



Overview of “**ooo**(O three)” Open Innovation over Network Platform

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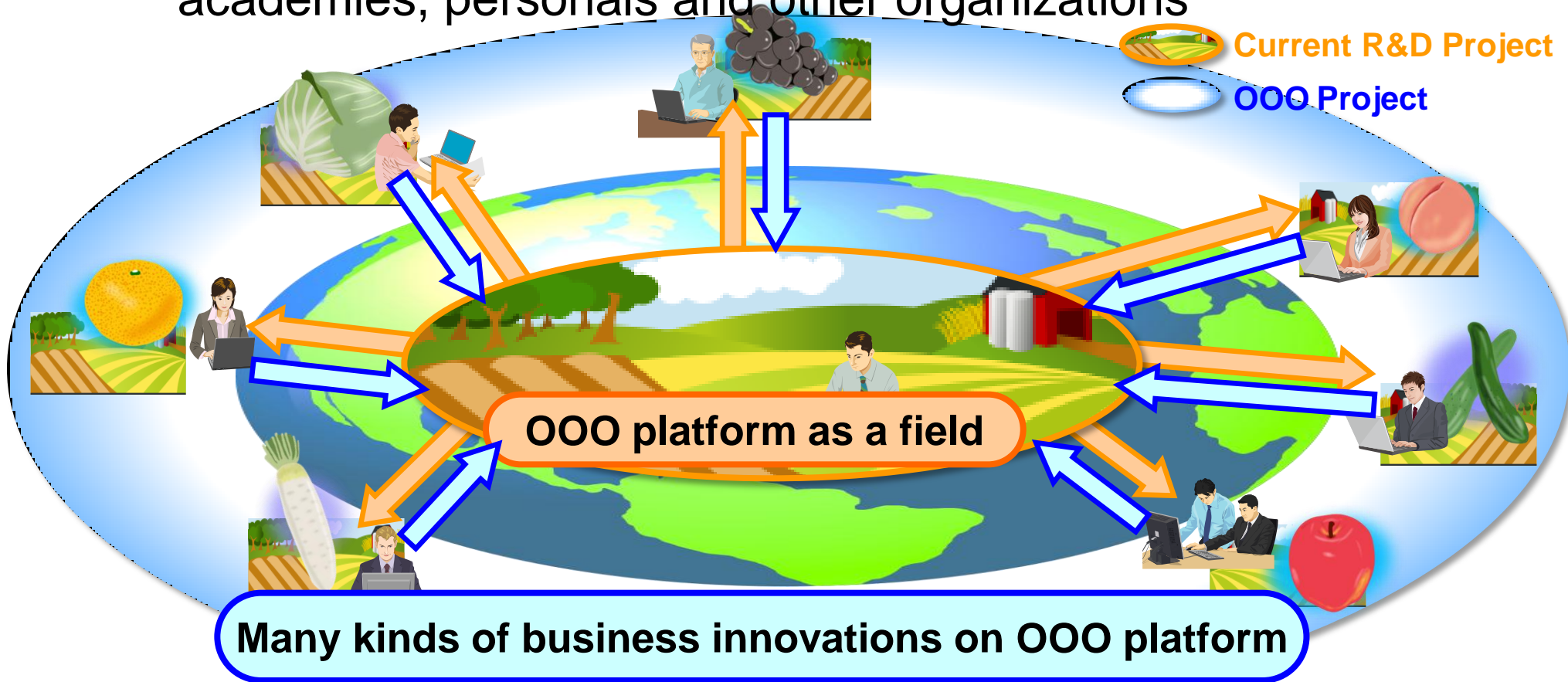
- Introduction of OOO
- Motivation and Mission
- Overview of technologies by OOO
- Project Organization (initiated)
- Future vision of OOO

- Project name : **OOO** (O three)
 - **OOO** stands for Open, Organic and Optima
 - **OOO** also shows
‘**Ozone=O₃**’ : element exists over the ‘cloud’.
and
 - **Open** to any community (user, developer, industry, academia...and also other OSS communities)
 - **Organic** policy (non-chemical, non-political)
 - **Optima** : Optimal solutions for networking (Scale, Performance, Quality, Security and Off the Shelf)

OOO provides a platform like a productive field

pen organic ptima

- Users* can cultivate many kinds of services and applications like fruits, vegetables, and cereals using OOO platform.
- Users can also contribute their innovations to OOO platform.
 - *users : service providers, venders, governments, academies, personals and other organizations





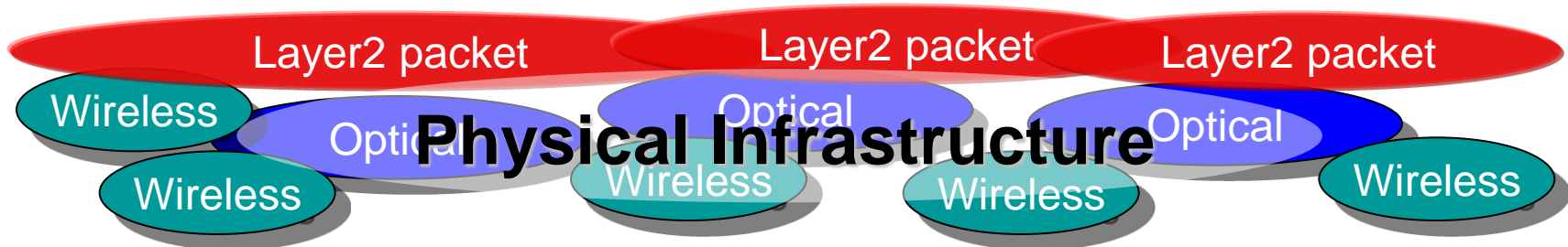
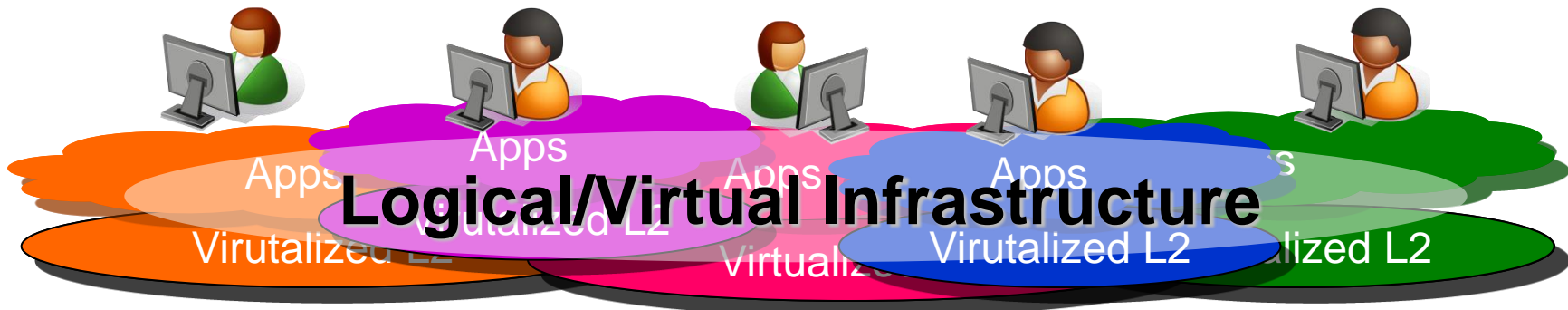
Motivation and Mission

- **Increasing variation of services and its models and decreasing lifecycle time of services**
 - Various services using cloud computing and mobile phone (smart phone and tablet) using ‘Apps’ (not webs)
 - Service provider can easily start up and close their service.
 - User can try and stop to use various services by installing/un-installing Apps
 - Long-tail services providers requires rapid starting up and rapid closing (withdrawing) for their infrastructures
- **New requirements for usage of wide area network**
 - Rapid opening and closing global offices or sites (Real-time offices and infrastructure)
 - Acceleration of collaboration between various different industry (clouds) by the big data business expansion

Motivations



- **Rapid design and configuration of multi-layer network**
 - Optical network, Wireless network, OpenFlow network, and Other legacy packet networks
- **Highly inter-operability between different network domains**
 - Between support protocols, qualities and securities
- **Enabling application service provider to handle virtualized network infrastructure provided by network provider**
 - VNO/MVNO, contents provider, broadcasting center etc.



For rapid and simple network deployment and withdraw

OOO realizes

- (1) Integrated operation and management of multi-layer network
- (2) Rapid physical network status reflection to VN OAM
- (3) Rapid VN status reflection to physical network

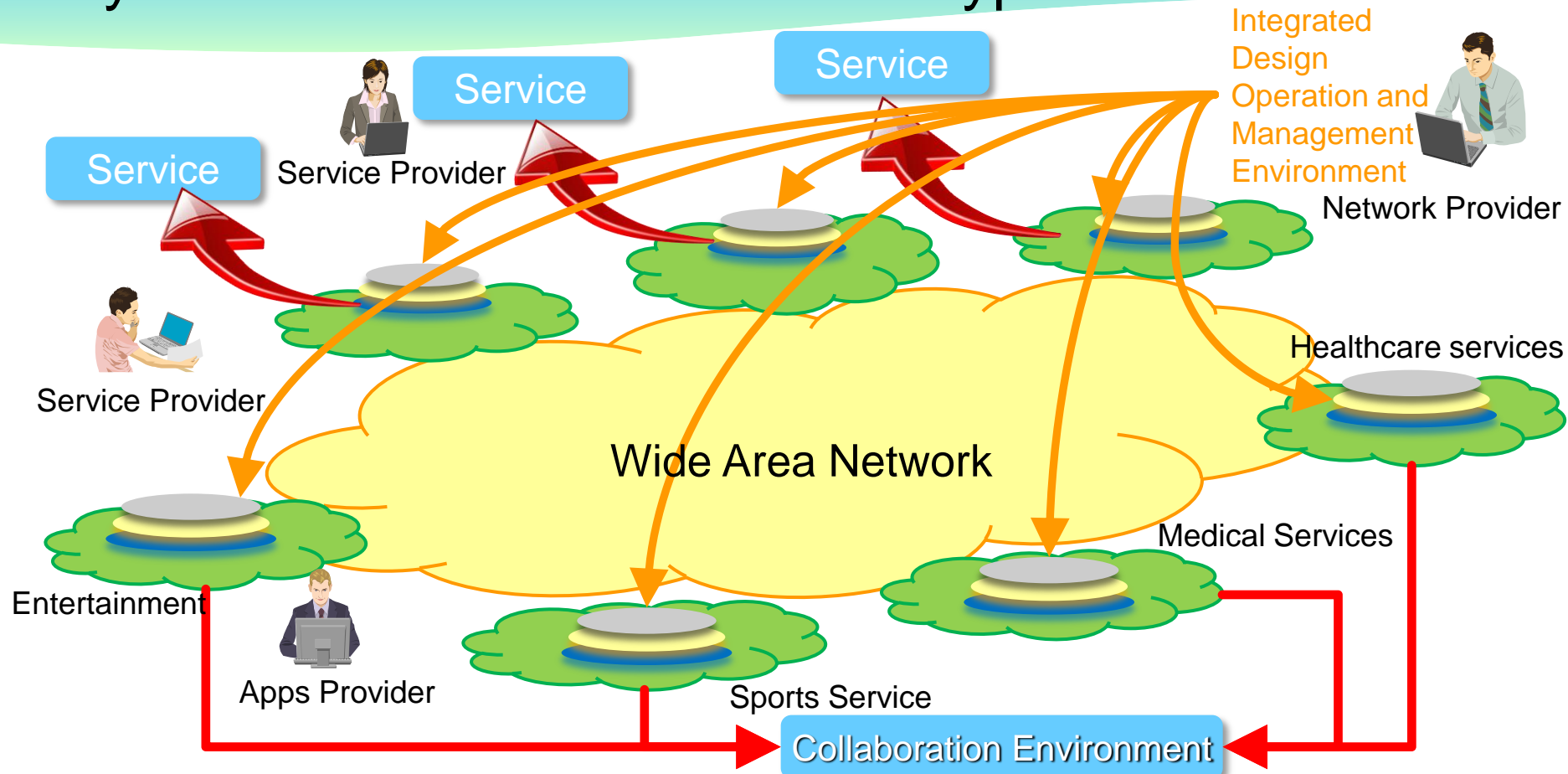
by providing

- (1) Network operating platform software
- (2) Virtualized network design, deployment and operation software
- (3) Network equipment optimized for network virtualization

OOO realizes Apps oriented network infrastructure

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- Rapid offering fully customized VN to Apps providers
- Easy federation between different type VNs



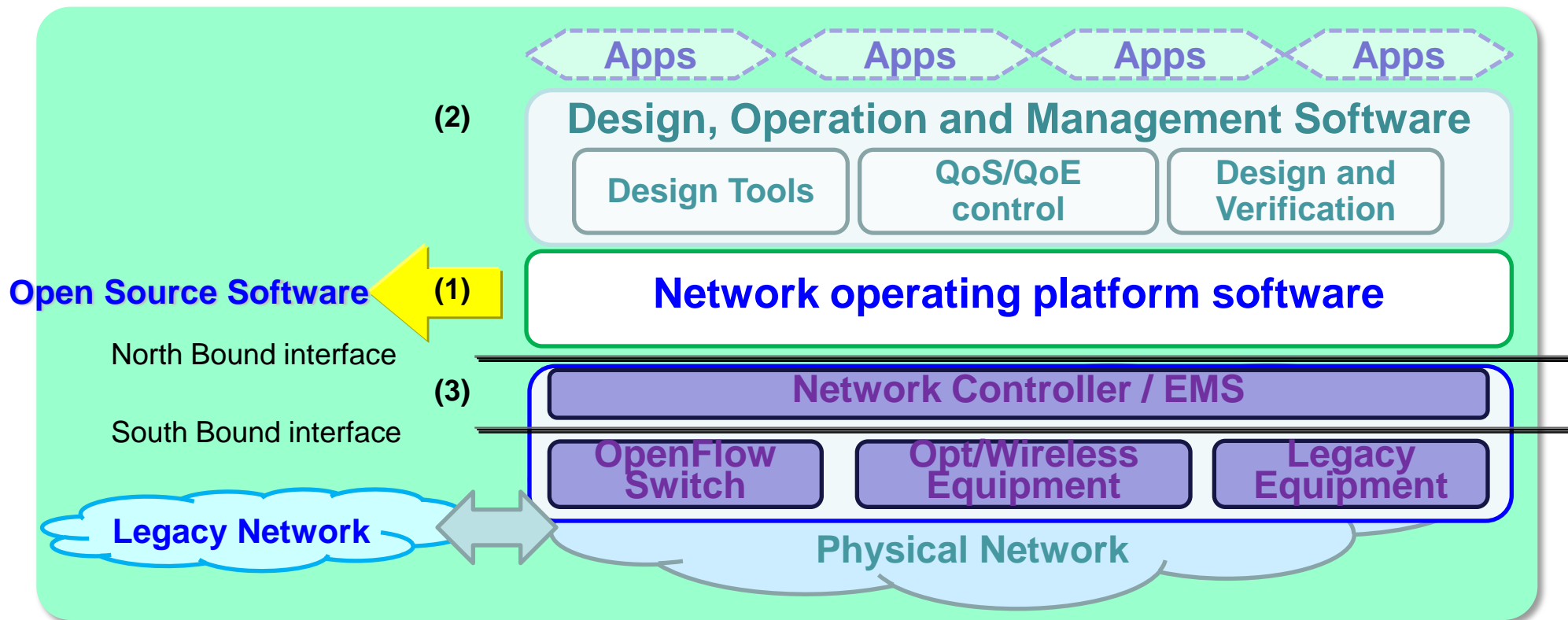
Innovation for brand new services using network effectively



Overview of the technology by OOO

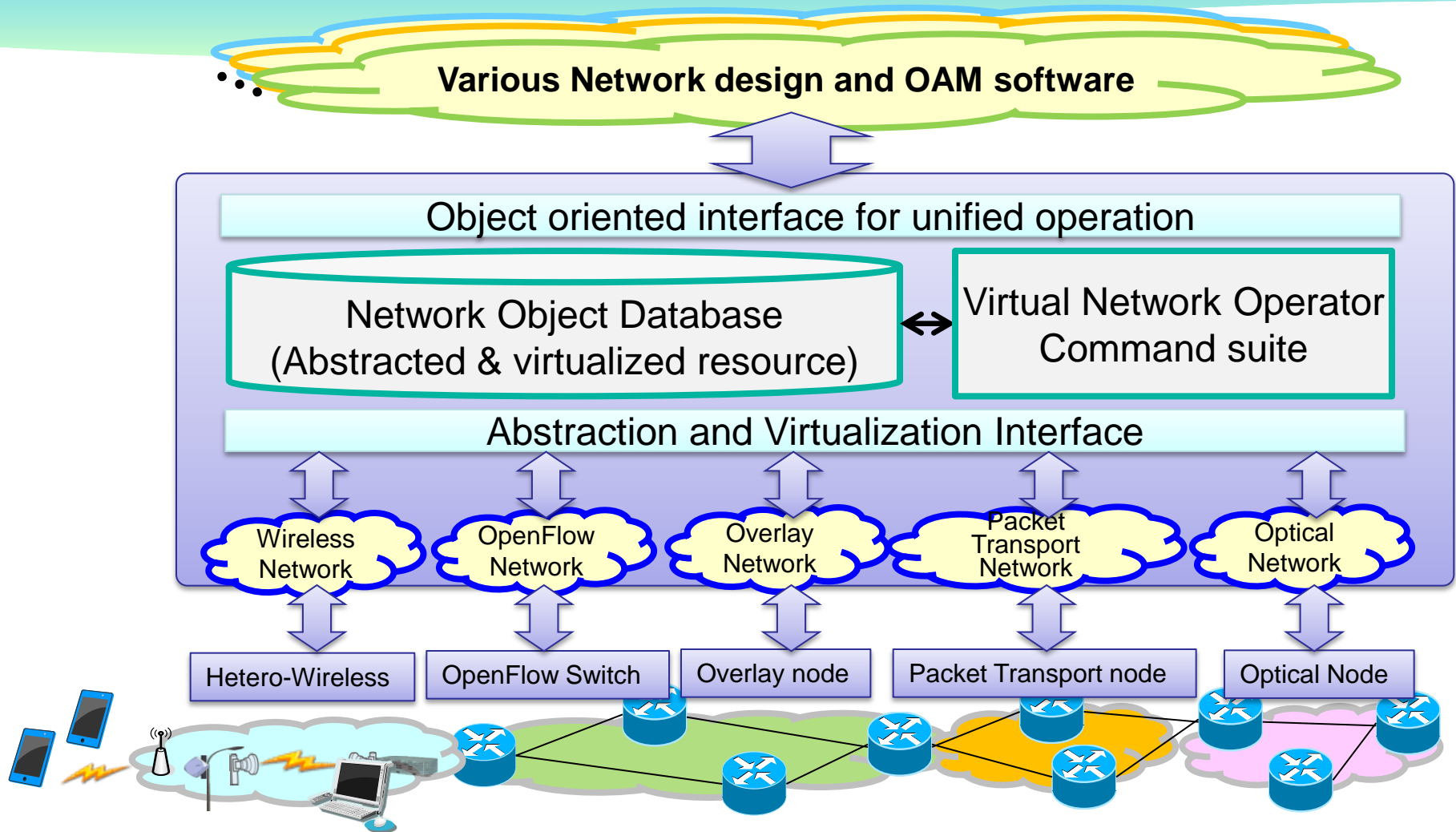
Object Oriented Virtual Network Operating Platform

- (1) Network operating platform software
- (2) Virtualized network design, deployment and operation software
- (3) Network equipment and controller optimized for network virtualization



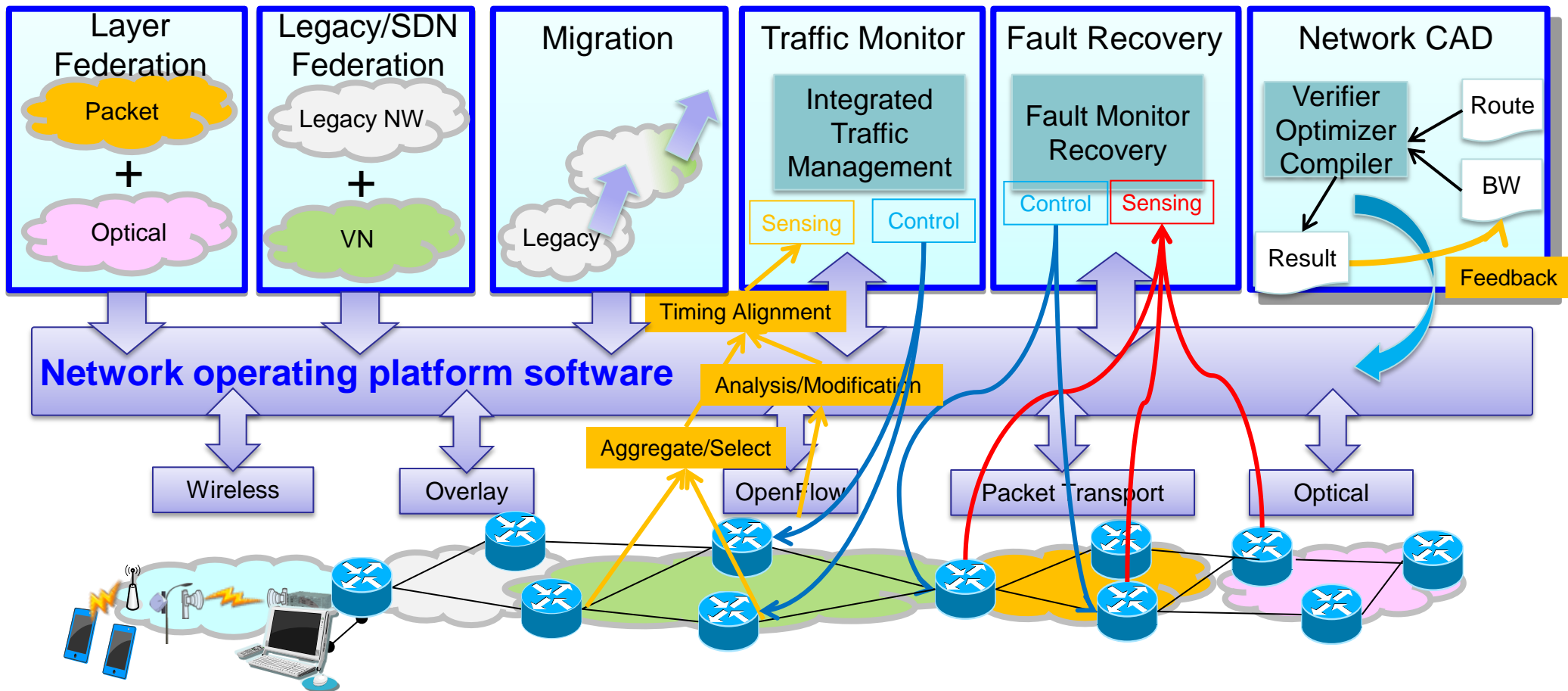
(1) Overview of Network operating platform software

- Manipulating virtual network using the network object database abstracts physical network resource and network operators



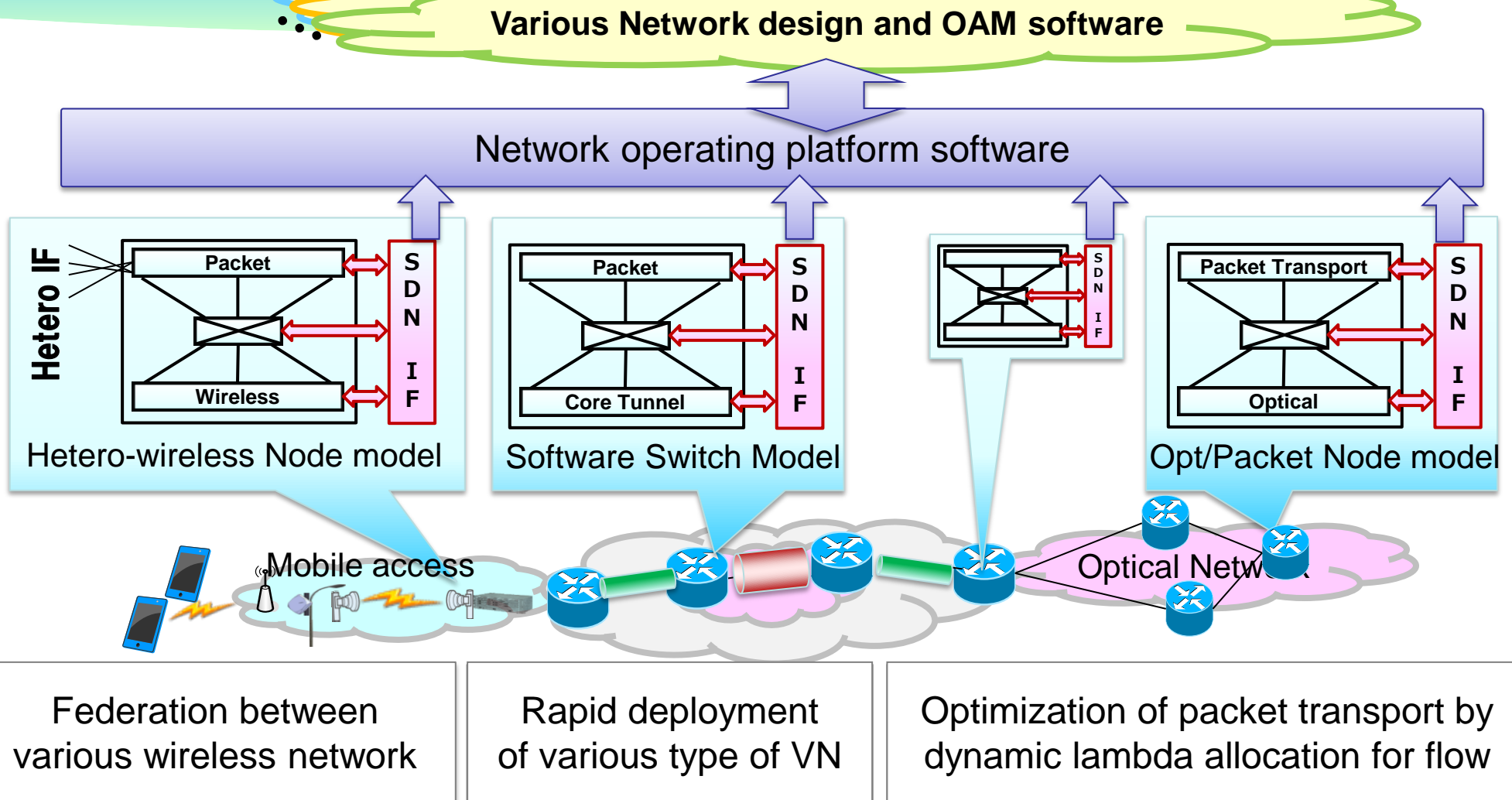
(2) Virtualized network design, deployment and operation software

- Enables virtual network dynamic construction and customization for apps and its services by manipulating the network object database and its manipulators (commands, operators)



(3) Network equipment and controller optimized for virtualization

- North-boundary interface of various network equipment and controller





Project Organization

OOO Project Organization



- Aggregating the know-how and knowledge of network operator, Cloud operator and vender

NEC

Network operating platform software and wireless SDN

NTT Communications

SDN OAM Guideline (Integrated WAN and DC)

NTT

Software based SDN equipment platform

Fujitsu

Optical SDN

Hitachi

Packet Transport SDN



Ministry of Internal Affairs and Communications

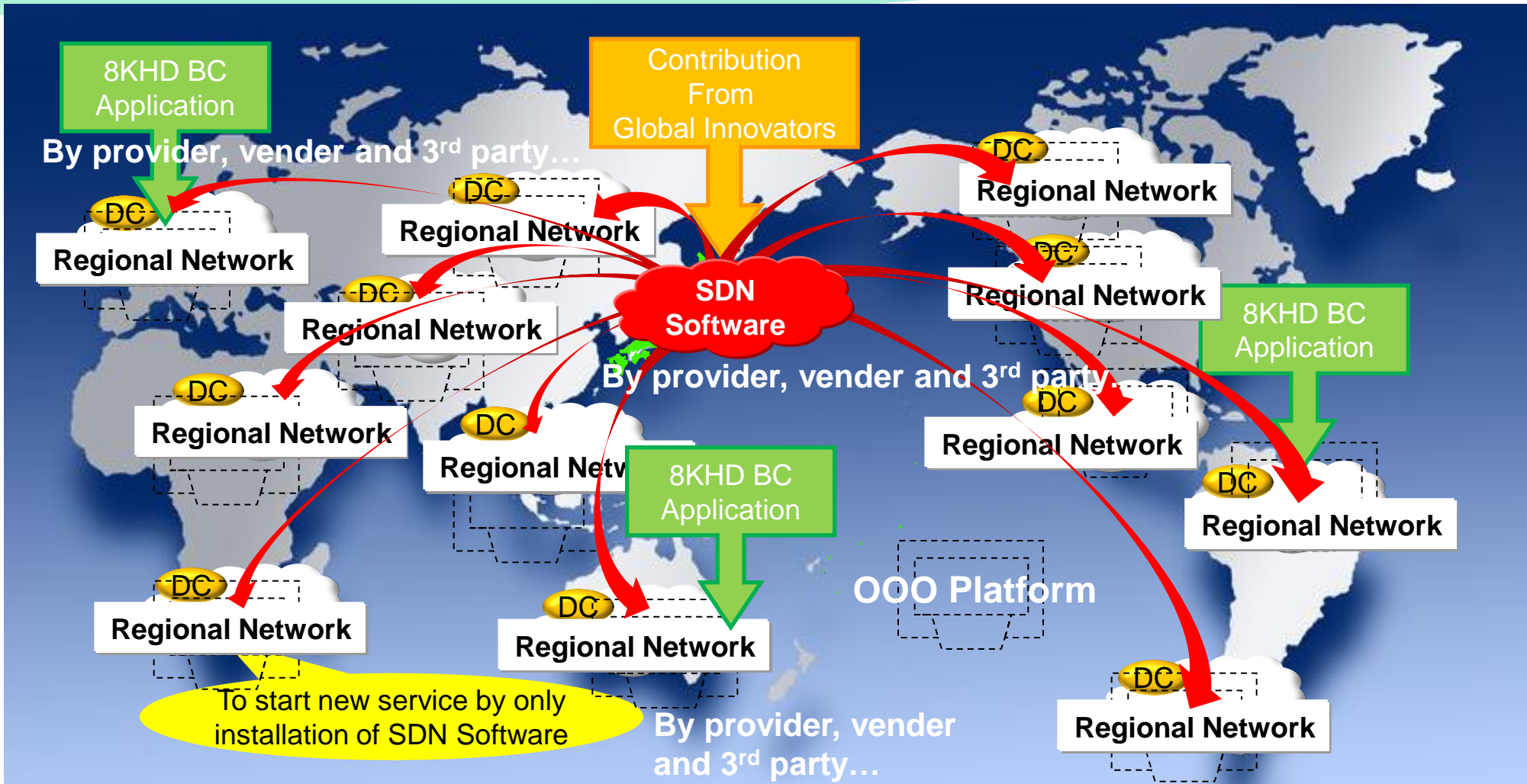


Future Vision of OOO

Provides common quality service to world customers



- Exchange SDN software for common platforms between service providers
- Customize each SDN software for own region and service





Thank you

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