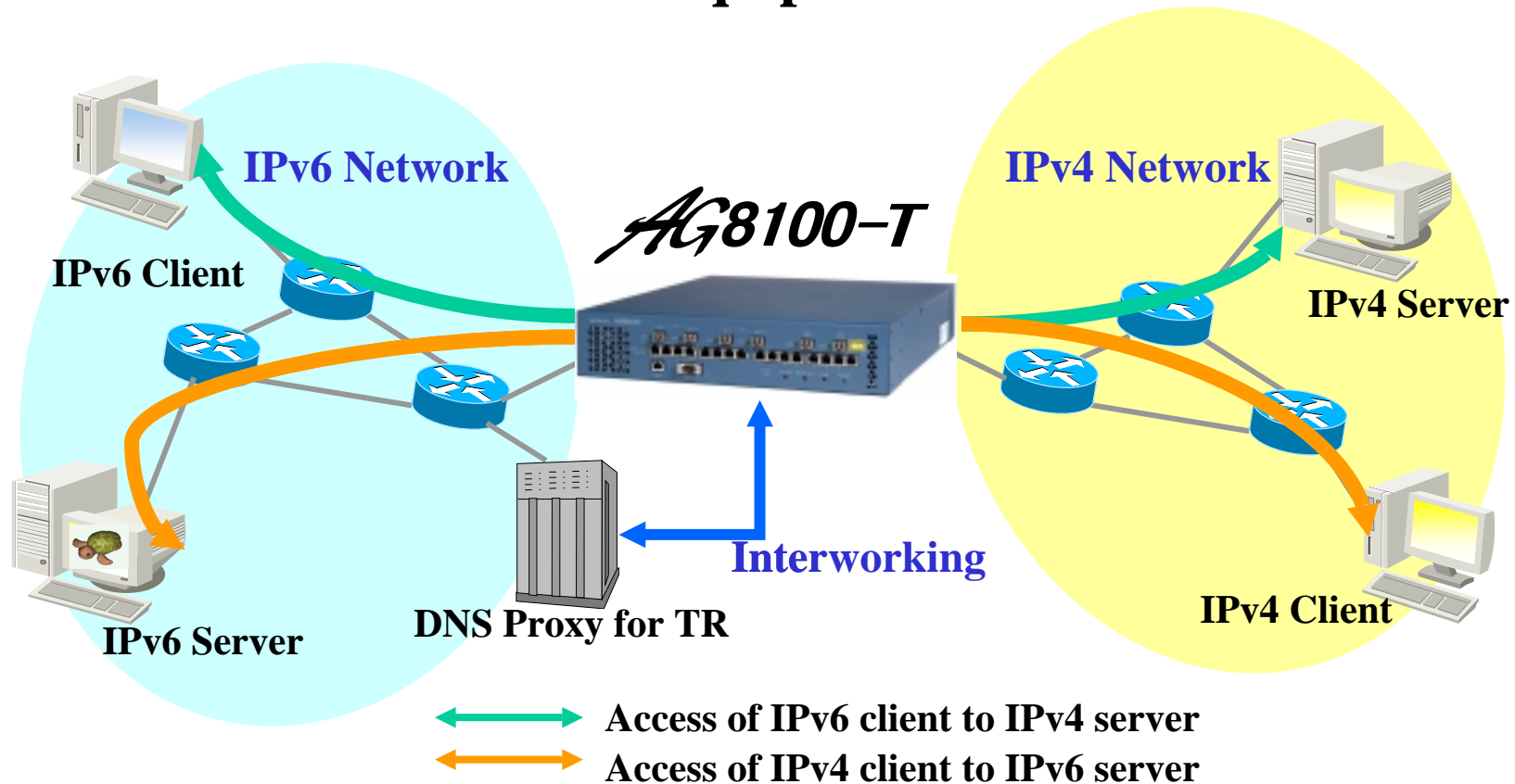
- Maintain access to IPv4 equipment from IPv6 network



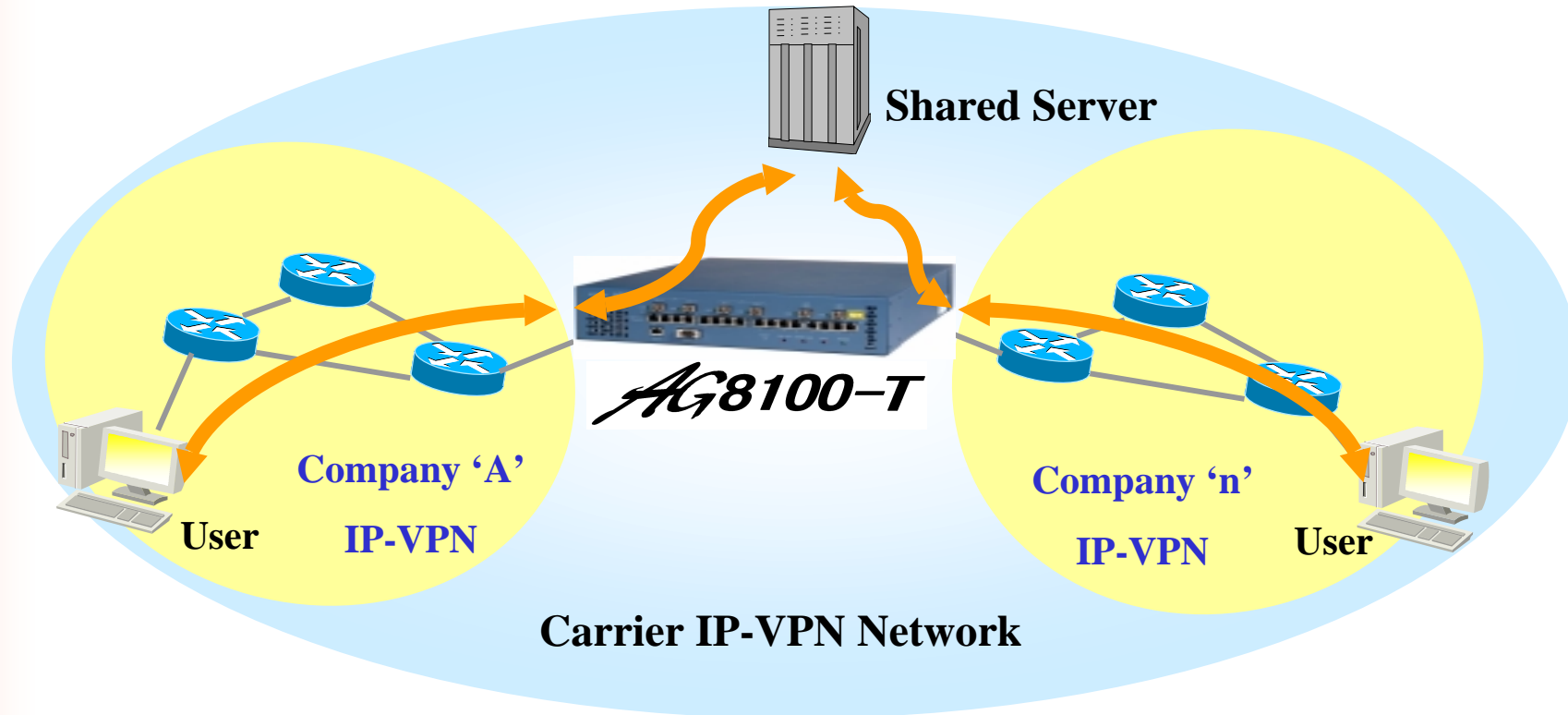
# Deployment Scenario #1

## ► Connect existing IPv4 devices to IPv6 network

- ❑ Enable smooth migration to IPv6 environment
- ❑ Maintain access to IPv4 equipment from IPv6 network

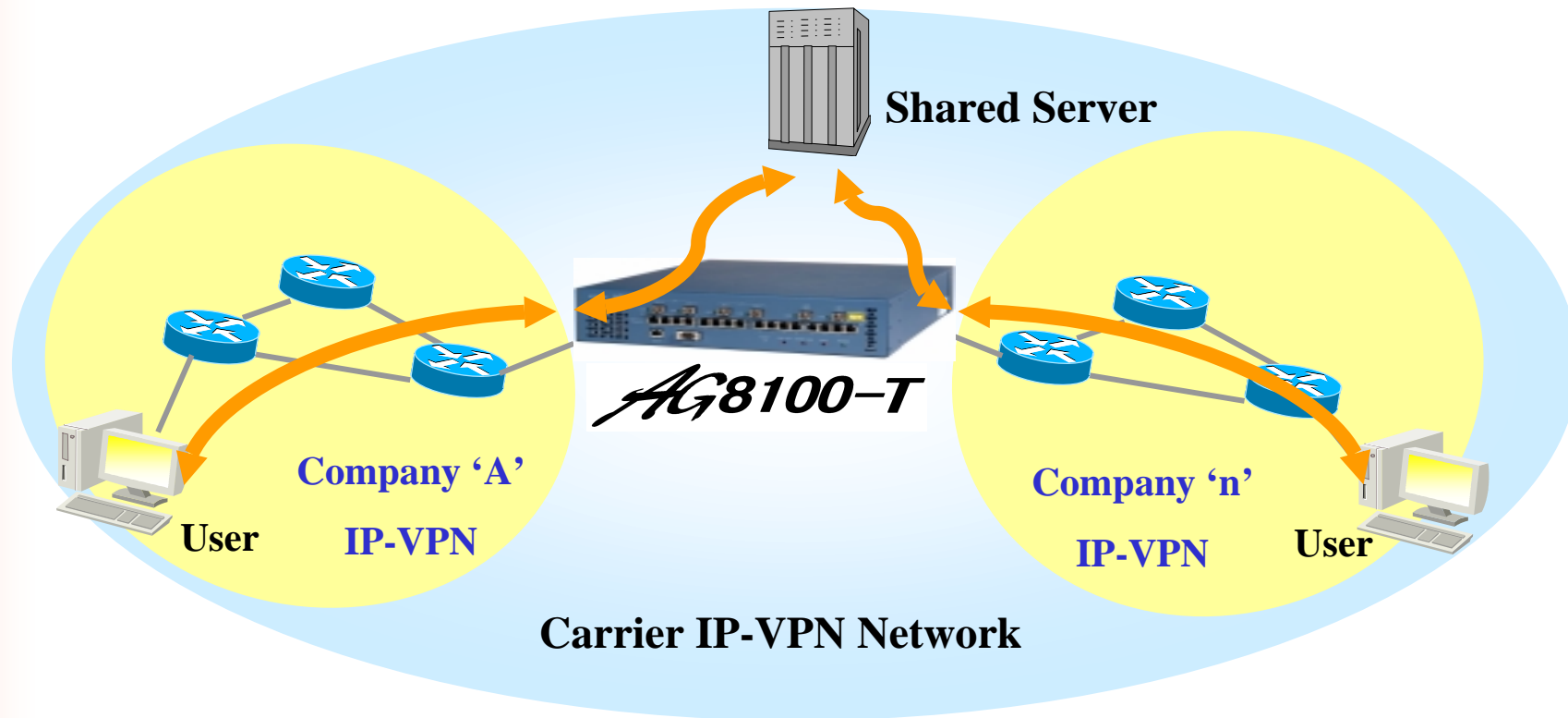


# Deployment Scenario #2



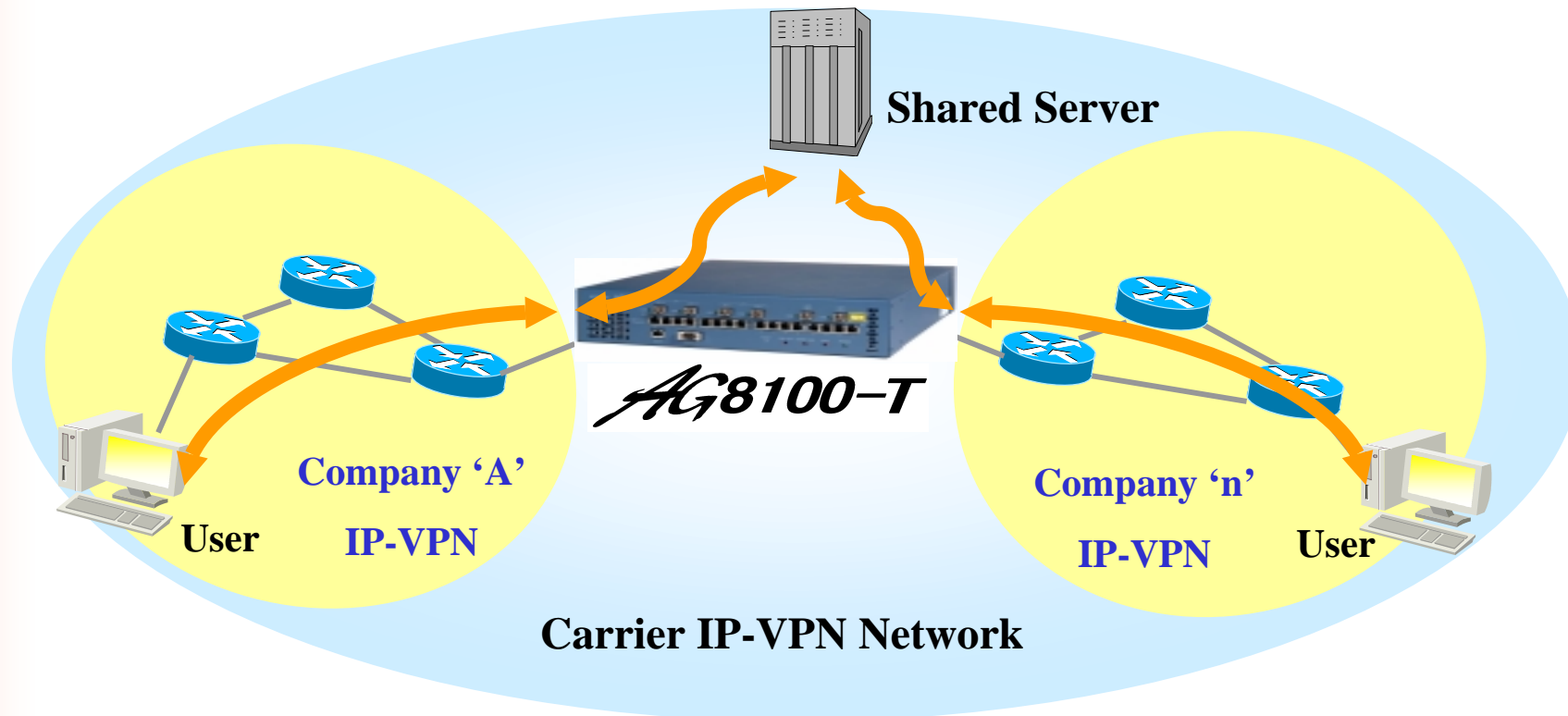
# Deployment Scenario #2

## ► Address Translation between multiple IP-VPNs



# Deployment Scenario #2

- ▶ **Address Translation between multiple IP-VPNs**
- ▶ **Access shared resources from multiple IP-VPNs**



# Hitachi Broadband Network Management

JP1  
VERSION 6i

# Hitachi Broadband Network Management



JP1  
VERSION 6i

# Infrastructure Management

Automatic discovery for Nodes and IP topology

Intuitive, multi-layered GUI

Node status;  
**Enabled(Green)**  
**Disabled(Red)**

IPv4 network view

ATM network view

IPv6 IP topology view

## ▶ Network device and network link management

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# Infrastructure Management

- ▶ Network device and network link management
- ▶ Consistent IP (v4 & v6) and ATM network mgmt

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Node status;  
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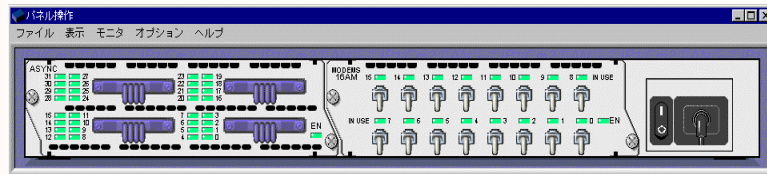
IPv4 network view

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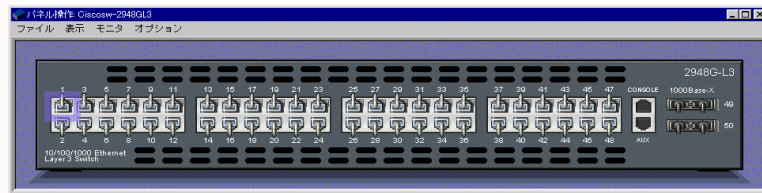
IPv6 IP topology view

# Element Management

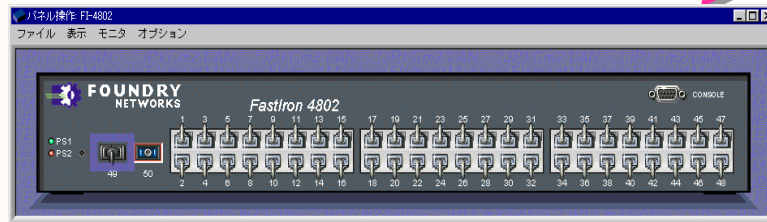
Cisco Routers



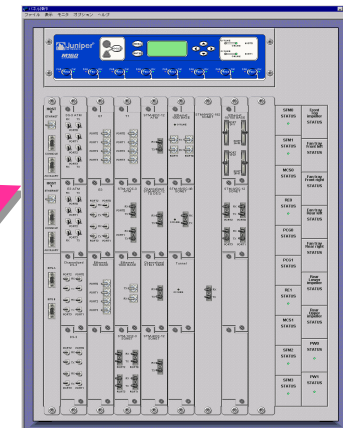
Cisco Switches



Foundry



Juniper



NetScreen

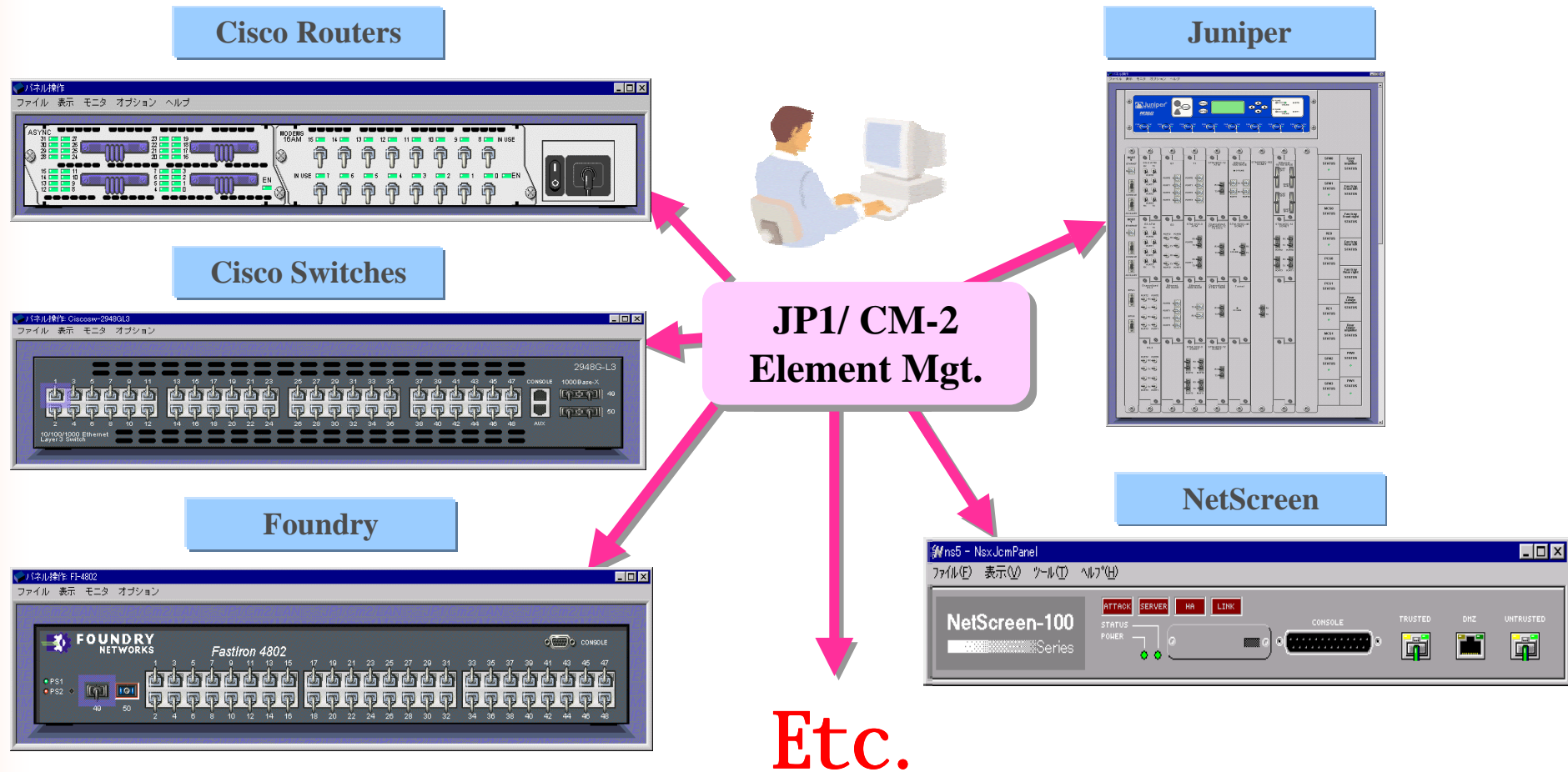


JP1/ CM-2  
Element Mgt.

Etc.

# Element Management

## ▶ Multi-vendor SNMP device mgmt. (IPv4 & IPv6)



# Policy Creation & Management

The screenshot displays a network management application with several windows open:

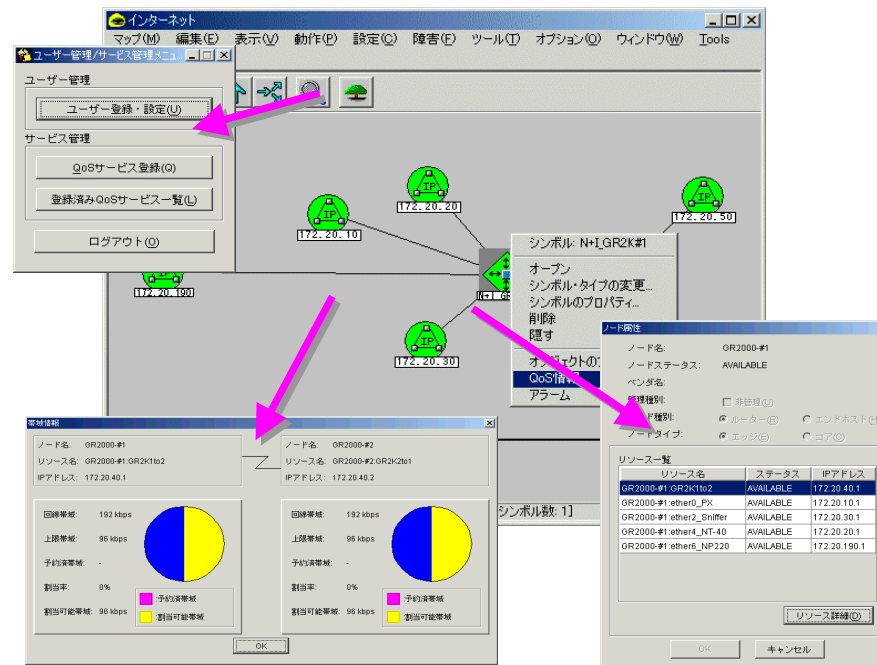
- インターネット (Internet):** The main window showing a network diagram with nodes labeled with IP addresses (172.20.10, 172.20.20, 172.20.30, 172.20.190, 172.20.40). A context menu is open over a node, listing options: シンボル: N+I\_GR2K#1, オープン, シンボル・タイプの変更, シンボルのプロパティ, 削除, 関連, オブジェクトの, OoS指定, アラーム.
- 詳細情報 (Details):** A window showing configuration for two nodes:
  - ノード名: GR2000-#1, リソース名: GR2000-#1 GR2K11b2, IPアドレス: 172.20.40.1. It includes a traffic control diagram with a pie chart and labels for 回線帯域 (192 kbps), 上限帯域 (96 kbps), 予約帯域 (-), 割当率 (0%), and 割当可能帯域 (96 kbps).
  - ノード名: GR2000-#2, リソース名: GR2000-#2 GR2K2b1, IPアドレス: 172.20.40.2. It has identical configuration fields.
- ノード属性 (Node Properties):** A window for node GR2000-#1 with fields for ノード名, ノードステータス (AVAILABLE), ペンダ名, and フォードタイプ (with radio buttons for ルーター and エンドホスト).
- リソース一覧 (Resource List):** A table listing resources for node GR2000-#1:

リソース名	ステータス	IPアドレス
GR2000-#1 GR2K11b2	AVAILABLE	172.20.40.1
GR2000-#1 ether0_FX	AVAILABLE	172.20.10.1
GR2000-#1 ether2_Sniffer	AVAILABLE	172.20.30.1
GR2000-#1 ether1_NT-40	AVAILABLE	172.20.20.1
GR2000-#1 ether6_NP220	AVAILABLE	172.20.190.1

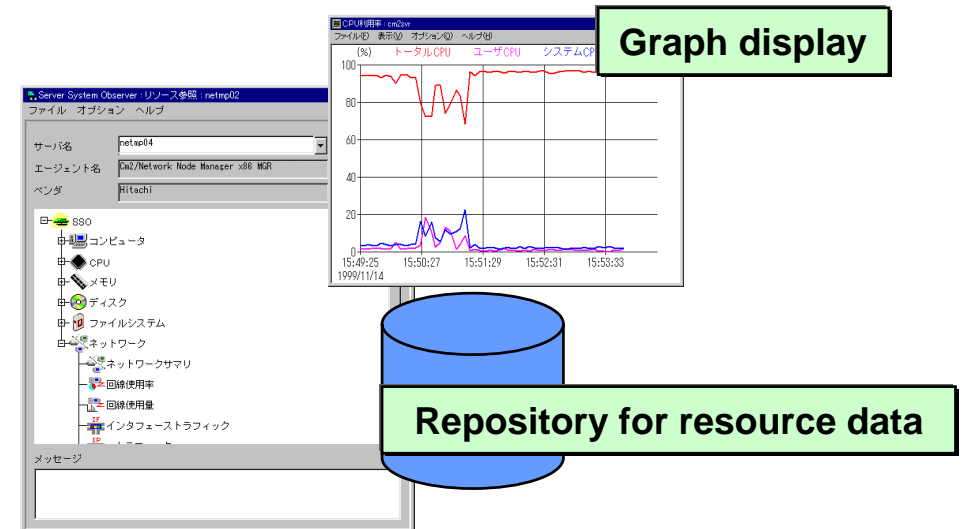
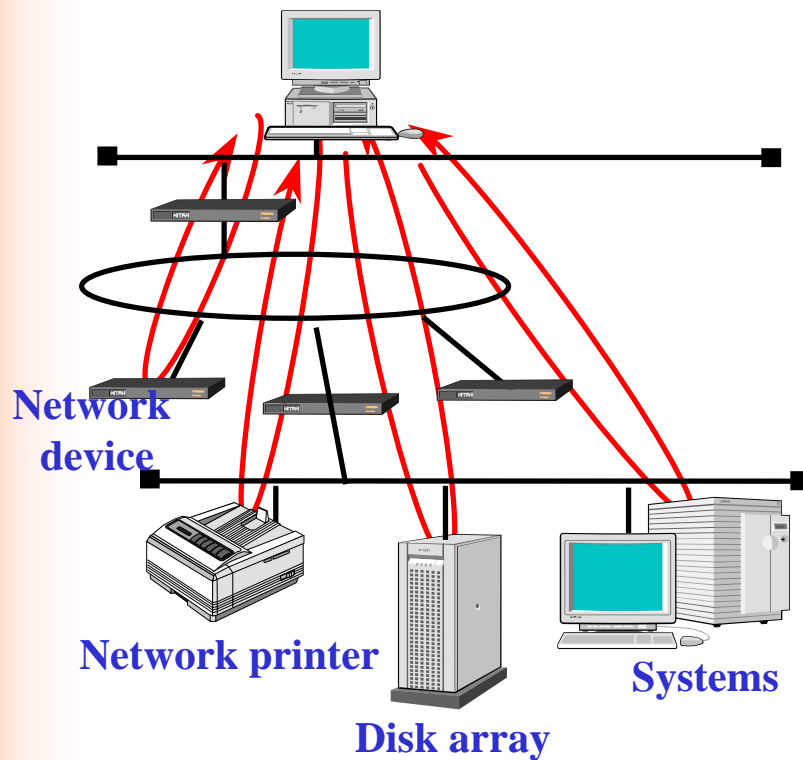
# Policy Creation & Management

## ▶ Transparent service policy deployment

- ❑ Point & Click policy creation / service deployment
- ❑ User / Application level policies defined via wizards
- ❑ Ex. Large scale network QoS via diffServe



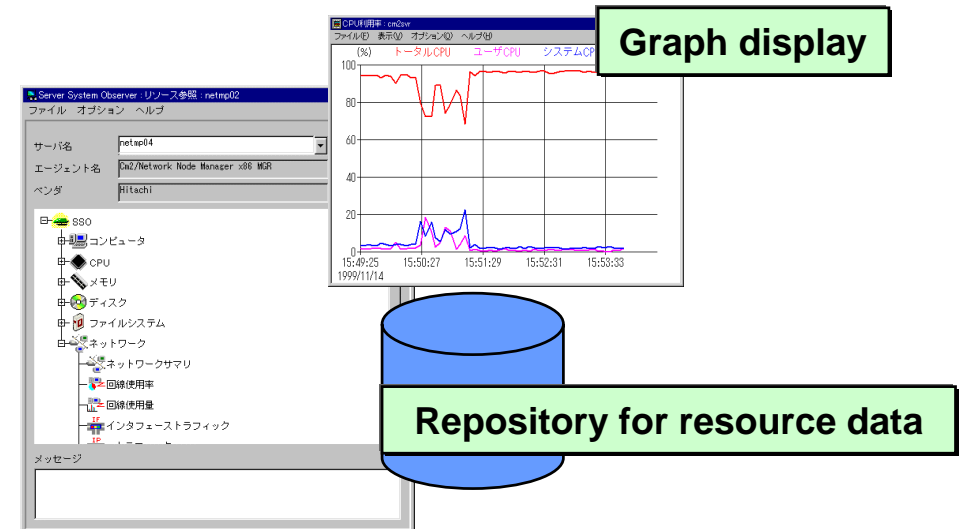
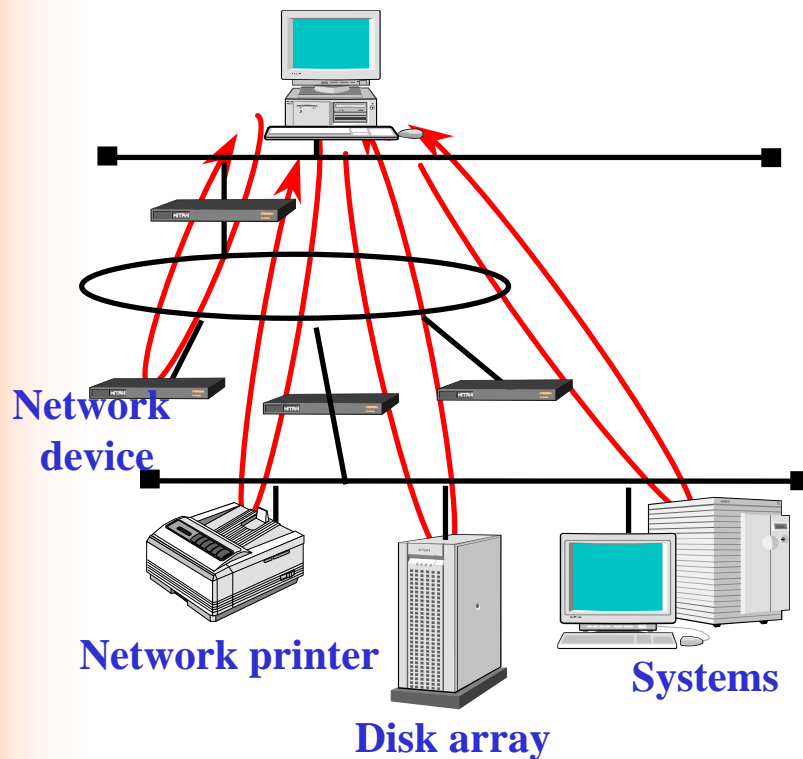
# Network Analysis & Monitoring



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## ► Real time performance monitoring

- ❑ Network resources - devices, topology, policies, traffic
- ❑ IT resources – processing, storage and printing



# Summary

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