



Empowered by Innovation

NEC

SDN is “Ready to go!”

Proven and Emerging Use Cases of Software Defined Network

ProgrammableFlow

Kaoru Yano

Chairman of the Board

NEC Corporation

Today's Agenda

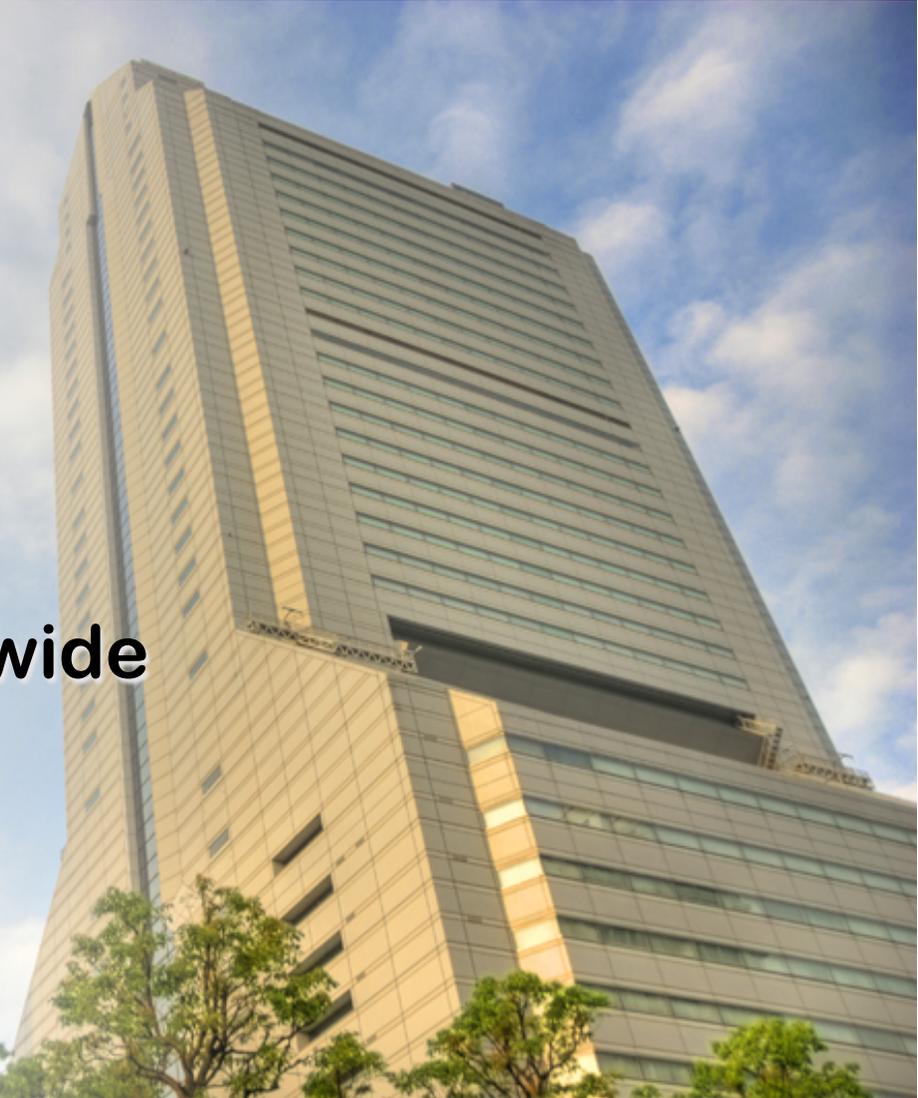
1. Introduction to NEC
2. What is SDN?
3. Real-world deployments
4. Closing

Introduction to NEC

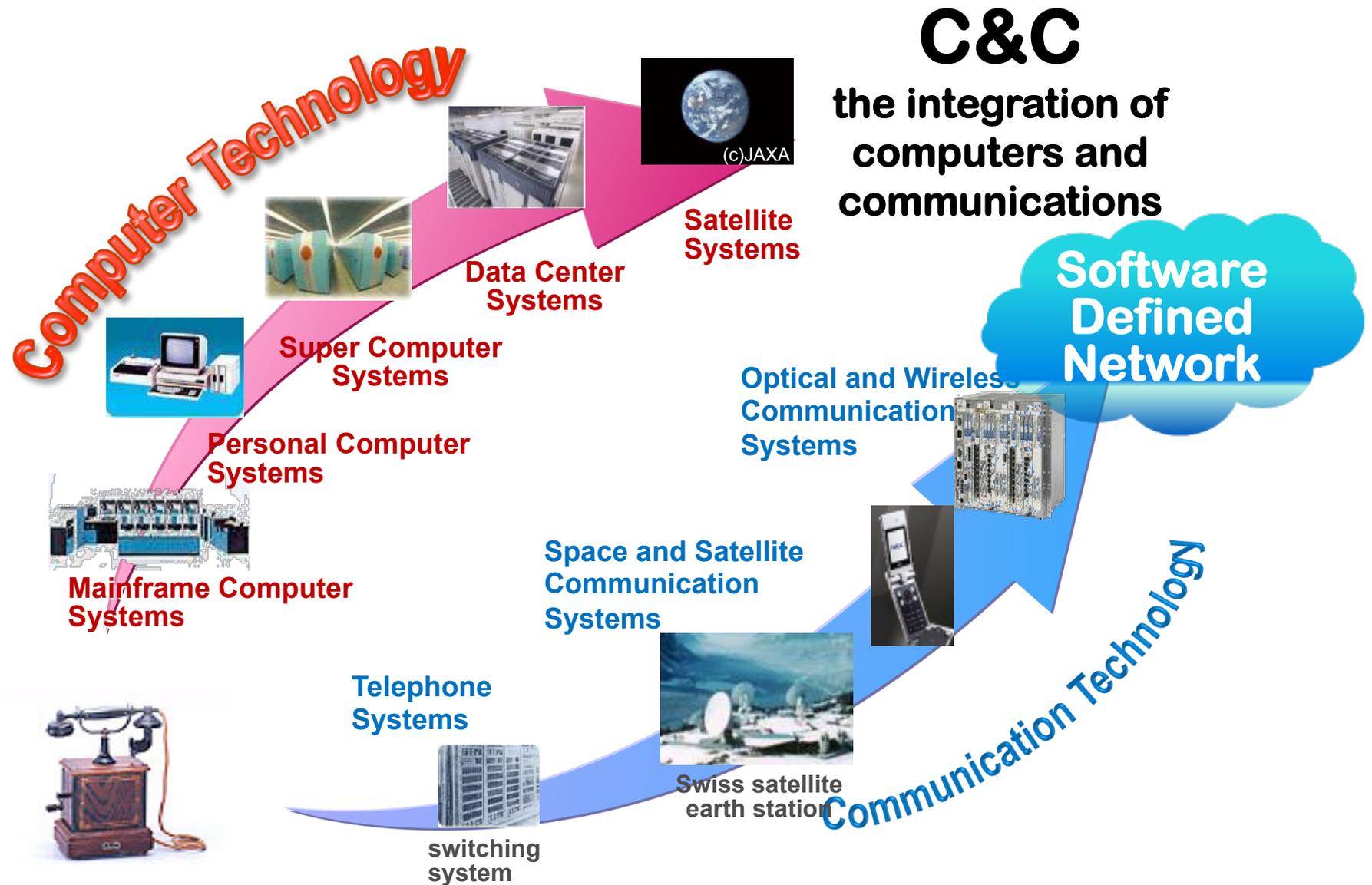
NEC Corporation Corporate Profile

- **\$38 billion Revenues**
- **116,000 Employees**
- **\$ 2 billion+ in R&D**
- **4 R&D centers Worldwide**
- **50,000 Patents**

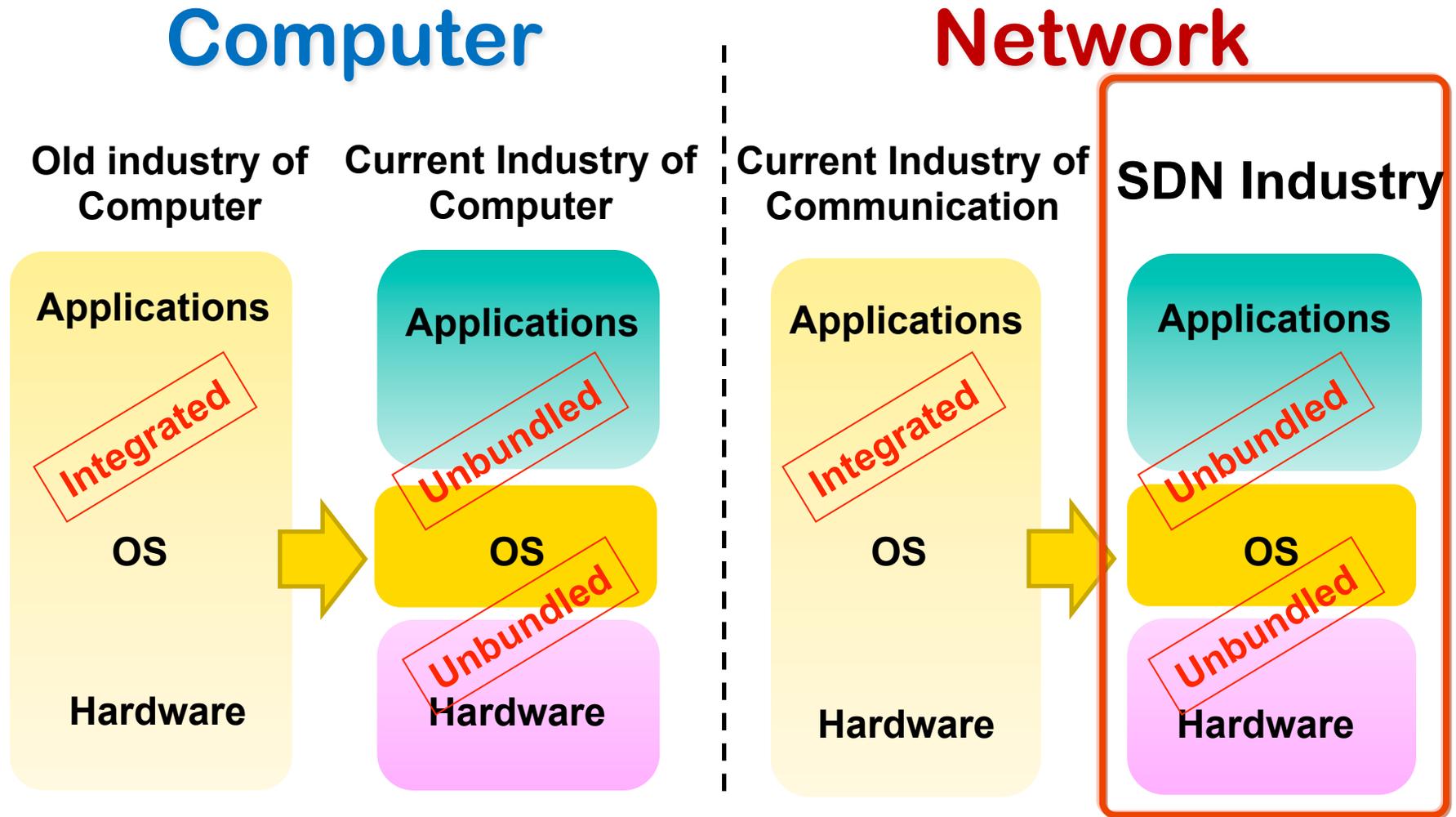
(as of 2012 March)



Contributing to the Development of an Information Society through "C&C"



'New OPEN era' – Triggered by OpenFlow



Early involvement in OpenFlow / SDN

- Active participation in OpenFlow/SDN specification and trials since the beginning of Stanford Clean Slate Program and contribution to ONF standard.

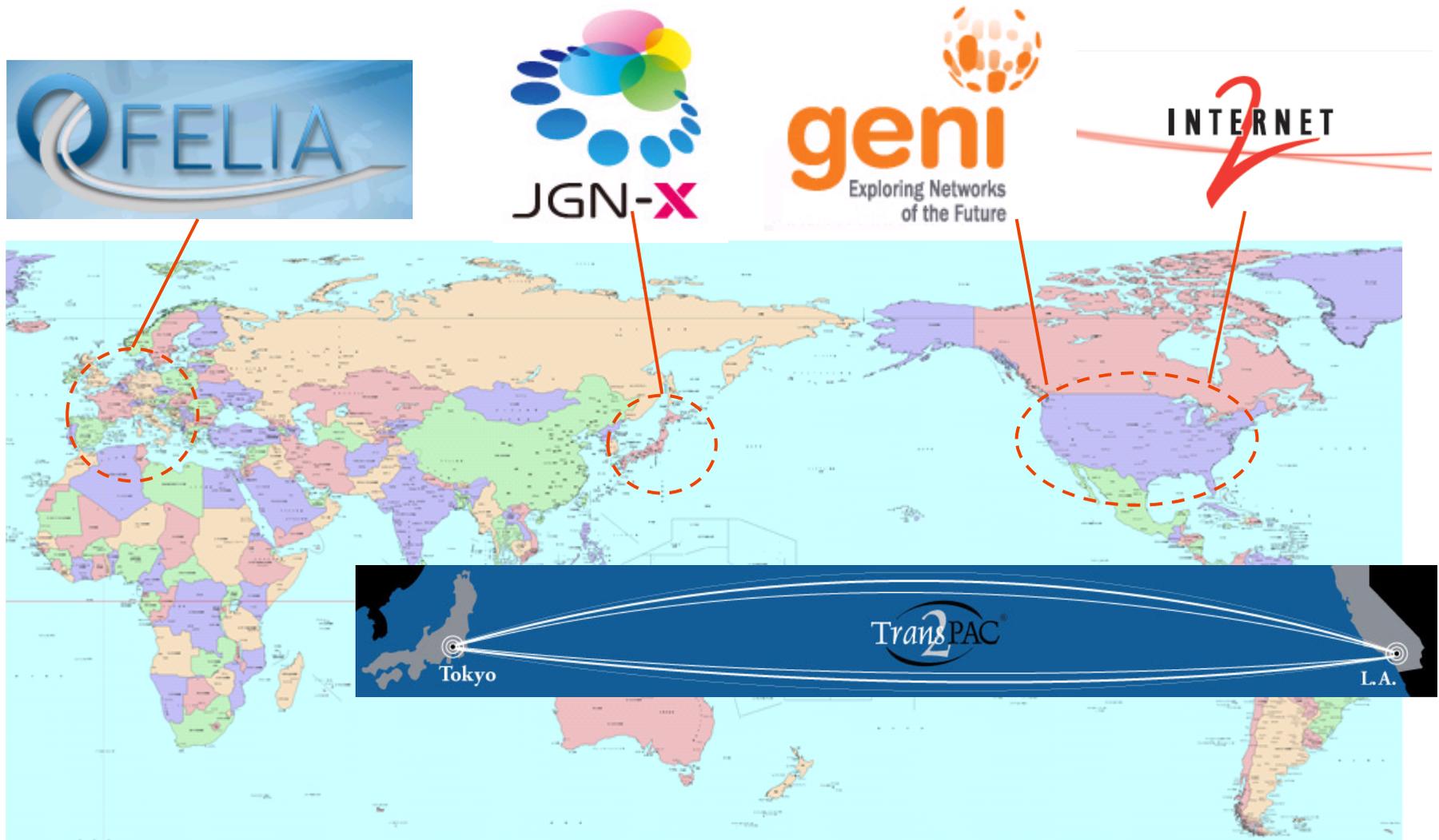


- Committed to continue pursuit of next-generation OpenFlow/SDN with Open Networking Research Center @ Stanford/UCB, and further contribution to ONF.

Open Networking Research Center
at Stanford University



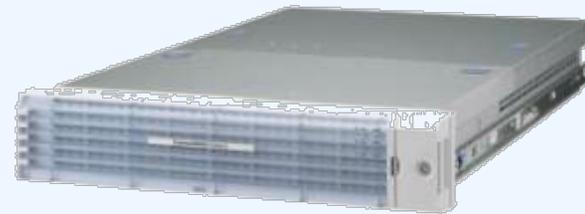
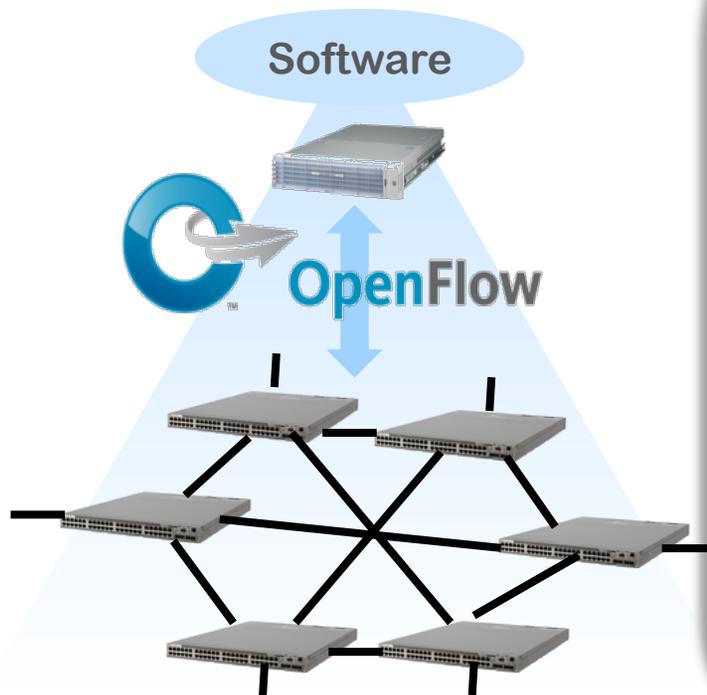
Best global knowledge of SDN



World's First SDN Commercial Products – 2011

ProgrammableFlow

Software Defined Network



Controller

PF-6800



Switch

PF-5240

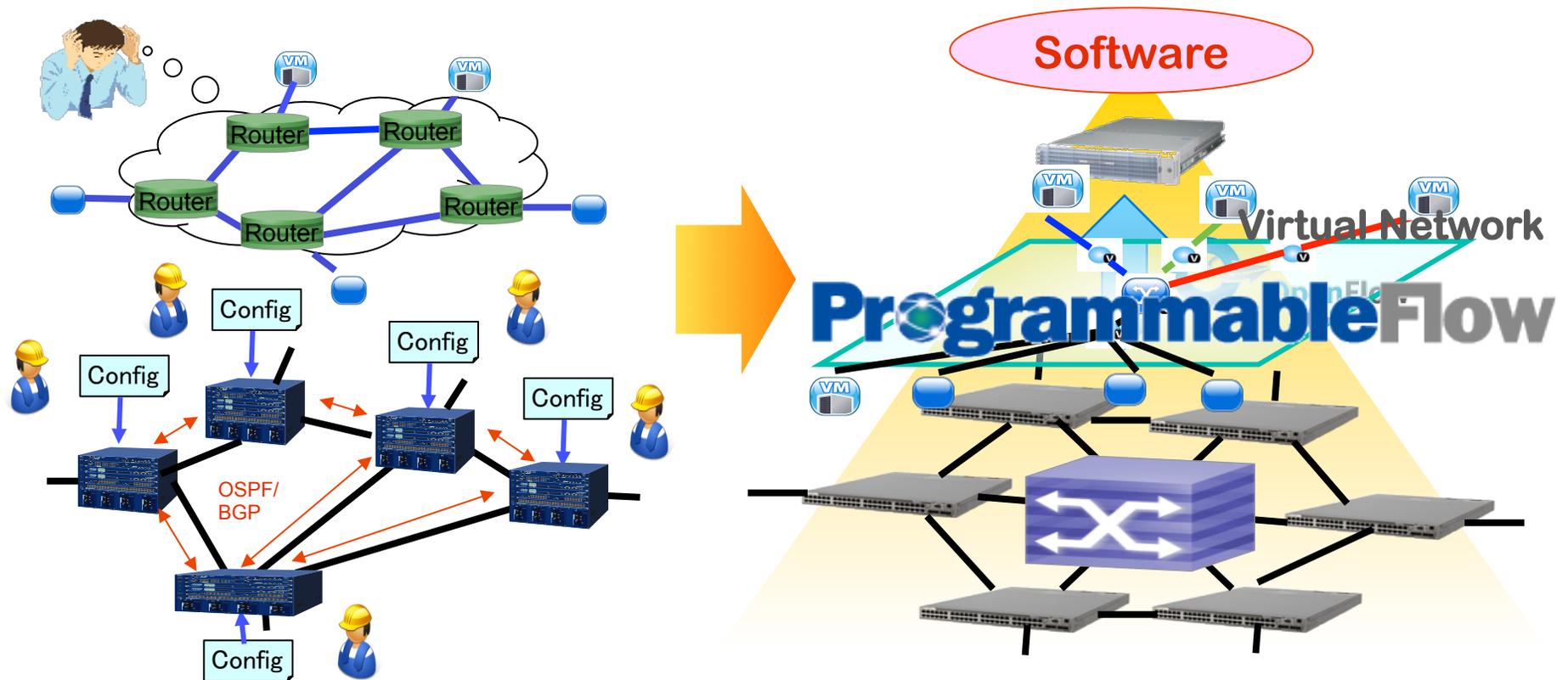
Awards for 'ProgrammableFlow' at INTEROP 2011



What is SDN?

Software Defined Network (SDN)

Distributed Autonomous Network Software Defined Network



Value of Software Defined Network

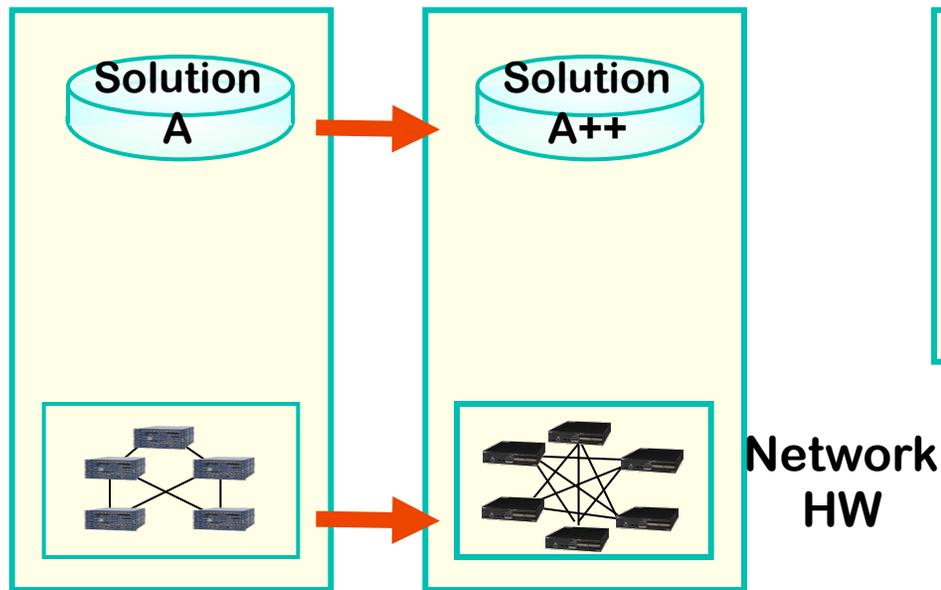
- Simple
- Fast
- Scalable
- Open

Value of Software Defined Network

- Solution upgradable anytime
- Business opportunity realize anytime

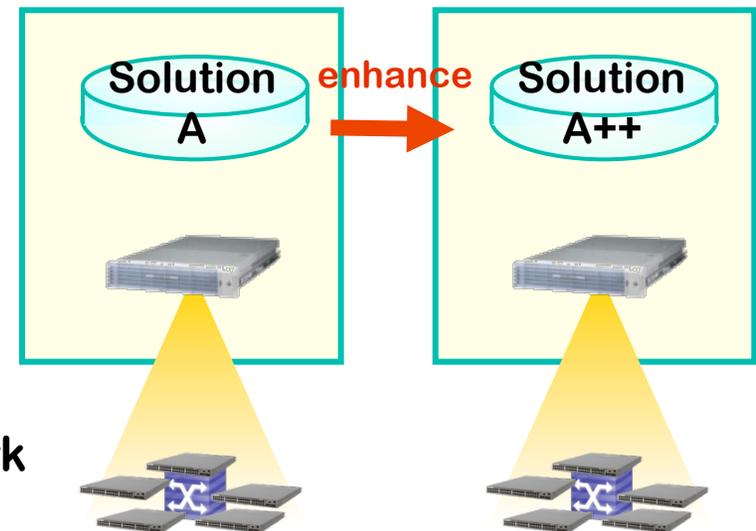
HW depend

**Enhance
at the same time**



HW Independent

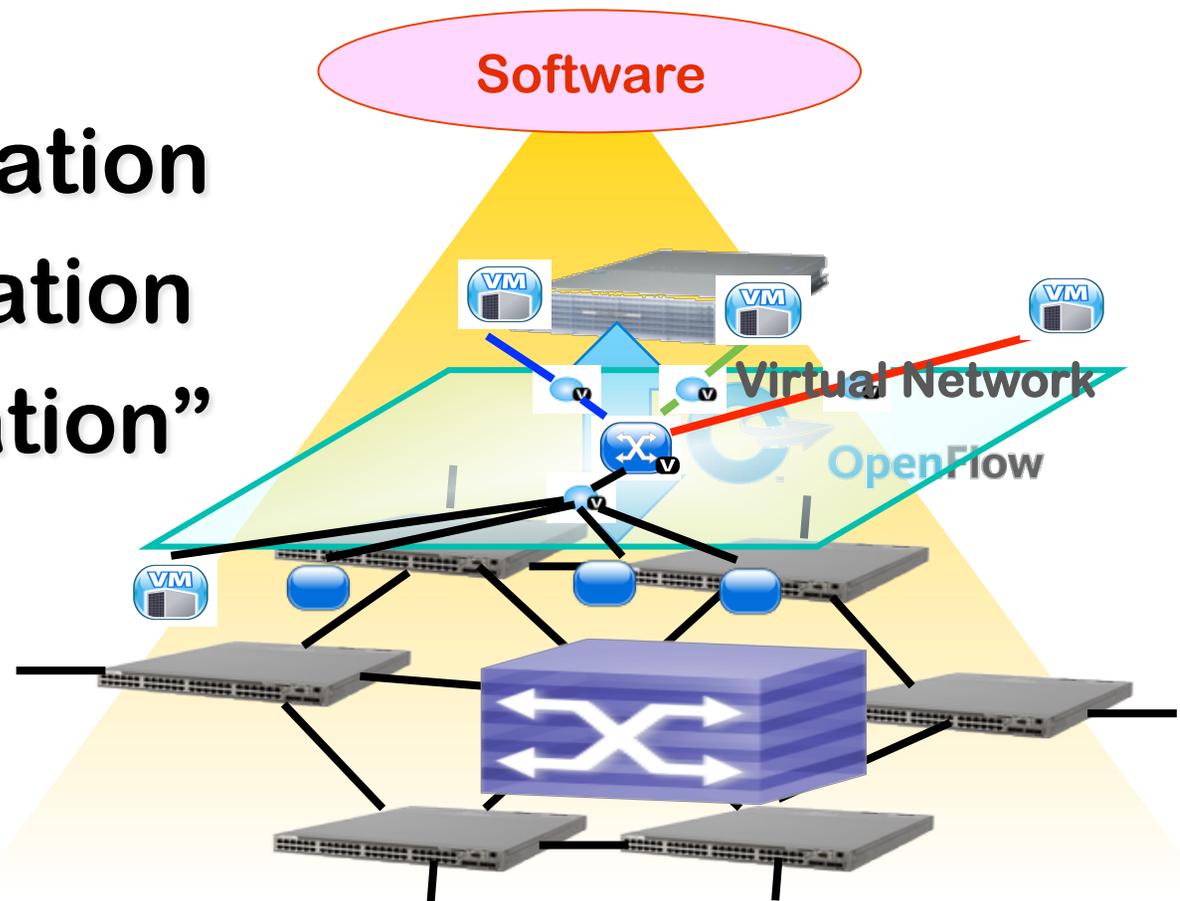
Enhance anytime



NEC's ProgrammableFlow is...

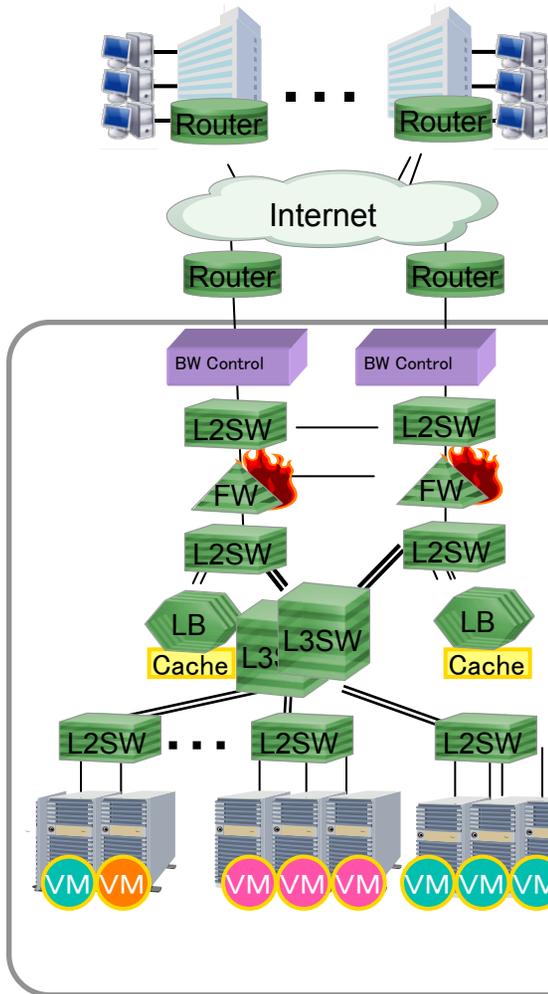
= “Software Defined Network”

= “OpenFlow
+ Simplification
+ Virtualization
+ Visualization”

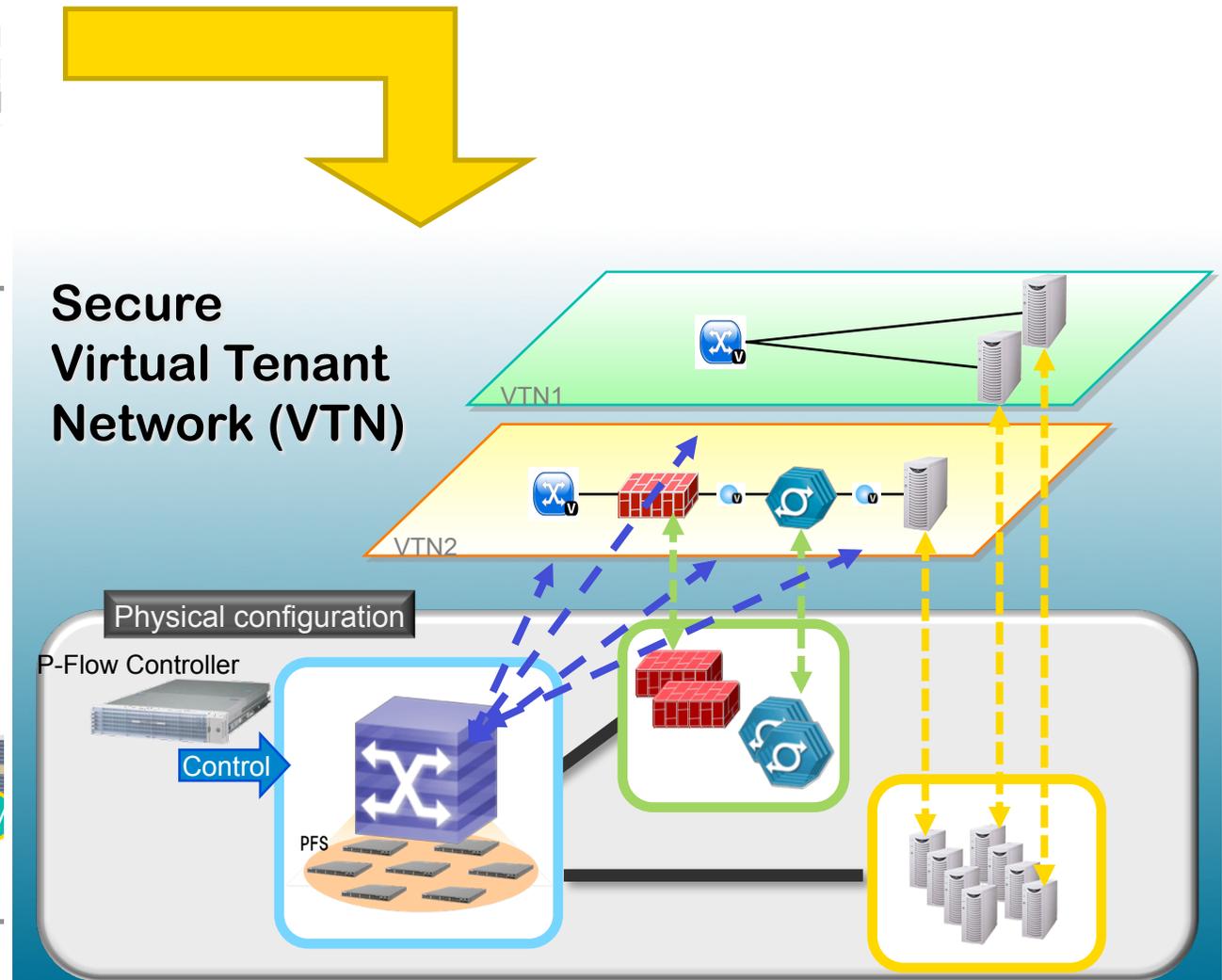


Virtual Tenant Network

Legacy NW Structure



Secure Virtual Tenant Network (VTN)



Applicable Markets

- Academy Network
- Data Center Operation
- Enterprise Network
- Telecommunication Carrier

Real World Deployments

Supply Record of **ProgrammableFlow**

- Academy Network
Government Lab (Japan), Universities (Japan)
- Data Center Operation
**Genesis Hosting (US), Selerity Corp (US), Tervela (US),
Housing Corp (Japan)**
- Enterprise Network
**Nippon Express (Japan), Bank (Japan), Hospital (Japan),
Trading Co. (Japan), Government (Japan),
Broadcasting Corp (Japan)**
- Telecommunication Carrier
Carrier (US and Japan),

and...

100+ systems are now under evaluation and trial.

Use Case

1. Genesis Hosting Solutions

2. Nippon Express Co.,Ltd.

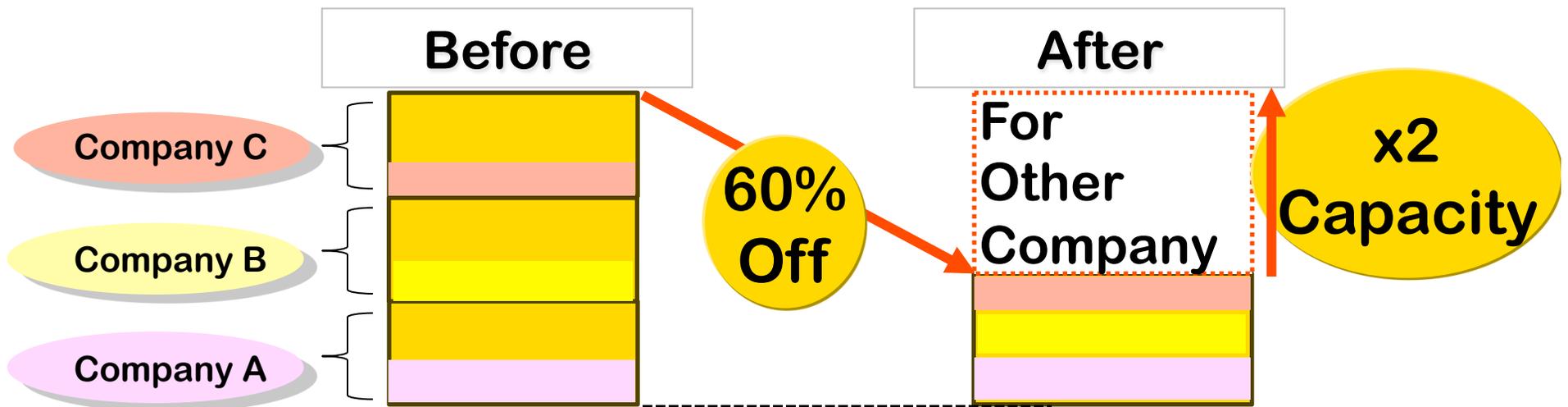
3. NEC's Software Factory

**4. A Major Carrier in Japan
(coming soon)**

Revenue UP

Flexible networking provide flexible Global-IP-Address assignment

- 60% reduction of Global-IP-Address
- x2 customers capacity
- 100h/week reduction for Service delivering



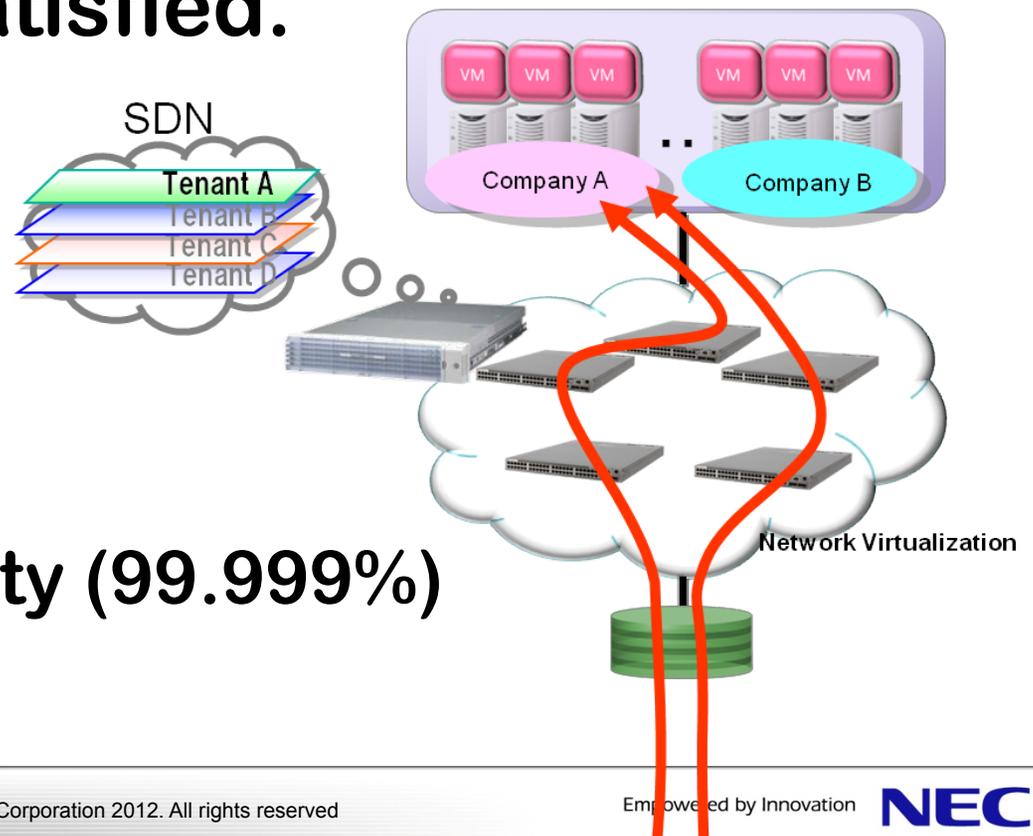
Message from Customer



Multi-tenant-Networking by ProgrammableFlow gives Genesis Hosting revenue increase.

Genesis Hosting satisfied.

- Multi-tenant
- Simple Network
- Keep High Availability (99.999%)



Limited network and virtualization flexibility.

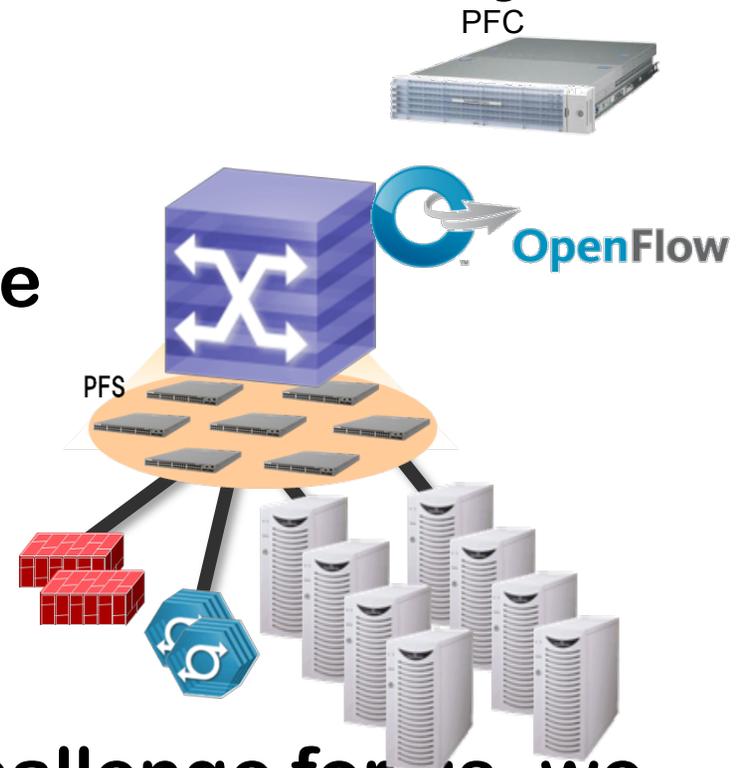
Needed a new paradigm
in networking.

(Reduce service delivery time
and cost reduction)

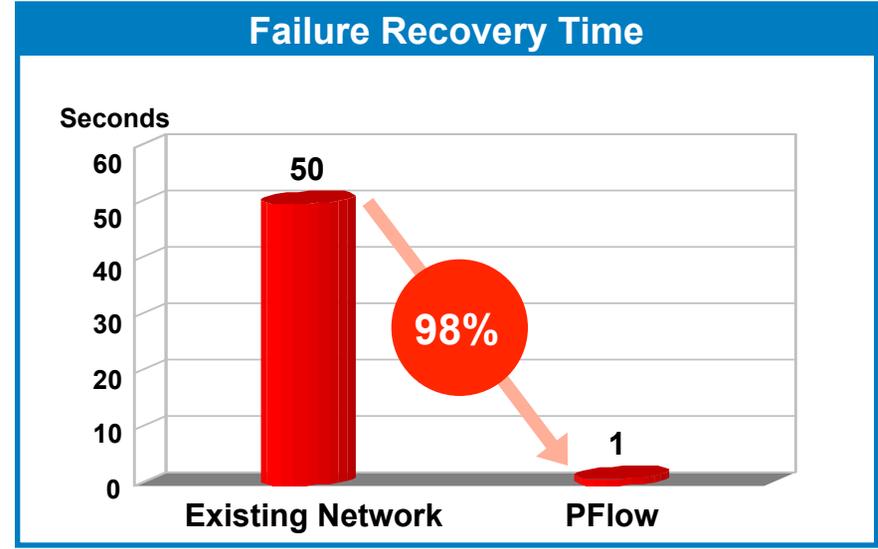
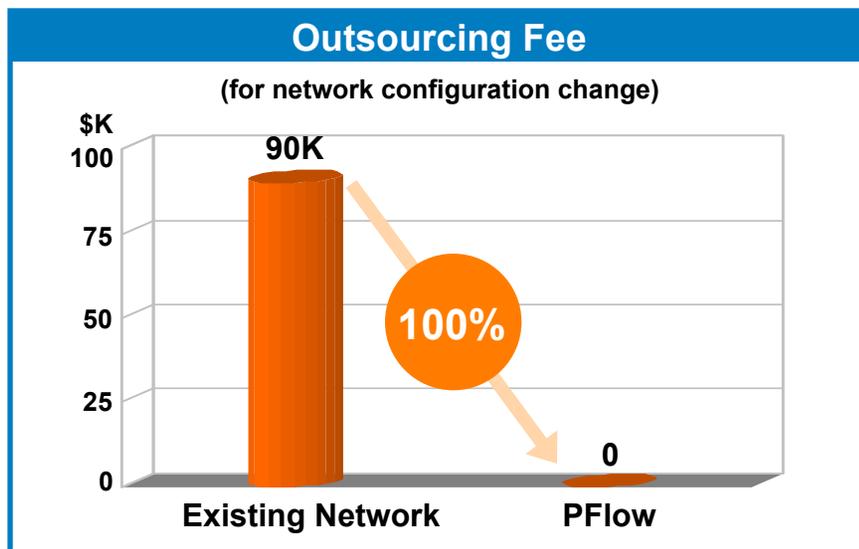
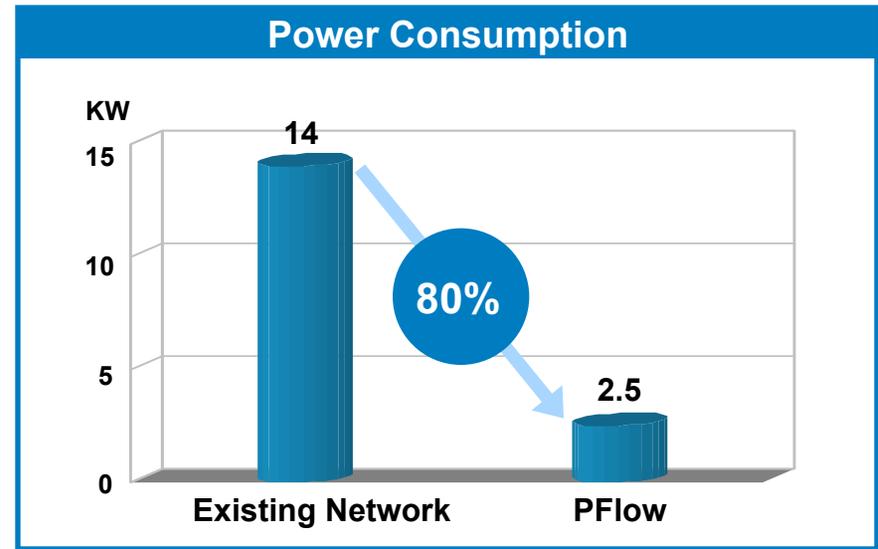
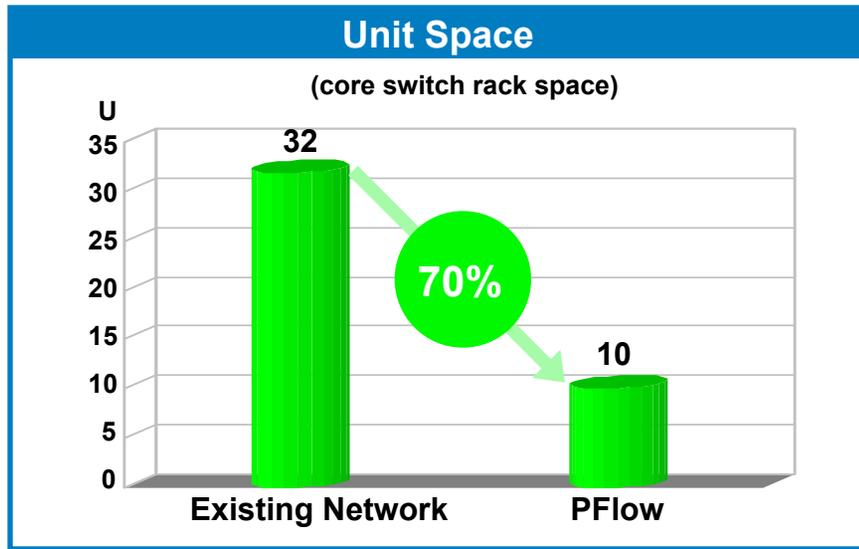


Message from Customer

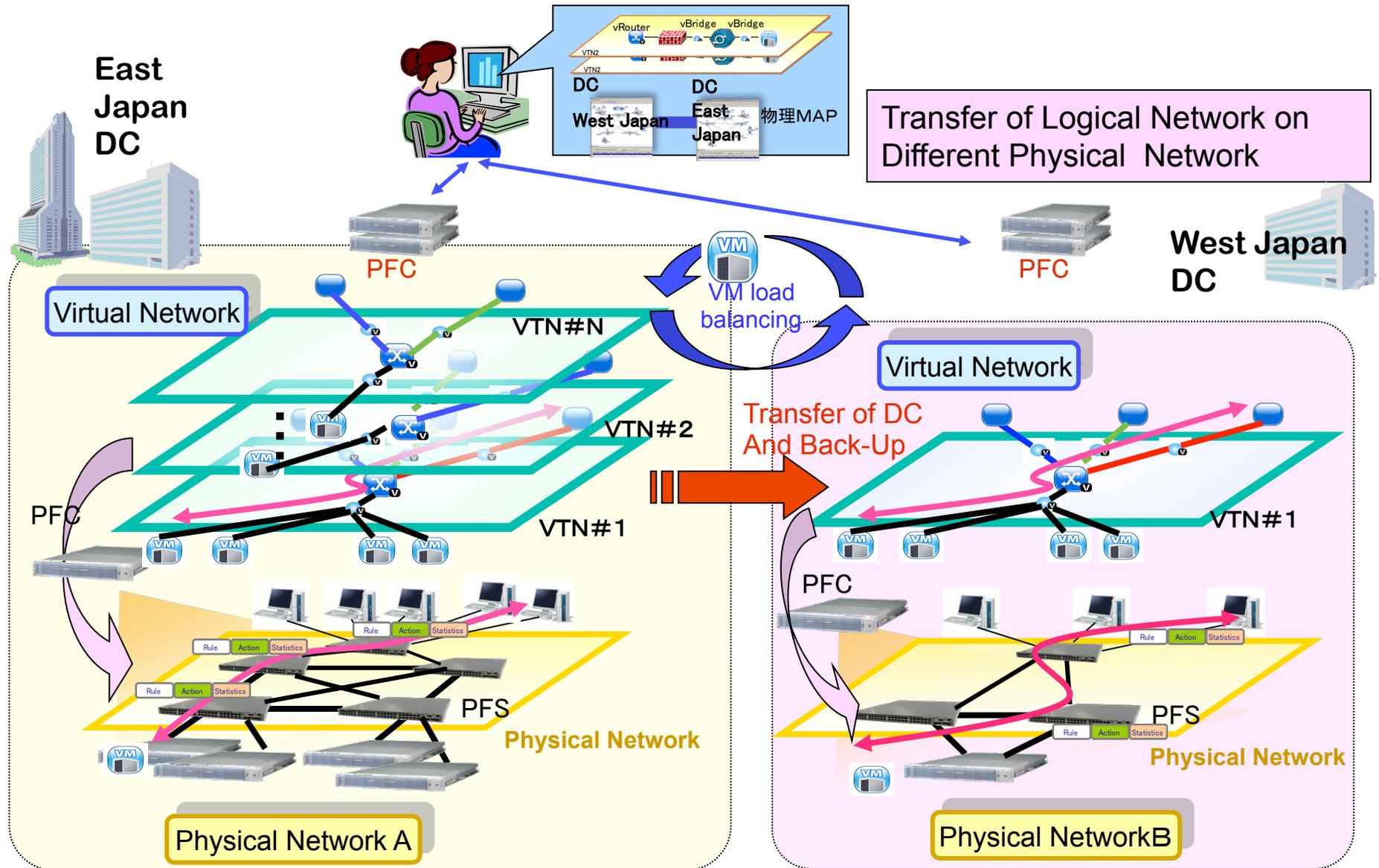
Although this was a big challenge for us, we
are happy that we believed in the potential of
ProgrammableFlow.



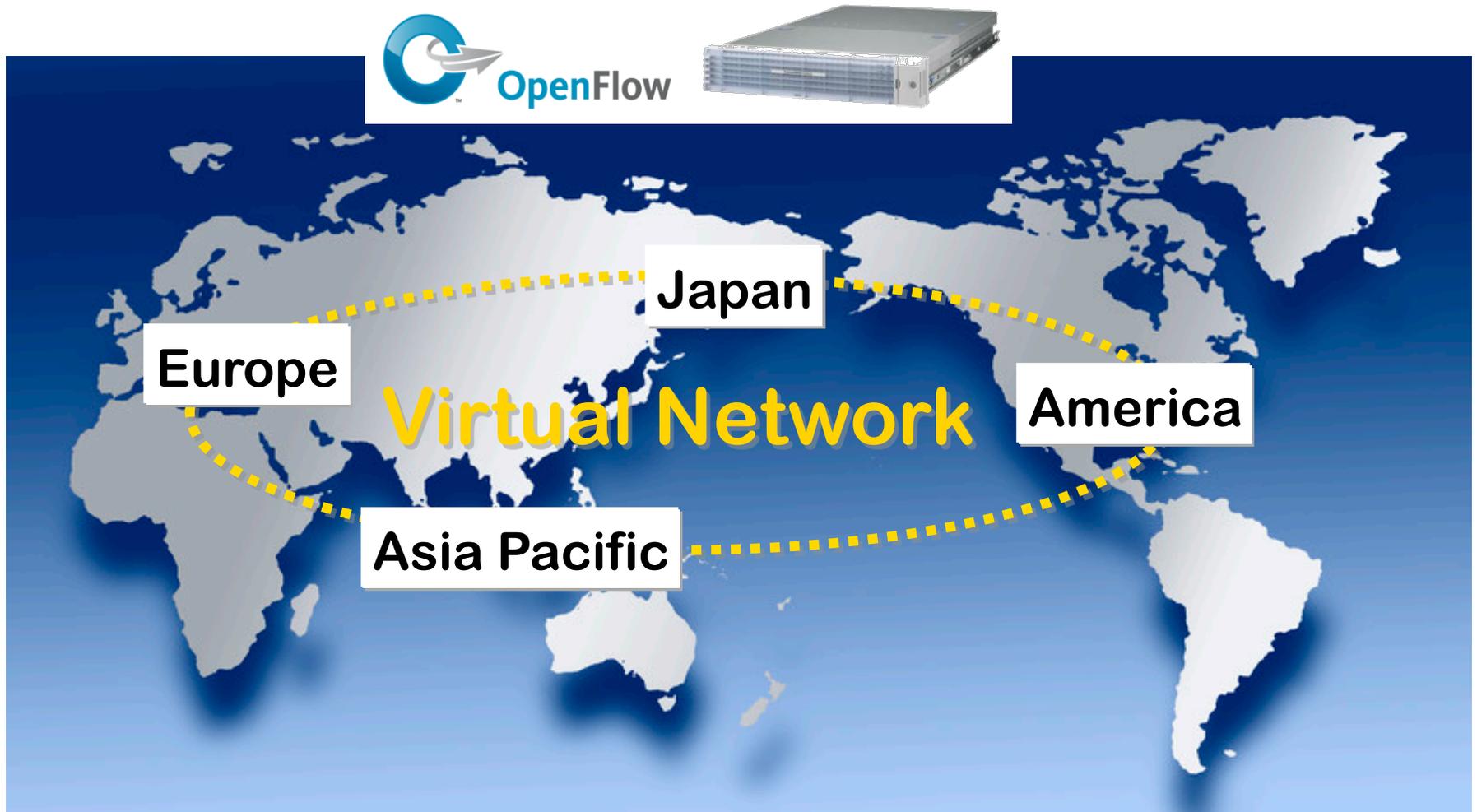
Nippon Express benefits from ProgrammableFlow



NEC Internal – Multi-Purpose Data Center



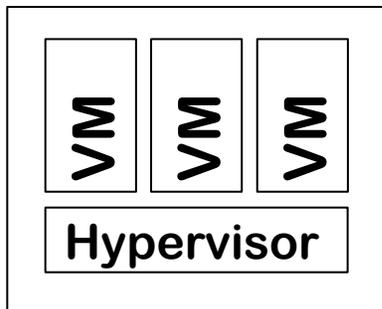
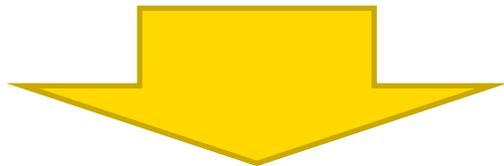
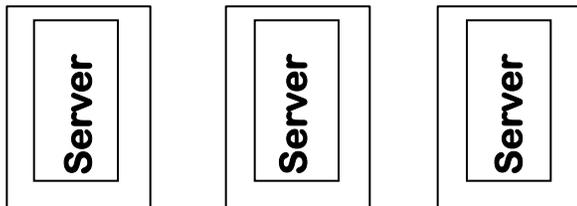
Coming soon by one of Japanese Carrier



Now!! Network Hypervisor

8 years ago

System-1 System-2 System-3

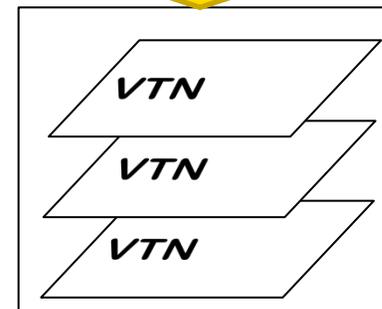
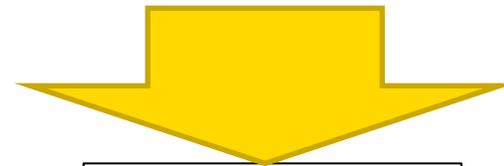
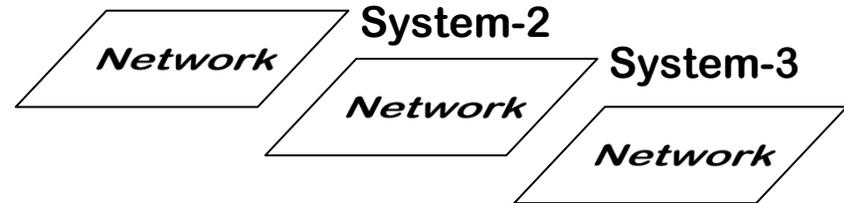


Now !!

System-1

System-2

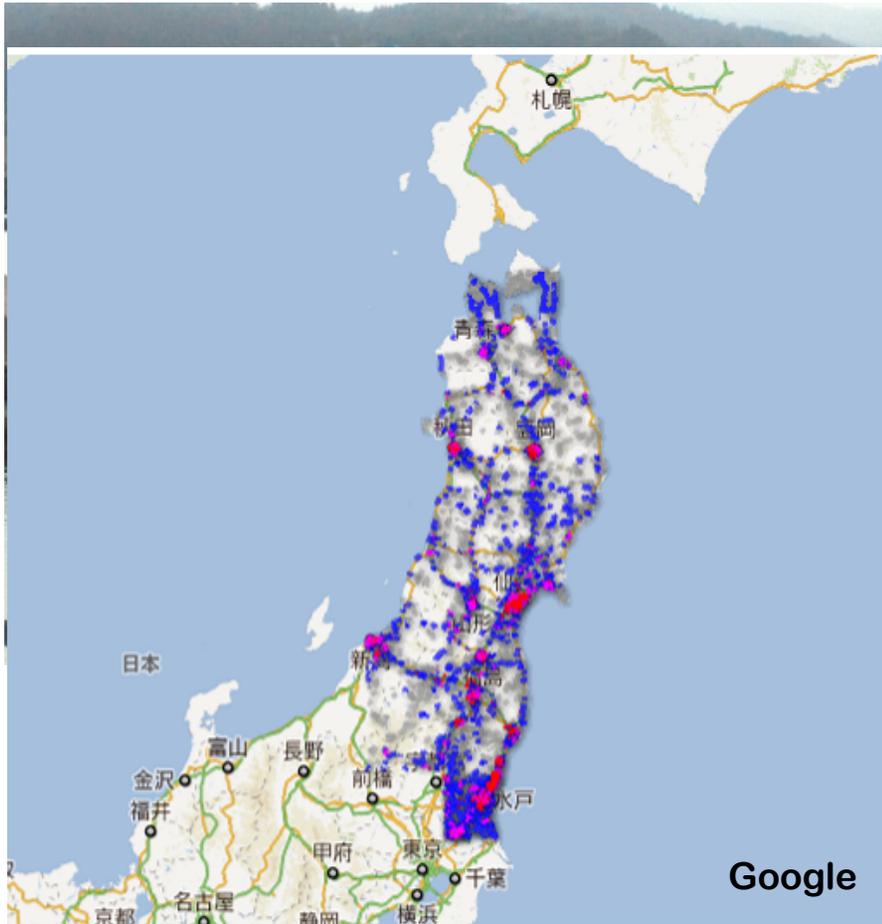
System-3



Network Hypervisor

Closing

In last March, huge disaster attacked Japan. But...



Various ICTs Supported recovering from disaster

**NEC will continue to innovate C&C
for ‘Open Networking’
communities and societies.**

An information society friendly to humans and the earth

A woman and a child are running joyfully in a green field, holding a large white cloth that is flying in the air. The background shows a clear sky and distant buildings.

Friendly to Humans

An information society that realizes a safe, secure, convenient and rich life with services anyone can use

Friendly to the Earth

An information society that enables co-existence with the global environment and sustainable growth by efficient use of limited resources

Empowered by Innovation

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