Empowered by Innovation NEC

Telecom Carrier Business Mid-Term Growth Strategy

October 22, 2013

Shunichiro Tejima,
Executive Vice President
NEC Corporation

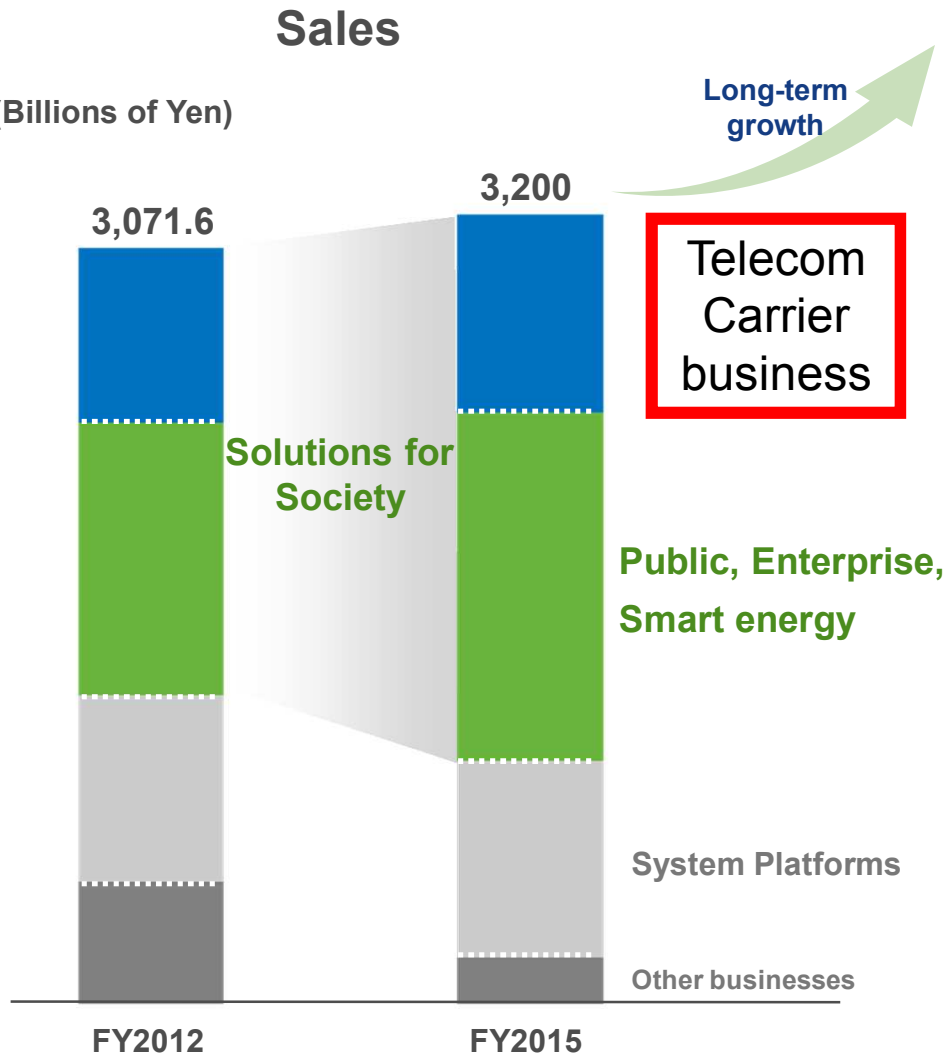
Contents

Mid-Term Management Plan 2015

Focus on Solutions for Society

- **Supporting the advancement of social infrastructure and systems throughout the world via ICT**
- **Create new business models with the understanding that social problems provide an opportunity for growth**

Transformation into a social value innovator

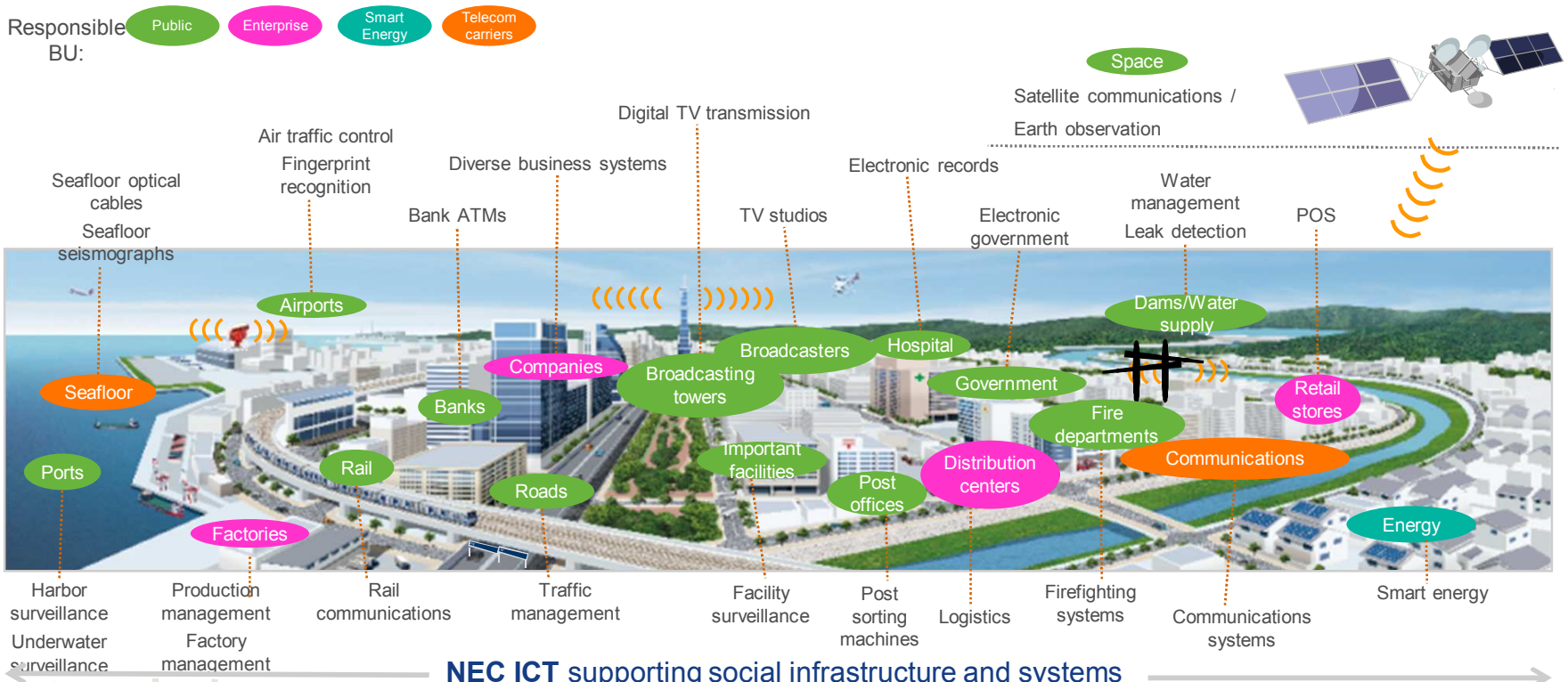


Forecasts as of 26 April, 2013

Innovation of Social Infrastructure via ICT

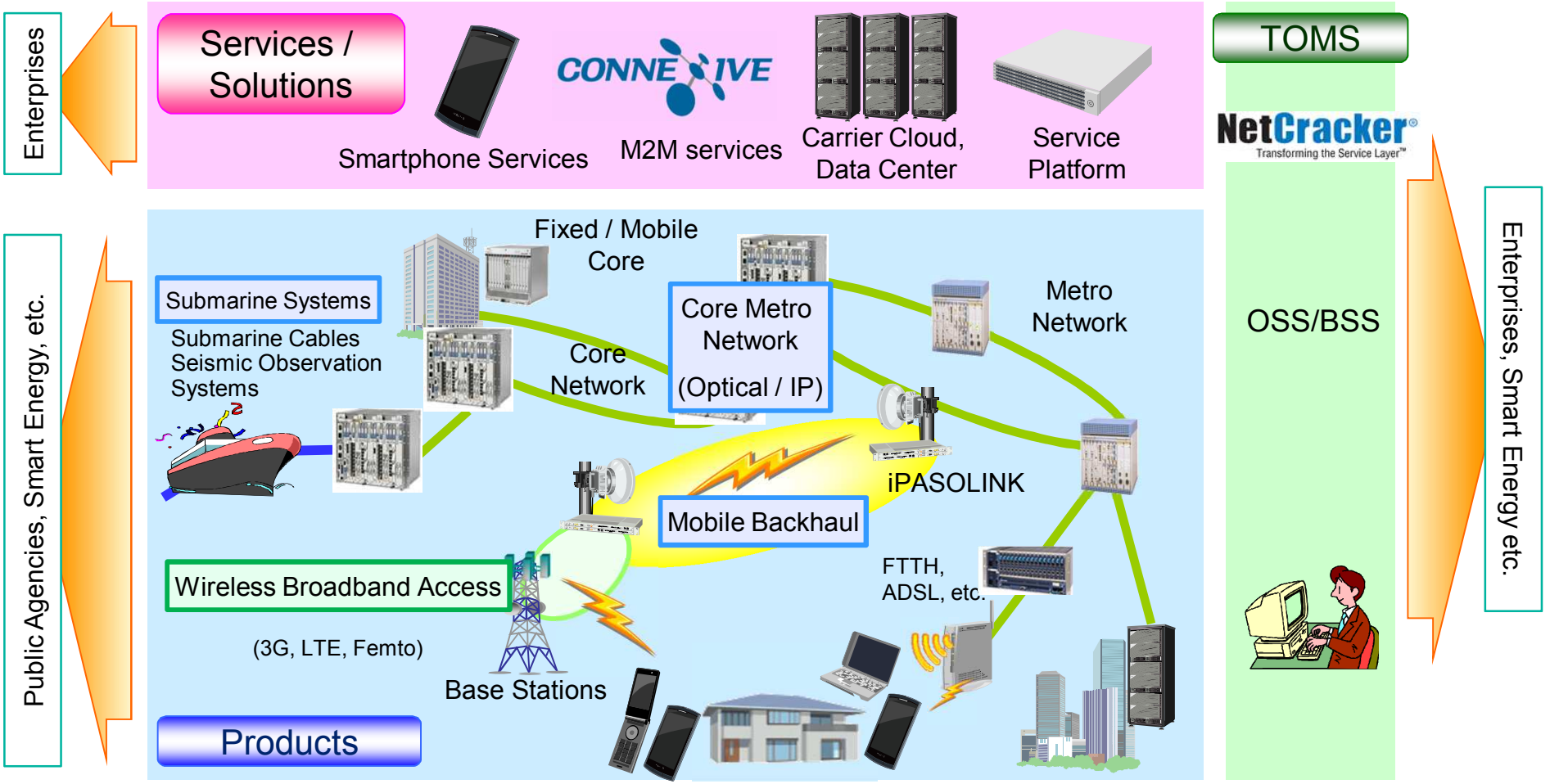
Leveraging our proven results and strong position for global expansion

- From the seafloor to outer space, concentrating management resources in areas in which social infrastructure will be innovated by ICT



Mission & Business Domains of the Telecom Carrier BU

Provide IT/Network products, services and solutions from the entire NEC Group to Telecom Carriers and other customers

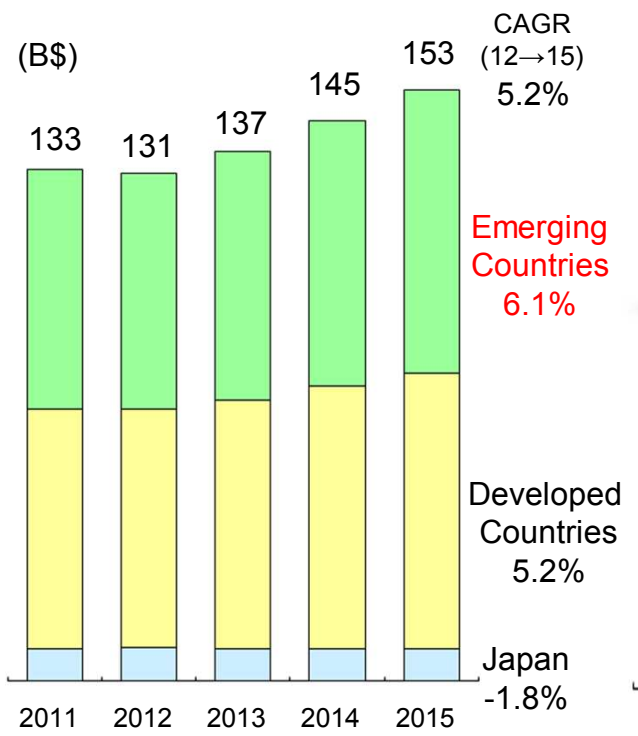


Contents

Market Environment

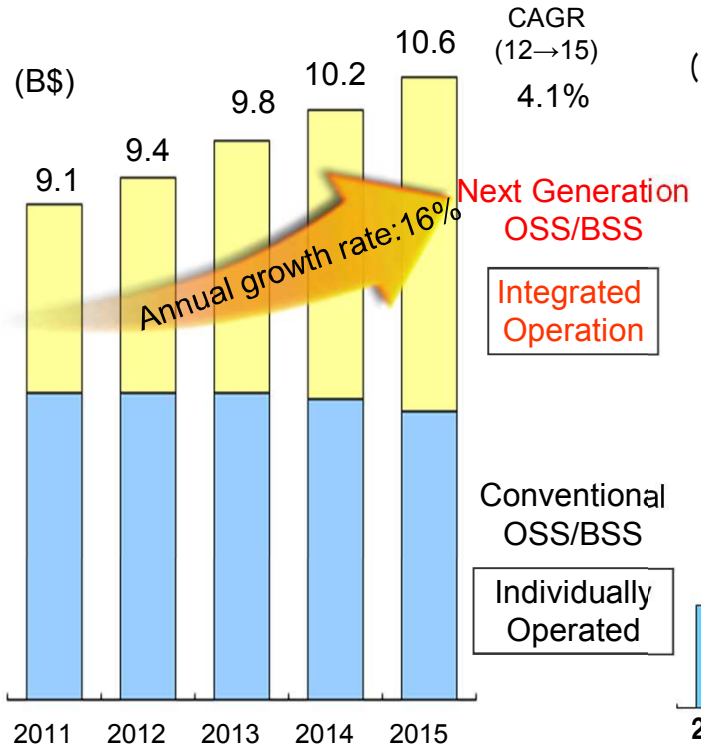
- Growth in emerging countries and other overseas markets
- Stagnancy and increasing borderless competition in the Japanese market
- Improvement of capital investment/operational cost efficiency; Opportunities in the TOMS and SDN Markets

Capital Investment by Carriers



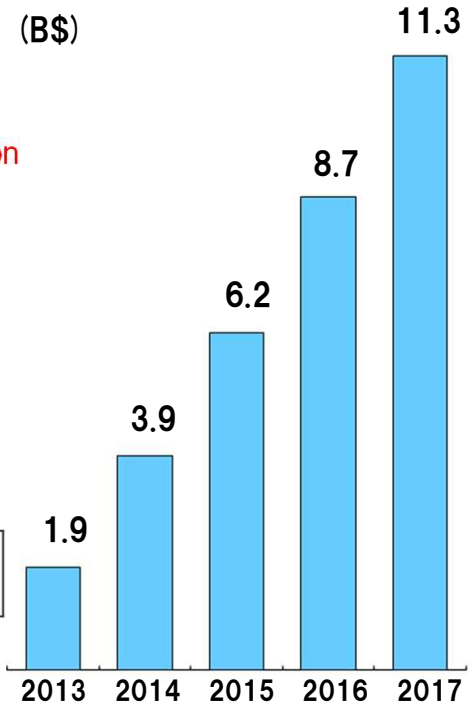
* Gartner. Forecast: Carrier Network Infrastructure, Worldwide, 2010-2017, 3Q13 Update (September 2013)
Forecast: Telecom Operations Management Systems (BSS, OSS and SDP), Worldwide, 2010-2017, 3Q13 Update (September 2013)

TOMS Market



Estimates made by NEC

SDN & NFV Market for Carriers



* Gartner. Forecast Overview: SDN and NFV in Carrier Infrastructure, Worldwide, 2013 (7 October 2013)
Chart created by NEC based on Gartner data.

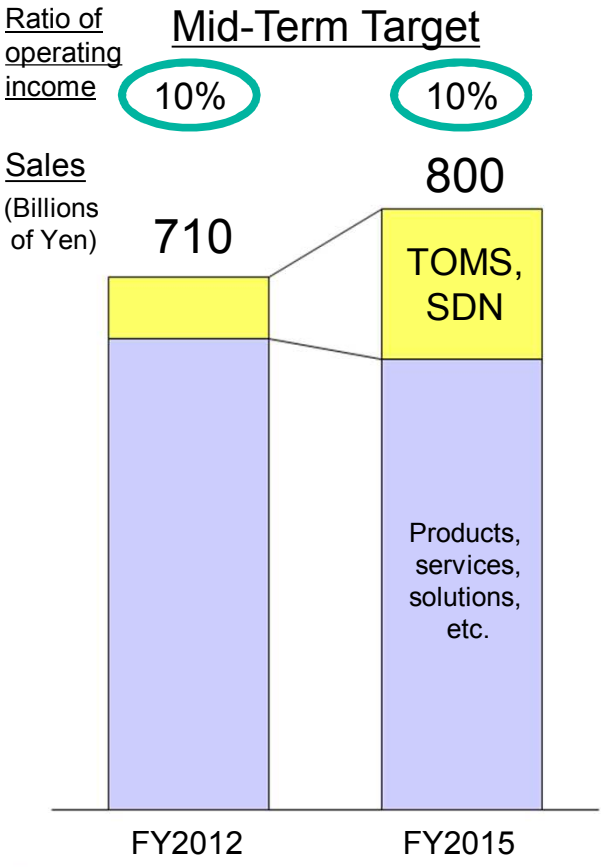
Network Environment Changes and Growth Opportunities

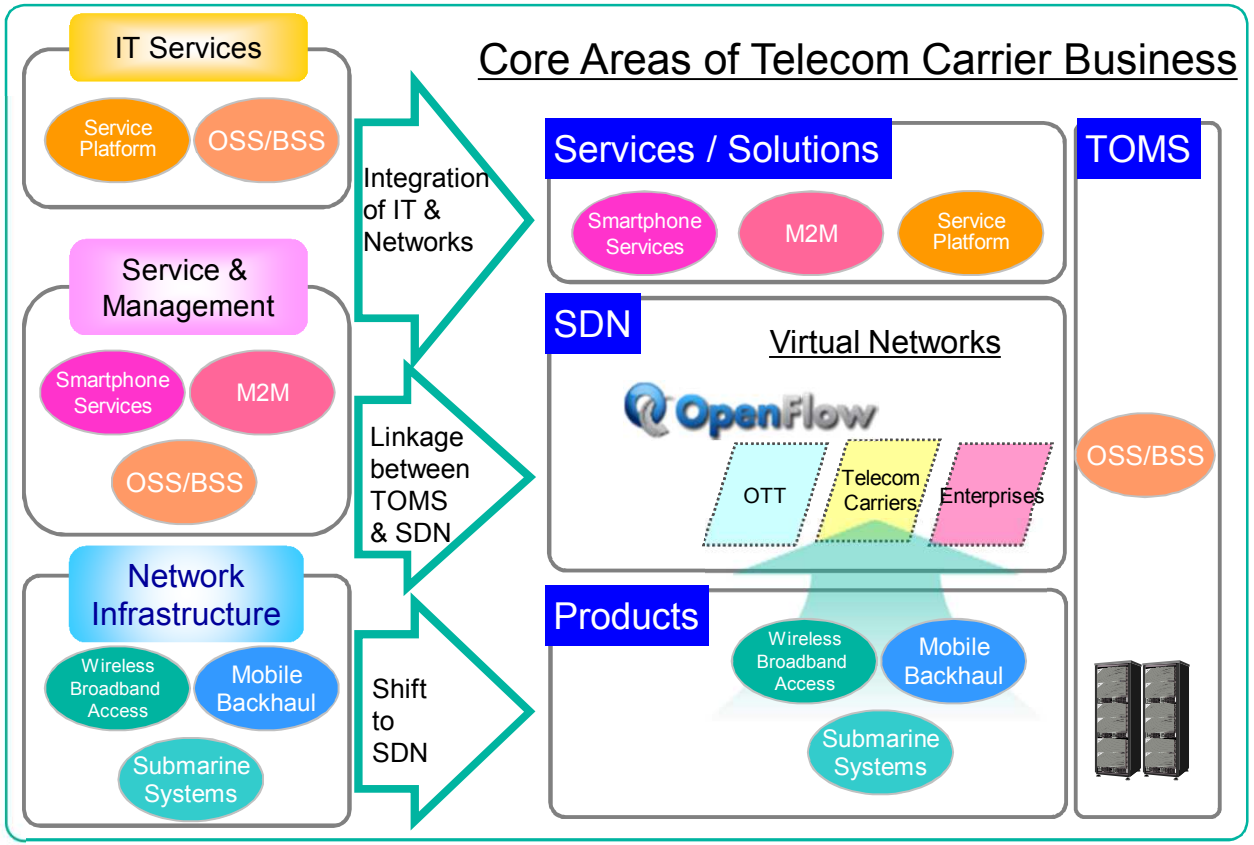
Environment Changes	Technology & Service innovation	Societal demand	Escalation of competition	Diversification of services
	Development of ICT technology, Addition of services, Rapid increase of traffic	Reduction of global environment load, Enhancement of resiliency	Fee reduction, Flat rate	Competition with non-carrier, Rise of OTT service at global level
Challenge/ needs to network & network products	• Respond to advanced functionality of terminals • Utilize high speed, high capacity technology • Utilize M2M technology • Utilize maximum use of resources	• Power saving • Respond to extensive disasters • Respond to security and safety issues	• Economic efficiency of investment • Mitigation of operation cost	• Flexibility & scalability for service offering • Monetization of non profitable traffic
Growth opportunity	Enhancement of network operation and management (TOMS) Transformation of carrier's network architecture (SDN)			

Mid-Term Target and Strategy for the Telecom Carrier Business

Mid-Term Strategy

- Maintain position as a top vendor in Japan
- Achieve global growth with TOMS and SDN as the main pillars
- Unify IT & network technologies to create customer value





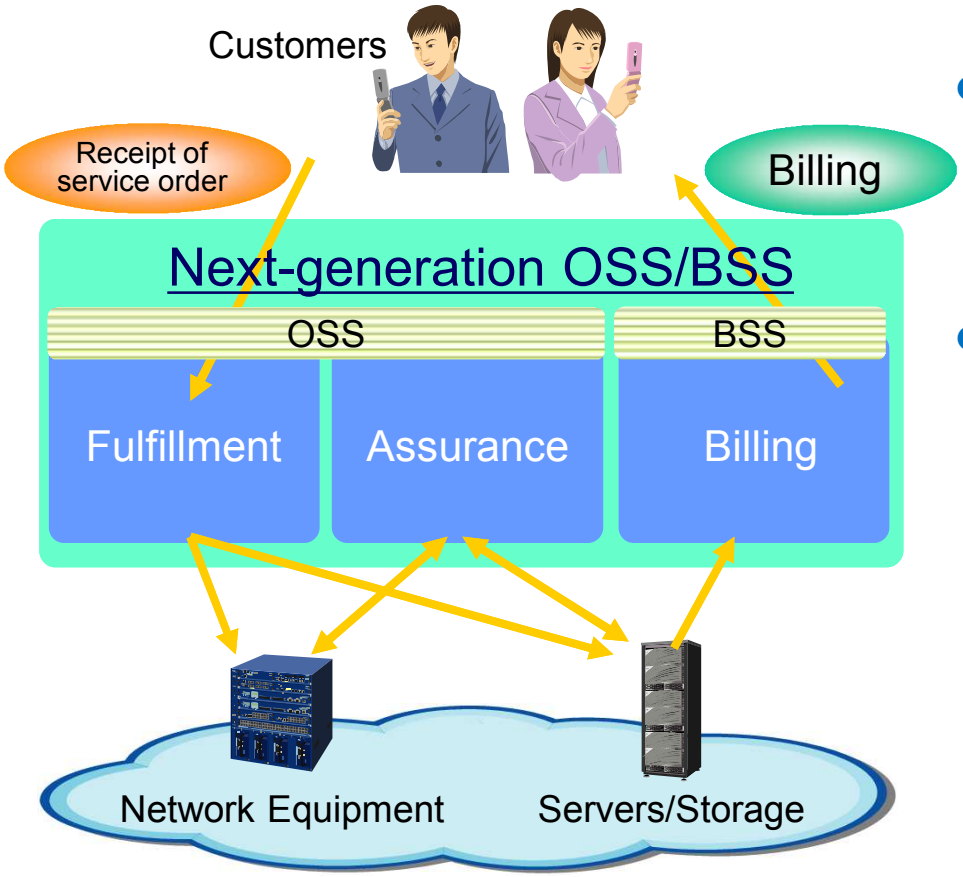
Forecasts as of 22 October, 2013

Contents

TOMS

TOMS Overview

- Telecom Operations Management Systems (TOMS) are comprised of OSS and BSS
- Next-generation OSS/BSS will enable end-to-end automation from the receipt of a service order to billing



- OSS: Operation Support Systems

  Operation support systems are used to improve the efficiency of management resources used to provide communications services.

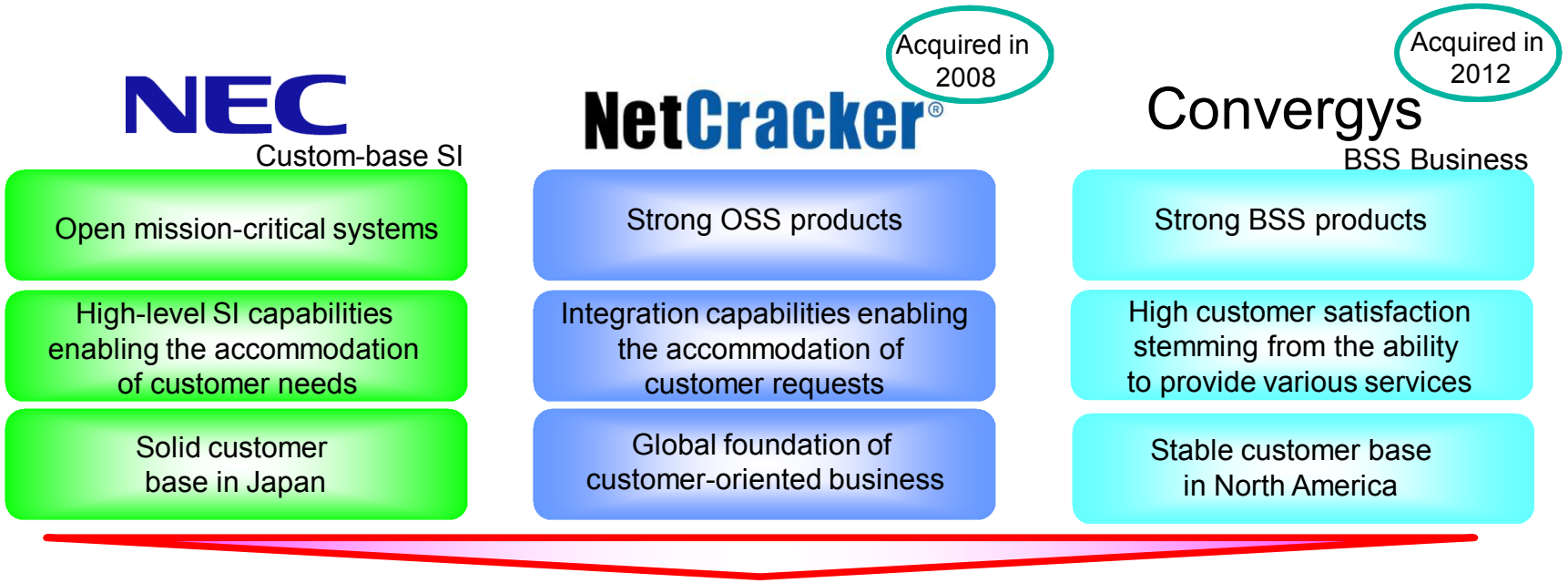
- BSS: Business Support Systems

  Business support systems are used to facilitate better business management.

- Automate the end-to-end business process from service order receipt and service provisioning, to bill issuance for customers

NEC's Advantages in the TOMS Market

- Strong OSS/BSS products and strong technical capabilities in the area of open mission-critical systems
- Advanced solutions and services provided by approximately 7,000 staff globally
- Customer base of more than 250 companies in 58 countries



Integration of these advantages will drive NEC to become the market leader

Product Strength & Organization for Global Solution Provision

Product Strength

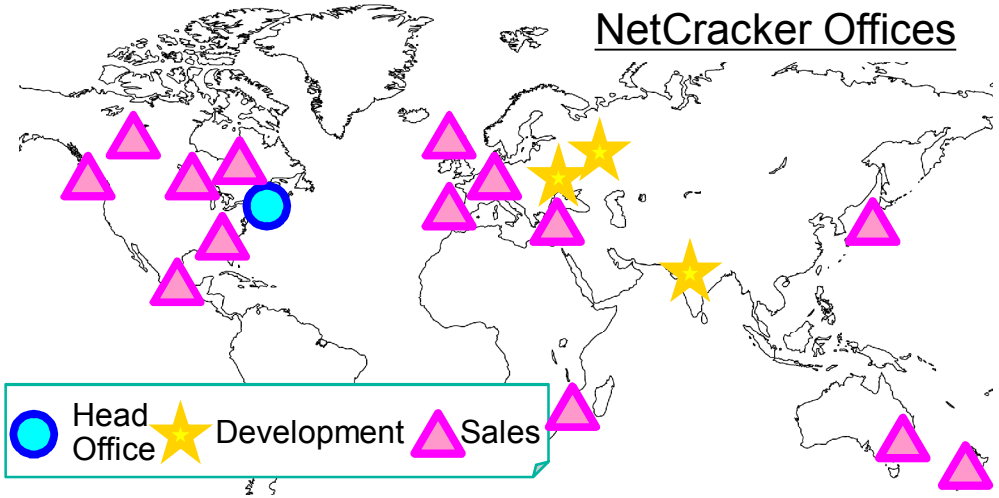
NetCracker Technology has been positioned as a leader in a report published by Gartner.

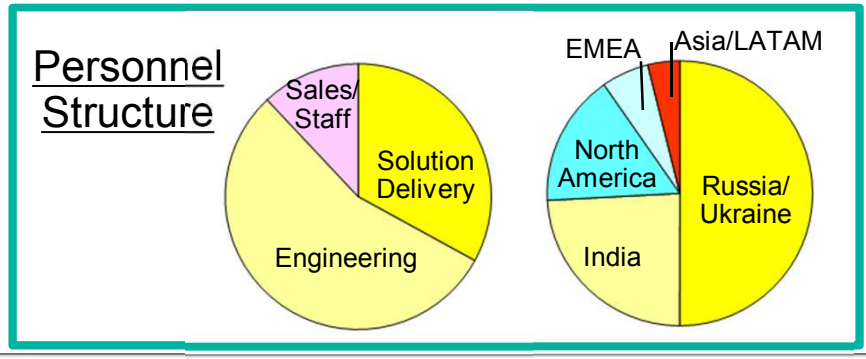
* Gartner. Magic Quadrant for Operations Support Systems by Martina Kurth (24 October 2013)

** This chart was updated to the latest edition on January, 2014

Organization for Solution Provision (NetCracker)

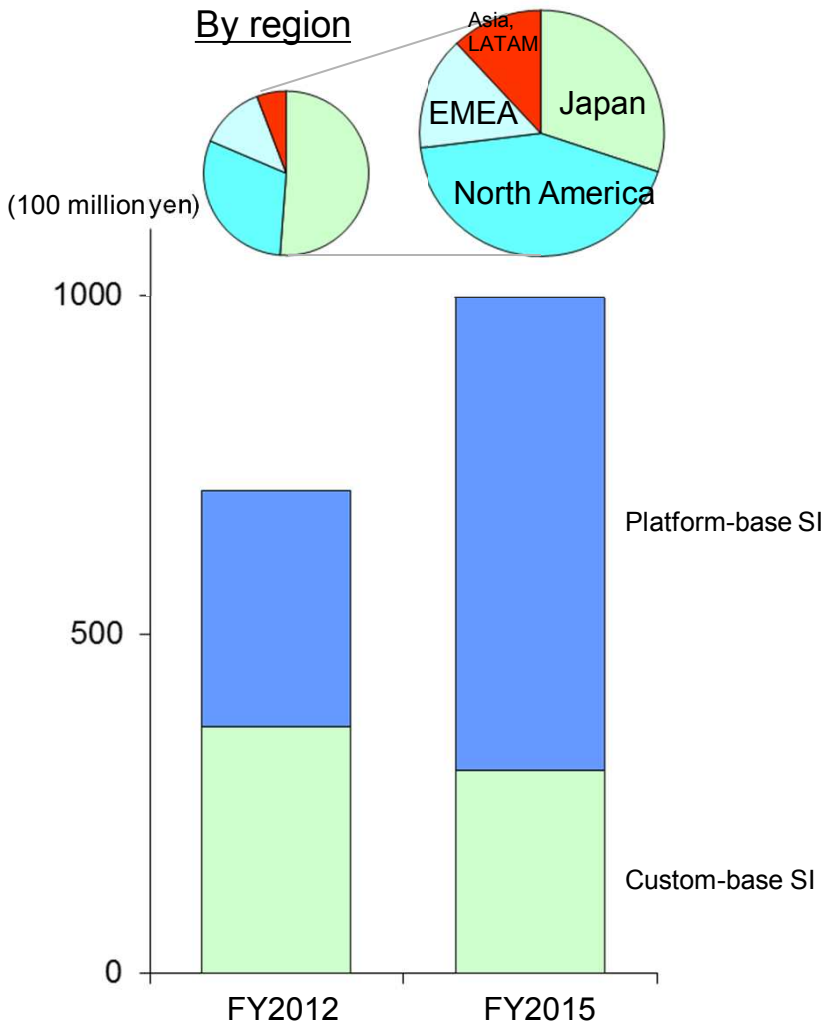
Through optimal placement of resources around the globe, NetCracker is able to provide advanced solutions and services.
(System integration, managed services)





TOMS Business Strategy

Sales Plan



Business Strategies

- Promote the evolution to a single, common platform (one to many business model)
  - Released the first single, common platform across all OSS/BSS products, with SDN readiness functions (TOMS 9.0)
  - Continue enhancement of platform
  - Apply platform to the custom-base SI projects
- Expand new customer base
  - Expand BSS sales to utility providers by strengthening billing engines
  - Expand sales of TOMS through NEC's international subsidiaries (Asia, LATAM, etc.)
- Build long-term relationships with customers through provision of managed services
  - Expand managed services leveraging the acquired Convergys BSS business

Forecasts as of 22 October, 2013

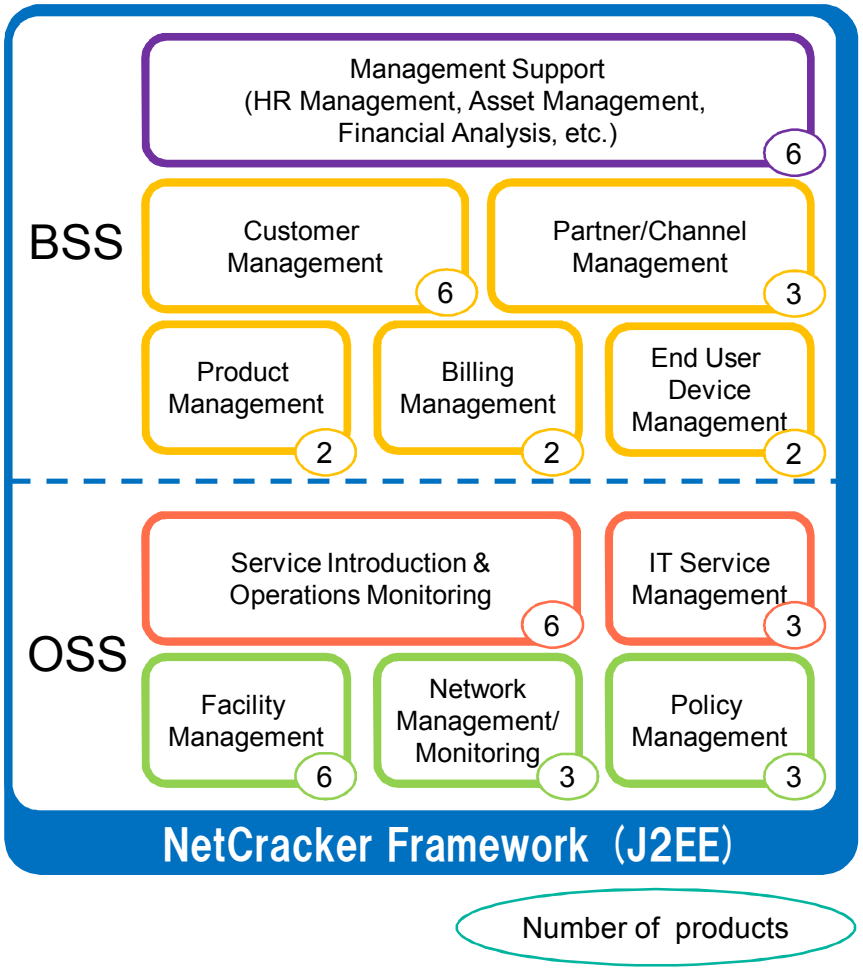
Promotion of Single, Common Platform

Enable integration and expansion of systems in less time and at a lower cost

- Realization of next-generation OSS/BSS through the OSS and BSS platforms
  - All 42 products from 11 product domains can be freely combined for provision to customers
- Support of SDN functions
  - Support of vEPC and virtual data center management functions

✓Expand platform through the incorporation of additional functions
✓Apply platform to the custom-base SI projects

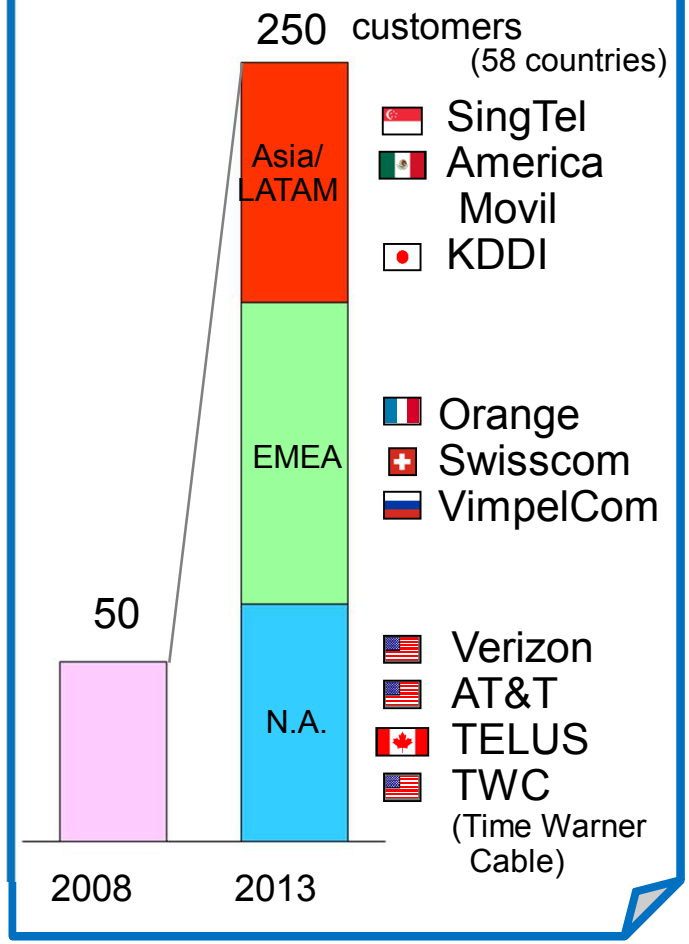
TOMS 9.0 (11 domains / 42 products)



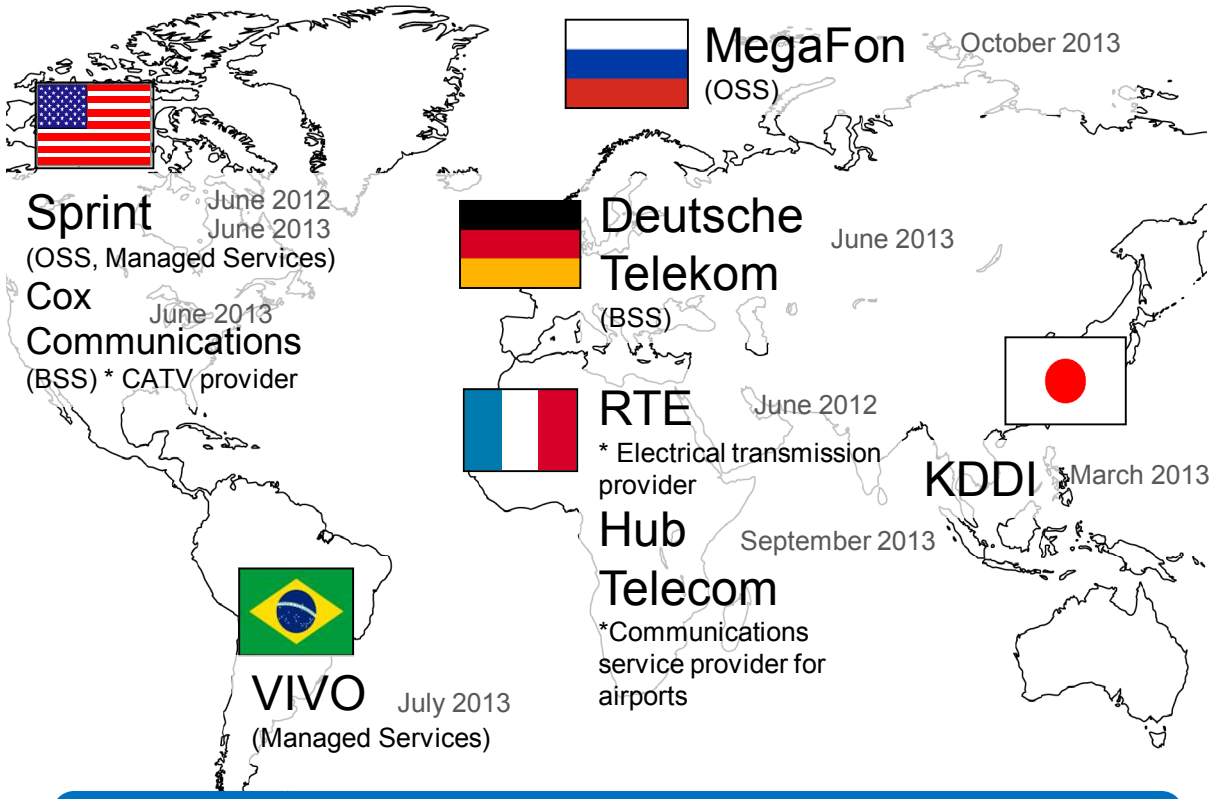
Expansion of New Customer Base

Acquire new customers through the strengthening of products and expansion of sales channels

NetCracker customers by region



Achievements after acquisition of Convergys' BSS business (since May 2012)



✓ Expand sales to a new customer base such as utility providers, as well as customers of NEC's international subsidiaries.

SDN

Positioning of Carrier SDN Solutions

NEC's SDN Solution Menu

Target market	Application fields	Solutions
NEC Enterprise SDN Solutions	Network optimization	- Optimization of base/data center connections - Optimization of office LANs
	Security	- Access authentication
	Mobile	–
NEC Data Center SDN Solutions	Operation / management	- Automation of IaaS operations
	Integration	- Integration of data center networks
NEC Telecom Carrier SDN Solutions	Network management	- Integrated operations/management
	Network infrastructures	- Virtualisation of network functions - Transport

*Activities Targeting SDN (July 10, 2013)

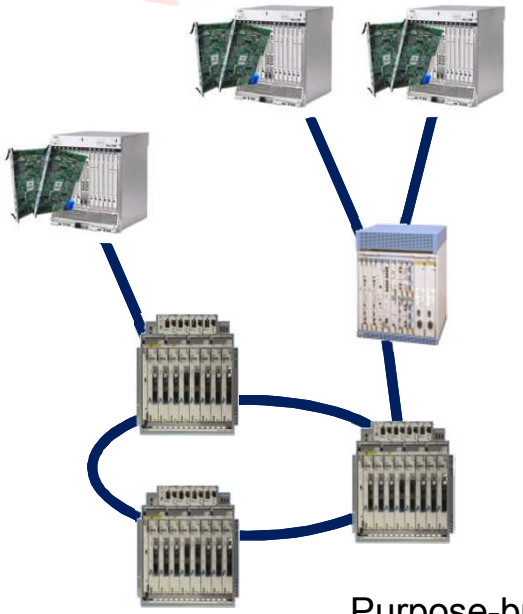
Carrier SDN Overview

NEC transforms traditional carrier networks into simple and flexible SDN

Traditional Networks

Complex, inflexible

✓Distributed control functions
✓Comprised of diverse purpose-built devices
✓Individual settings for each device



Purpose-built equipment

SDN

Simple, flexible

✓Centralized control
✓Comprised of general-purpose hardware + virtual resources
✓Automated settings

- Efficient use of resources
- Rapid provision of services
- Improved resiliency

Control software
(Software on servers)

Centralized control

- Data forwarding hardware
(Switches and other communication devices)

Centralized control

Network Functions software
(Software on servers)

+

General-purpose servers / Virtualisation

NFV

Value provided by Carrier SDN

Carrier SDN enables diversification of services on common network by utilizing virtualisation technology

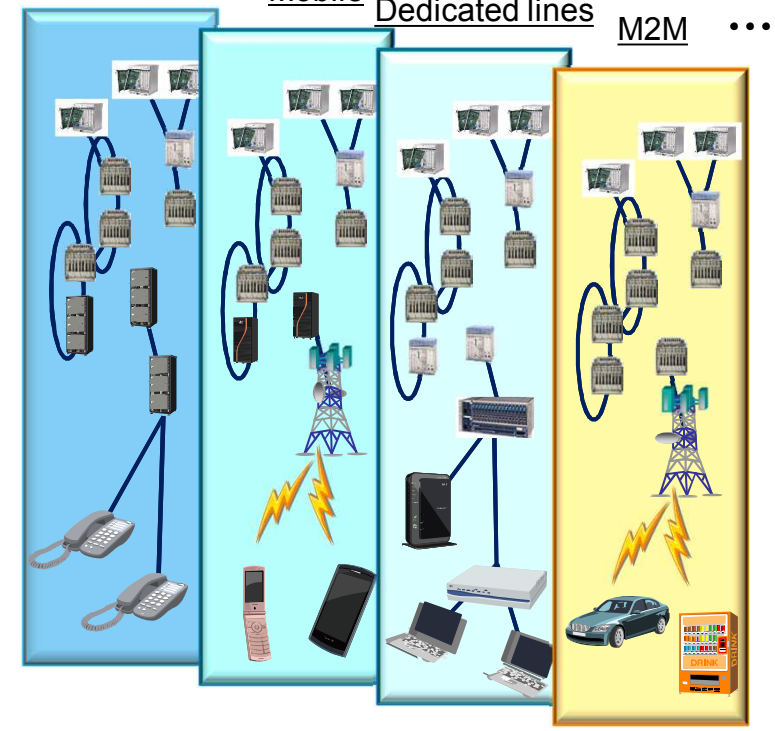
Voice, Internet → FMC, Big Data → Diversification of Services

Specialized networks built and operated for each service

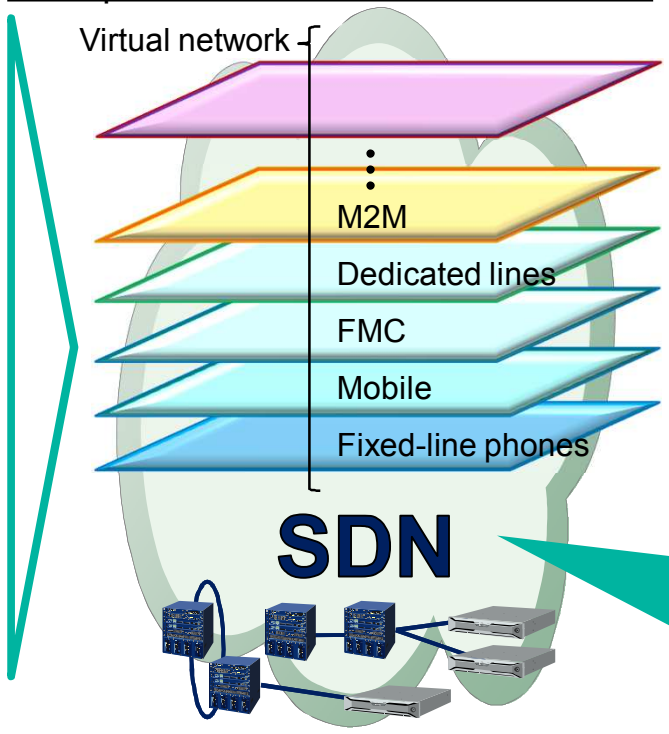
Networks become more complicated with increase in services

Breakthrough

Services provided flexibly through simple common networks



Example of virtual network construction



Value provided by carrier SDN

Carriers

- Reduced TCO
- Flexibility and scalability
- High availability, high reliability
- New sources of revenue

Service Providers

- Secure
- On-demand
- Equality of services

End Users

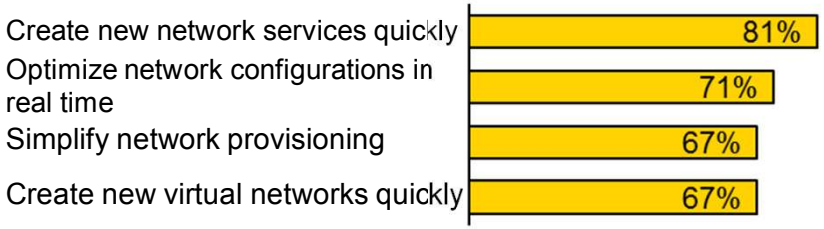
- Safety
- QoE
- Reduced fees

Expansion of Carrier SDN Initiatives

- Telecom carriers are keenly interested in introducing Carrier SDN to meet specific existing needs
- Numerous projects aimed at shifting carrier networks to SDN are under way around the world

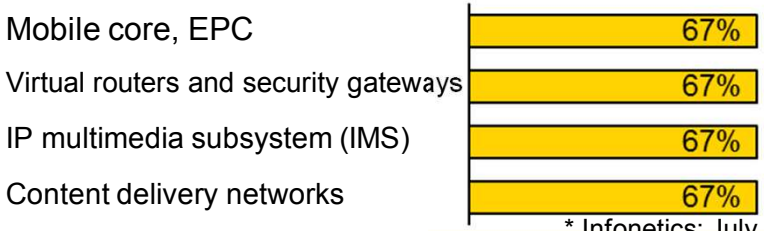
Results from Survey on Carrier SDN Needs

SDN Deployment Drivers



SDN and NFV Target Domains

Targeted NFV Use Cases



* Infonetics; July 2013

Joint SDN R&D Projects

Open Networking Research Center

Stanford University, UC Berkeley, 12 companies
(Established in April 2012)

- Joint development of SDN technologies supporting carriers and providers

ETSI-Network Functions Virtualisation

13 telecom carriers (launched in October 2012)

- Promotion of the virtualisation of network functions utilizing general-purpose servers

Ministry of Internal Affairs and Communications: Research and development of network virtualisation technologies

2 telecom carriers, 3 companies (announced in September 2013)

- Application of SDN to wide-area network infrastructure

Ministry of Internal Affairs and Communications: Field trials of technology for reducing congestion of communications

2 universities, 1 telecom carrier, 3 companies
(announced in October 2013)

- Utilization of SDN for large-scale disaster countermeasures

NEC's Strengths in the SDN Market

NEC's Strengths

- Released the first commercial products using OpenFlow technologies
- Establish SDN solution for telecom carriers ahead of competitors
- Incorporate carrier grade technologies cultivated by NEC
- Participate in and contribute to SDN R&D/standardization communities from initial stages
  (Clean Slate, ETSI NFV-ISG, ONRC, ONF)

Recognized by carriers as one of the global leaders in SDN

SDN Products and Commercial Applications

Released May 29, 2013
One of the first to achieve OpenFlow based SDN on a commercial cloud platform
Automated operations
(WebSAM vDC Automation, UNIVERGE PF6800)

Released June 10, 2013
Release of products accommodating latest OpenFlow 1.3 specs
(UNIVERGE PF Series)

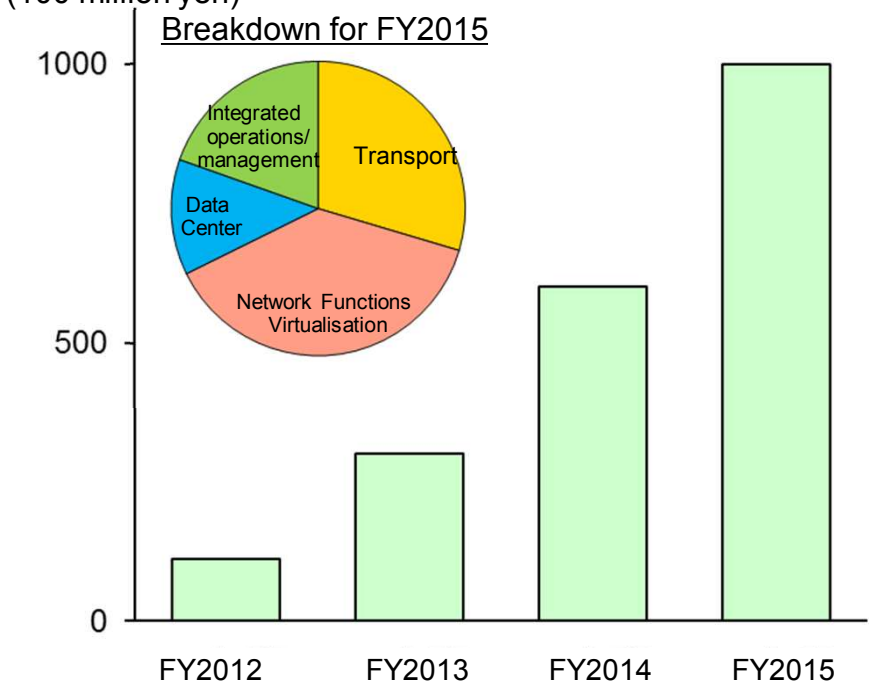
Released October 2013
World's first to obtain ONF certification
(UNIVERGE PF5240/5248)

Implemented / verified by more than 100 companies, including carriers
(Shipped more than 2,000 switches)

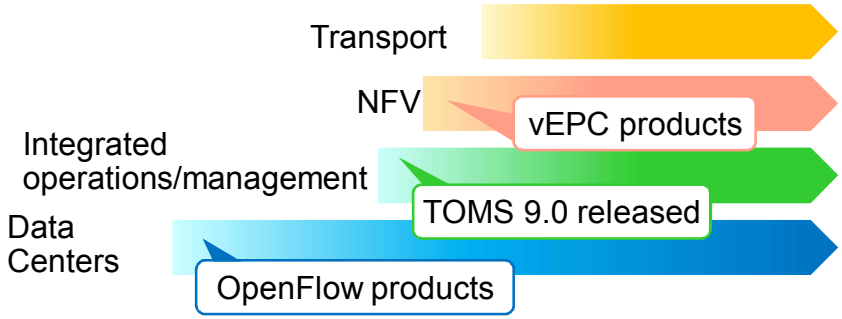
SDN Business Strategies

Sales Plan

(100 million yen)



Solution Roadmap



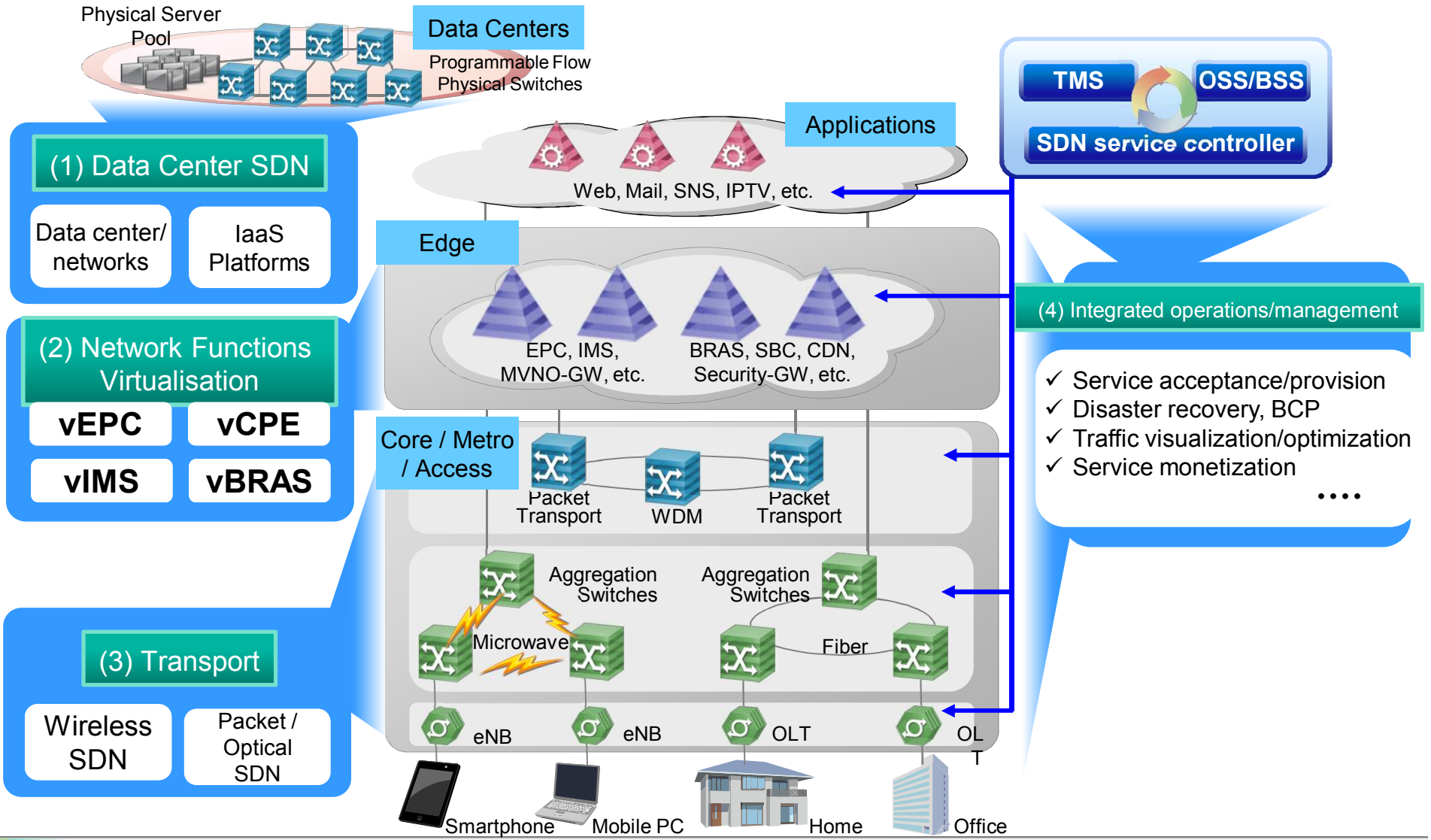
Business Strategies

- Establish carrier SDN solutions
  - Differentiation by carrier grade technologies, virtual tenant network technologies, OSS/BSS linkage
- Focus on leading global carrier market
  - Joint solution development
  - Expansion to emerging countries
- Enhance marketing solution delivery capabilities
  - Established new SDN technology/marketing center in Europe
  - Utilize NetCracker solution delivery capabilities / solution selling capabilities
  - Diversification of business model

Forecasts as of 22 October, 2013

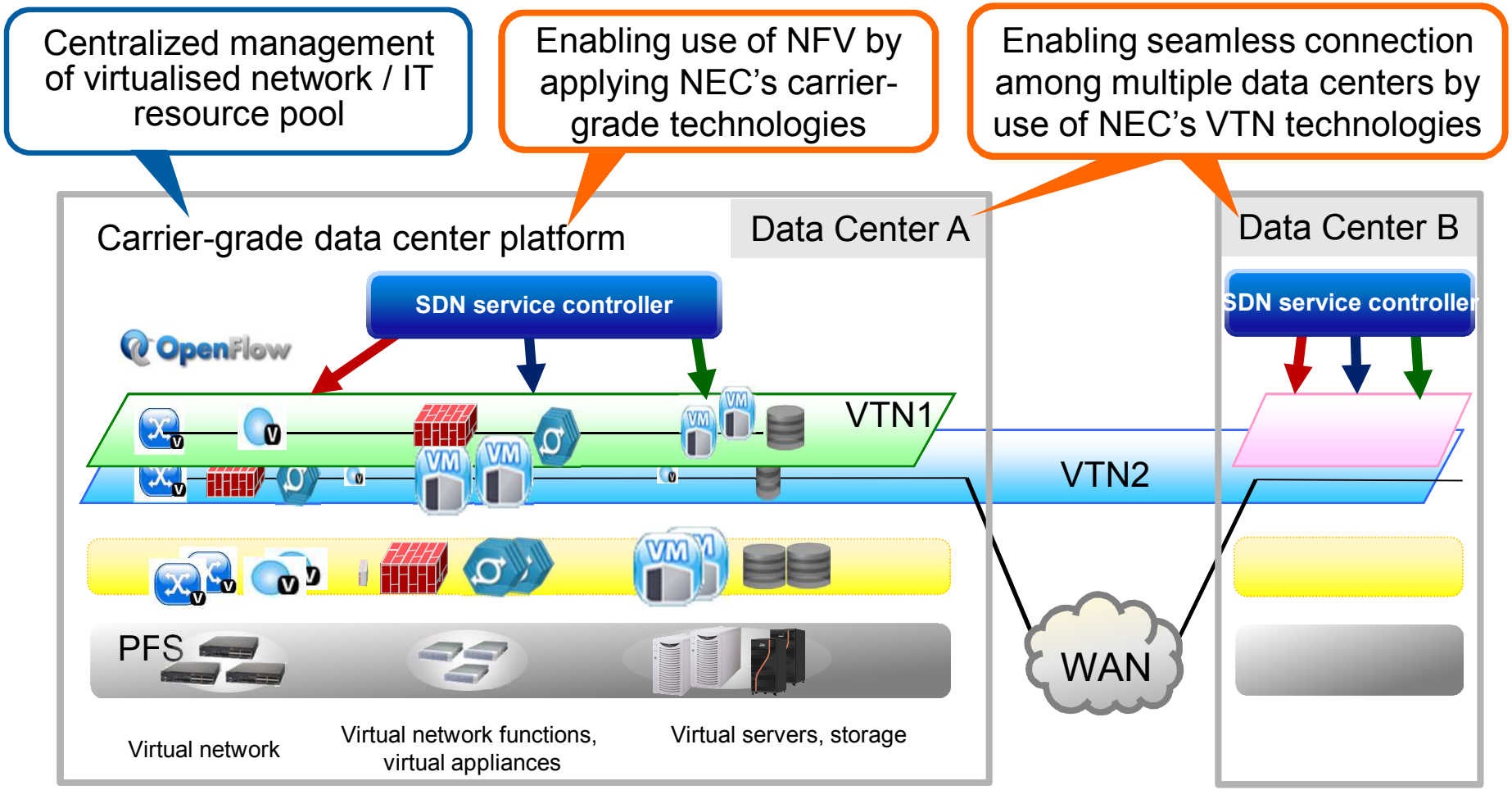
NEC's Carrier SDN Solutions

Providing wide-ranging solutions for carriers' needs



Data Center SDN Solutions

- Dramatically reduce time and expenses required to change ICT resources by centralized control and automated settings
- Provide services flexibly in the scale required to meet data-center user needs



Network Functions Virtualisation Solutions

- Use common general-purpose servers instead of purpose-built equipment for each function, to enable easy maintenance and upgrades
- Flexibly allocate multiple network function resources based on traffic demand

Announced
Oct. 22, 2013

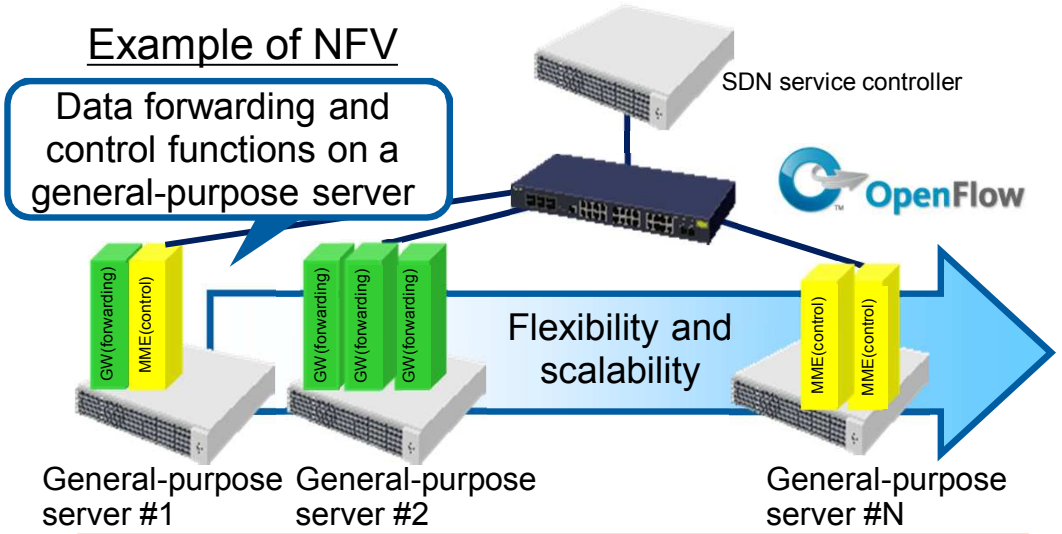
World's first commercial vEPC

- High scalability
- Carrier grade performance
  Same performance as purpose-built equipment
- Uses general-purpose servers
  TCO reduced by 30-40%

Myanmar communications infrastructure is scheduled to go into operation in December 2013

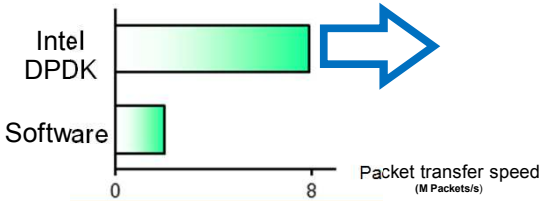
Example of NFV

Data forwarding and control functions on a general-purpose server



(1) High data processing performance

Apply NEC's original technologies with Intel's DPDK to achieve high performance



(2) High reliability

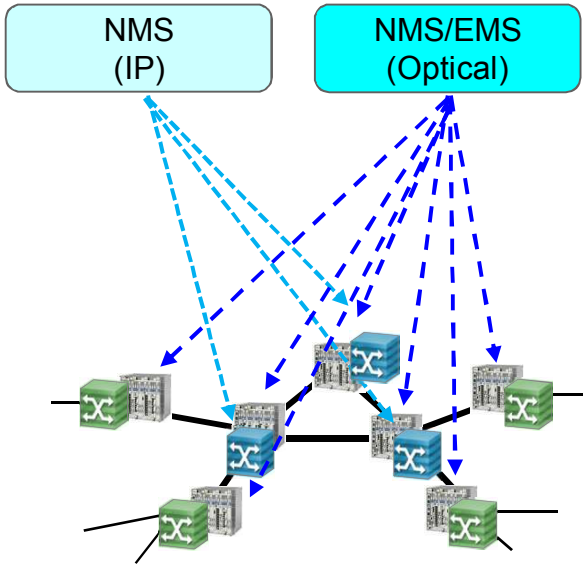
Enable high speed fault detection and switch over in virtualisation environment by Carrier grade hypervisor

Transport Solutions

- Guarantee end-to-end network quality by centralized control
- Provide various services easily and economically by use of network virtualisation

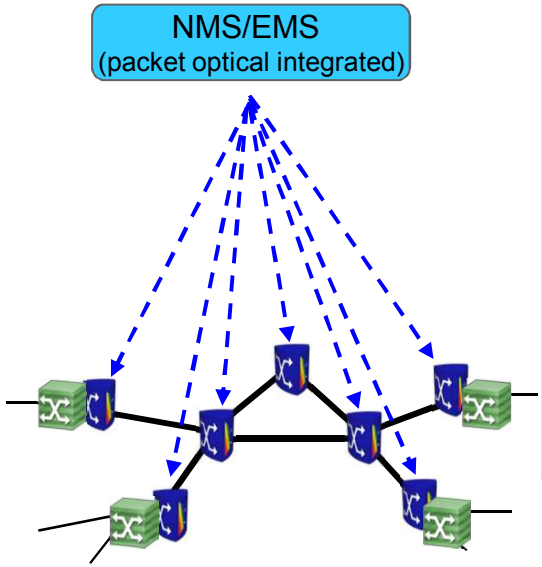
Traditional Networks

IP and optical networks comprised of purpose-built devices
➔Adding new services requires individual settings



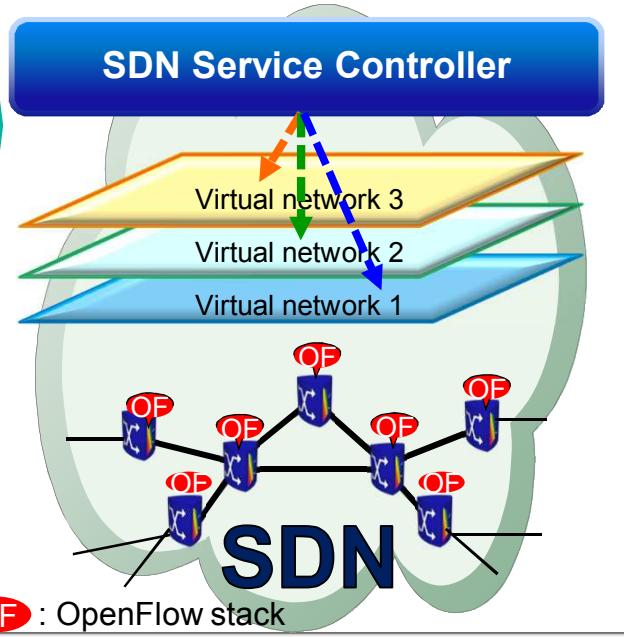
Converged Packet Optical Transport

Simplify networks by converging devices and management of core networks
➔Reduce number of devices requiring settings



Packet / Optical SDN

Virtualise and integrate IP and optical networks
➔Virtual networks for each service can be added easily on common networks



OF : OpenFlow stack

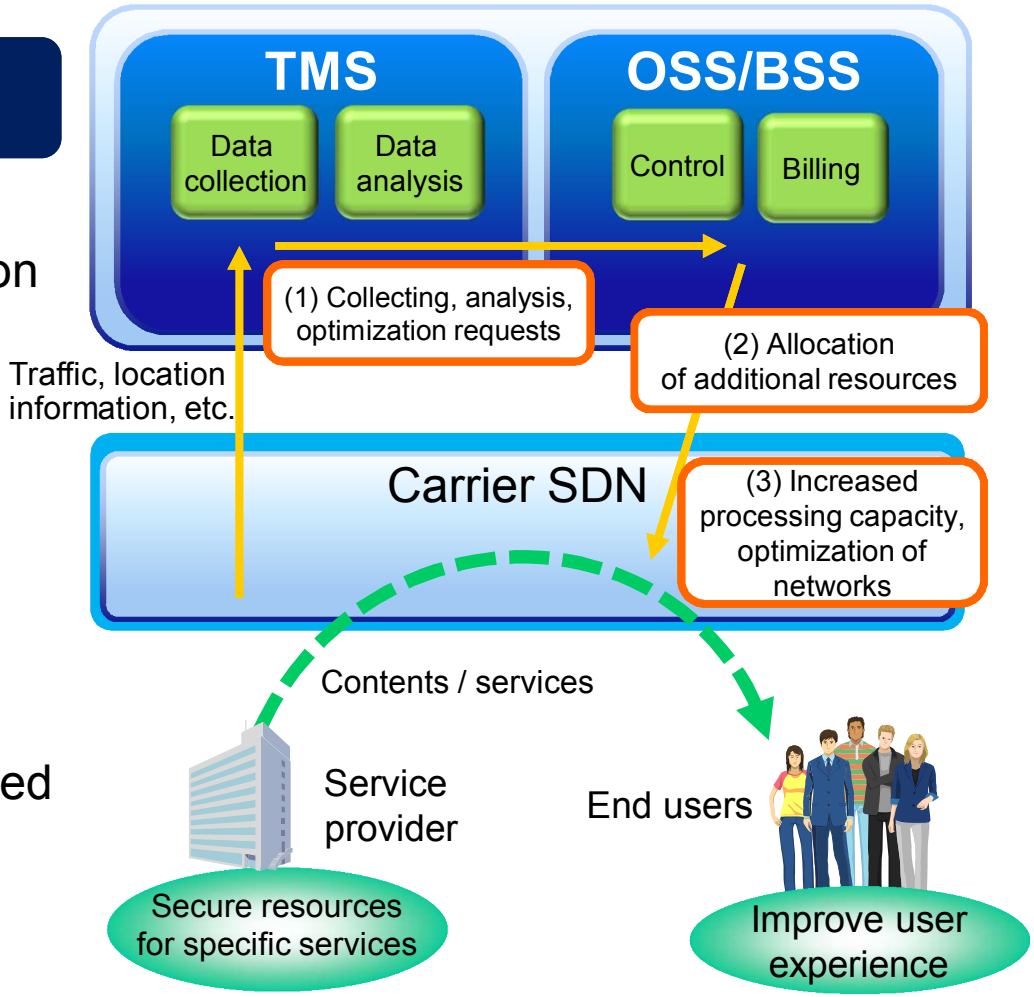
Integrated Operation/Management Solutions

- Improve user experience and offer monetization opportunities by guaranteeing bandwidth for specific contents and services

E.g.: Prioritized bandwidth for specific contents / services

- Collect / analyze traffic information
  (1) Collect and analyze information on traffic from terminals to networks using TMS

- Specify allocation of additional resources
  (2) Visualize traffic conditions using OSS/BSS, and allocate additional resources to maintain QoE
  (3) Guarantee bandwidth for prioritized contents and services

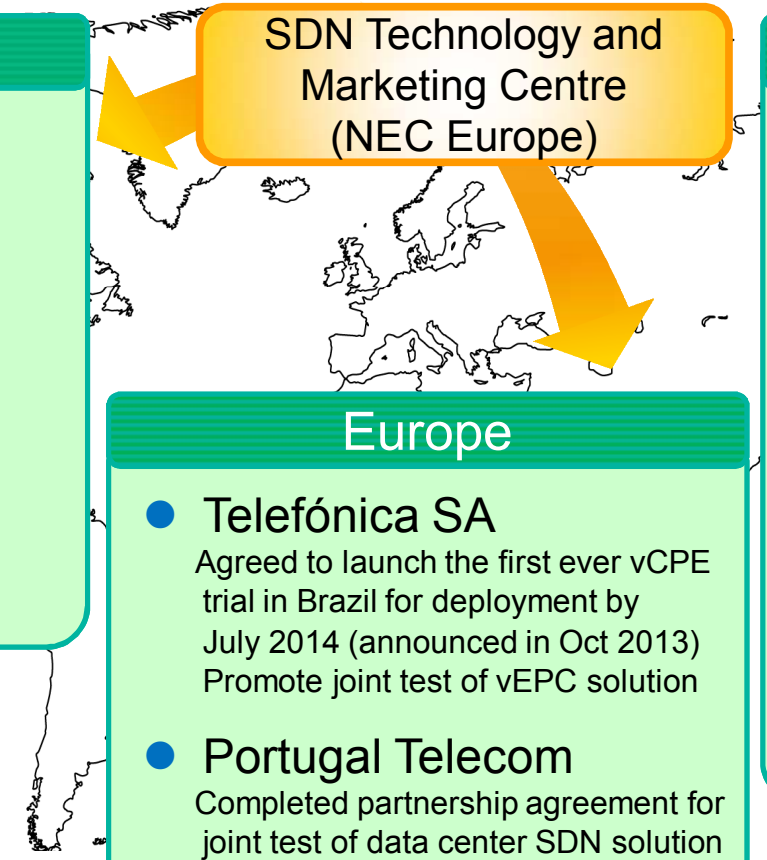


Promoting Commercialization of SDN with Global Carriers

- Promote commercialization with leading global carriers (more than 10 companies)
- Establish Technology and Marketing Centre in Europe, and strengthen collaboration with carriers, standardization organizations, research agencies

North America

- **Company A**
  Joint trials of vEPC solution (applied in LTE service for enterprises)
- **Company B**
  Studying joint trials of vEPC solution for building M2M networks
- **Company C**
  Joint study targeting trials of vEPC solution



Europe

- **Telefónica SA**
  Agreed to launch the first ever vCPE trial in Brazil for deployment by July 2014 (announced in Oct 2013)
  Promote joint test of vEPC solution
- **Portugal Telecom**
  Completed partnership agreement for joint test of data center SDN solution

APAC

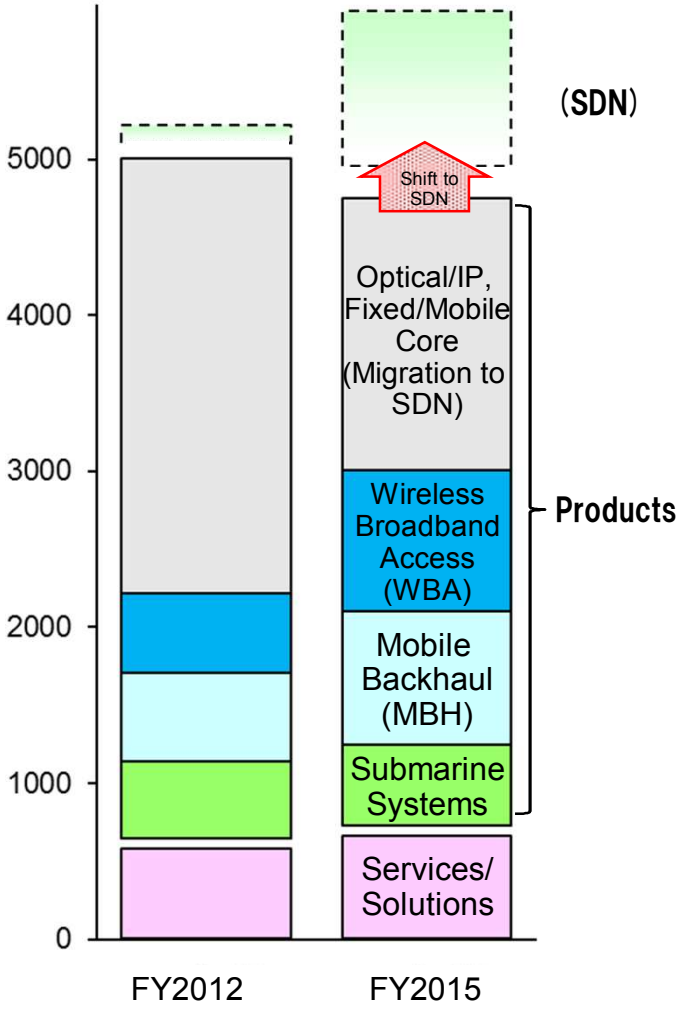
- **NTT Communications**
  Adopted ProgrammableFlow as part of Biz Hosting Enterprise Cloud (announced in July 2012)
- **Myanmar Posts and Telecommunications**
  Deploy vEPC solution as part of commercial LTE system (scheduled to go into operation in December 2013)
- **Company D**
  Completed joint trials of data center SDN solutions; currently proposing commercial data centers

Products, Services / Solutions

Products, Services / Solutions

(100 million yen)

Sales Plan



Core products/solutions in each field

WBA	● LTE-A (C-RAN) ● Small cell solutions (E-RAN, LTE-Femto) ● BWA/FWA, Public safety Selected by NTT DoCoMo as a LTE-A development vendor
MBH	● All outdoor radio ● High power ODU Global Top 3
Submarine	● 100G optical submarine cable repeaters, line termination equipment, thin cables ● Submarine earthquake/tsunami observation systems Global Top 3
Services/ Solutions	● Smart phone services, M2M ● Service platforms

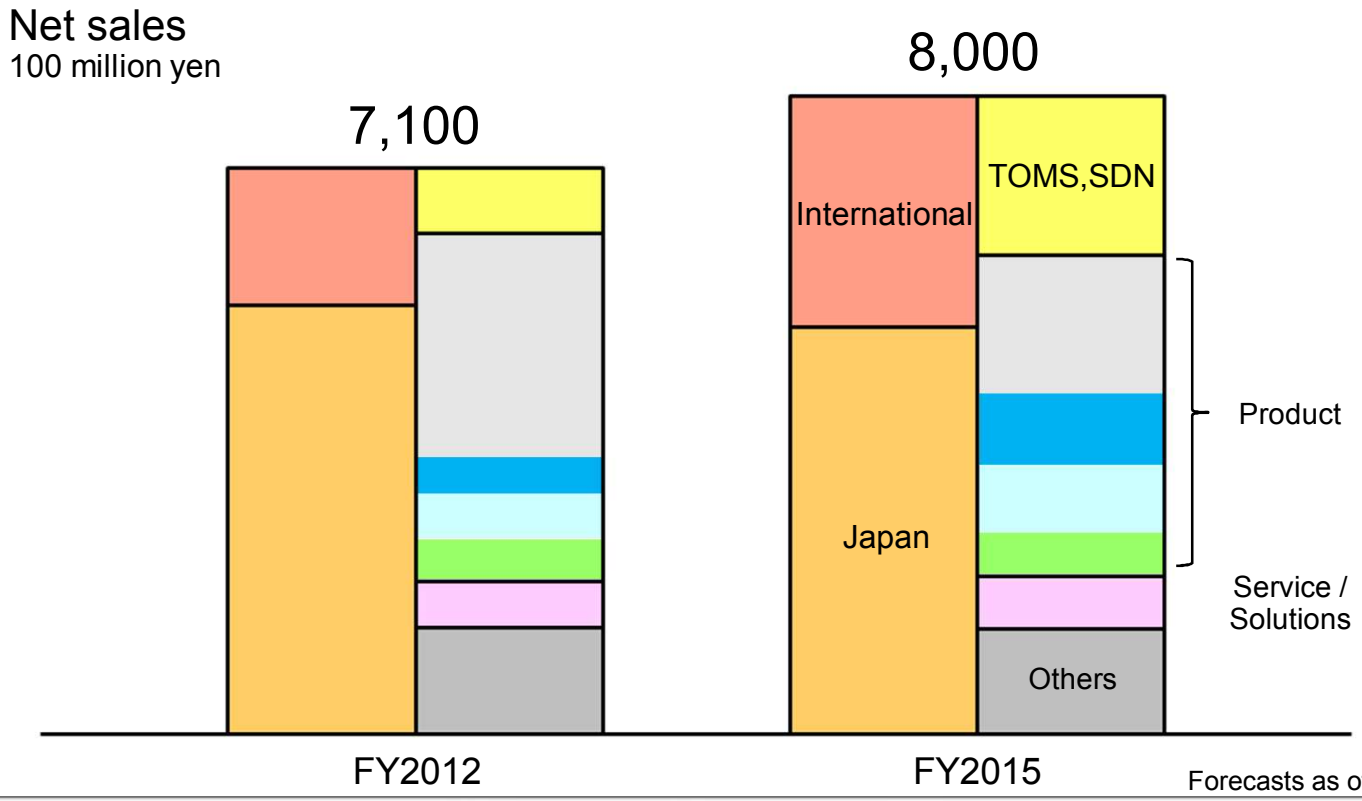
Forecasts as of 22 October, 2013

Contents

Business Target

Achieve net sales of 800 billion yen (operating profit ratio of 10%) in FY2015

	FY2012	FY2015
International sales ratio	24%	36%
TOMS, SDN ratio	12%	25%
Operating profit ratio	10%	10%



Forecasts as of 22 October, 2013

Acronyms

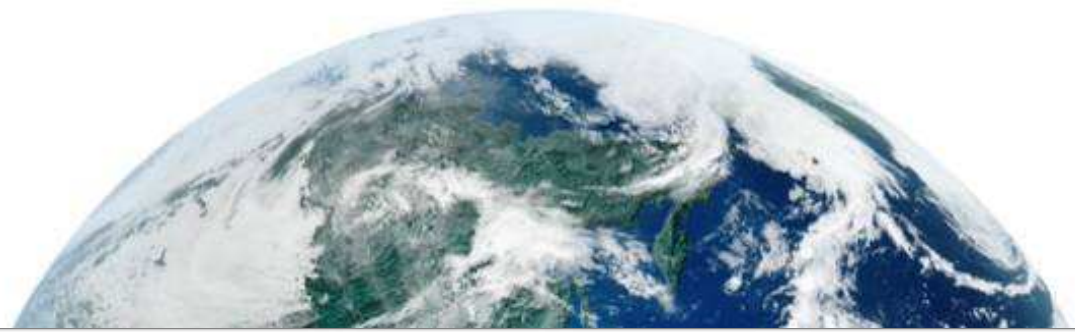
ADSL: Asymmetric Digital Subscriber Line
BCP: Business Continuity Planning
BSS: Business Support System
BWA: Broadband Wireless Access
C-RAN: Centralized Radio Access Network
DPDK: Data Plane Development Kit
EMS: Equipment Management System
eNB: eNodeB
EPC: Evolved Packet Core
ETSI: European Telecommunications Standards Institute
E-RAN: Enterprise Radio Access Network
FMC: Fixed Mobile Convergence
FTTH: Fiber to the Home
FWA: Fixed Wireless Access
GW: Gateway
IaaS: Infrastructure as a Service
IMS: IP Multimedia Subsystem
IPSec: Internet Protocol Security
J2EE: Java2 Enterprise Edition
LTE: Long Term Evolution
LTE-A: Long Term Evolution Advanced
M2M: Machine to Machine
MBH: Mobile Backhaul
MME: Mobility Management Entity
NFV: Network Functions Virtualisation
NMS: Network Management System
ODU: Outdoor Unit
OLT: Optical Line Termination
OMCS: Open Mission Critical System
ONF: Open Networking Foundation
ONRC: Open Networking Research Center
OSS: Operation Support System
OTT: Over the Top
PFS: Programmable Flow Switch
QoE: Quality of Experience
SDN: Software-Defined Networking
TMS: Traffic Management Solution
TOMS: Telecom Operations and Management Solutions
vBRAS: Virtualised Broadband Remote Access Server
vCPE: Virtualised Customer Premises Equipment
vEPC: Virtualised Evolved Packet Core
vIMS: Virtualised IP Multimedia Subsystem
VM: Virtual Machine
VTN: Virtual Tenant Network
WAN: Wide Area Network
WBA: Wireless Broadband Access
WDM: Wavelength Division Multiplexing

NEC Group Vision 2017

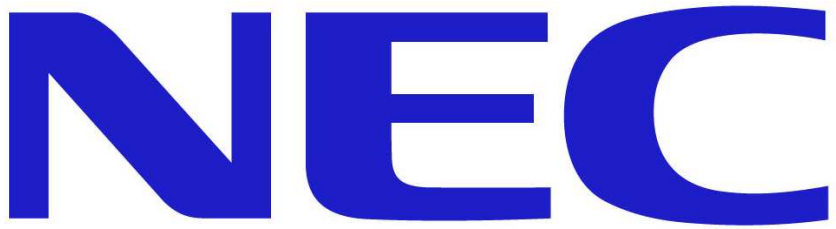
To be a leading global company leveraging the power of innovation to realize an information society friendly to humans and the earth

NEC Group Vision 2017

To be a leading global company
leveraging the power of innovation
to realize an information society
friendly to humans and the earth



Empowered by Innovation



CAUTIONARY STATEMENTS:

This material contains forward-looking statements pertaining to strategies, financial targets, technology, products and services, and business performance of NEC Corporation and its consolidated subsidiaries (collectively "NEC"). Written forward-looking statements may appear in other documents that NEC files with stock exchanges or regulatory authorities, such as the Director of the Kanto Finance Bureau, and in reports to shareholders and other communications. NEC is relying on certain safe-harbors for forward-looking statements in making these disclosures. Some of the forward-looking statements can be identified by the use of forward-looking words such as "believes," "expects," "may," "will," "should," "seeks," "intends," "plans," "estimates," "targets," "aims," or "anticipates," or the negative of those words, or other comparable words or phrases. You can also identify forward-looking statements by discussions of strategy, beliefs, plans, targets, or intentions. Forward-looking statements necessarily depend on currently available assumptions, data, or methods that may be incorrect or imprecise and NEC may not be able to realize the results expected by them. You should not place undue reliance on forward-looking statements, which reflect NEC's analysis and expectations only. Forward-looking statements are not guarantees of future performance and involve inherent risks and uncertainties. A number of important factors could cause actual results to differ materially from those in the forward-looking statements. Among the factors that could cause actual results to differ materially from such statements include (i) global economic conditions and general economic conditions in NEC's markets, (ii) fluctuating demand for, and competitive pricing pressure on, NEC's products and services, (iii) NEC's ability to continue to win acceptance of NEC's products and services in highly competitive markets, (iv) NEC's ability to expand into foreign markets, such as China, (v) regulatory change and uncertainty and potential legal liability relating to NEC's business and operations, (vi) NEC's ability to restructure, or otherwise adjust, its operations to reflect changing market conditions, (vii) movement of currency exchange rates, particularly the rate between the yen and the U.S. dollar, (viii) the impact of unfavorable conditions or developments, including share price declines, in the equity markets which may result in losses from devaluation of listed securities held by NEC, and (iv) impact of any regulatory action or legal proceeding against NEC. Any forward-looking statements speak only as of the date on which they are made. New risks and uncertainties come up from time to time, and it is impossible for NEC to predict these events or how they may affect NEC. NEC does not undertake any obligation to update or revise any of the forward-looking statements, whether as a result of new information, future events, or otherwise.

The management targets included in this material are not projections, and do not represent management's current estimates of future performance. Rather, they represent targets that management will strive to achieve through the successful implementation of NEC's business strategies.

Finally, NEC cautions you that the statements made in this material are not an offer of securities for sale. Securities may not be offered or sold in any jurisdiction in which required registration is absent or an exemption from registration under the applicable securities laws is not granted.