The standardization of SDN and Chinatelecom network restructure based on SDN &NFV

YUAN ZHANG
Chinatelecom
2017.4.2

contents

- The standardization of SDN in ITU-T SG13
- The standardization of SDN in other SDOs
- SDN Open Source Organizations
- Chinatelecom CTNet2025 plan
- Conclusion

SDN standardization in ITU-T SG13

- SG13 has paid high attention to SDN related topics since the last study period, and becomes the leading study group for SDN in ITU-T.
- SG13 will continue the research in SDN areas in this study period.

Involved questions and research group from 2013-2016

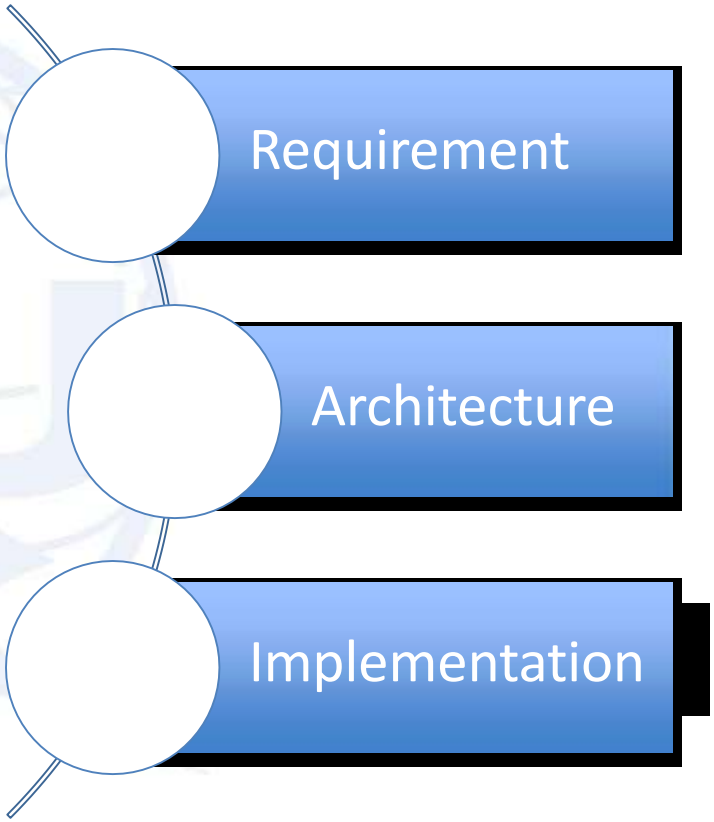
Q2	Q3
Q14	JCA-SDN

Involved questions and research group from 2017-2020

Q2	Q20
Q21	JCA-SDN

Published SDN Recommendations in ITU-T SG13

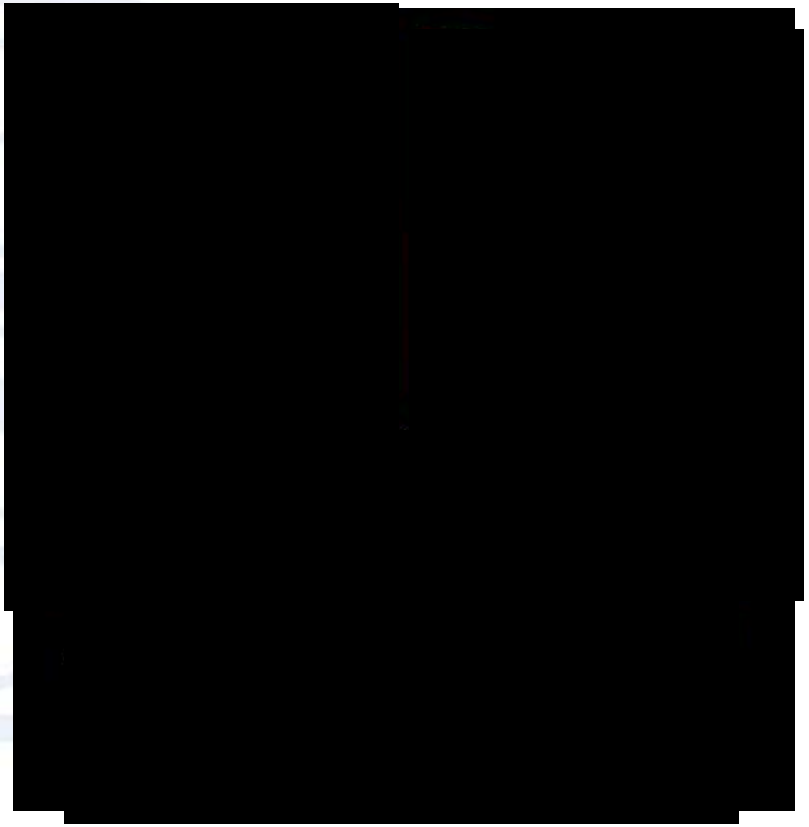
- **Y.3300:** Framework of software-defined networking
- **Y.3301:** Functional requirements of software-defined networking
- **Y.3302:** Functional architecture of software-defined networking
- **Y.3320:** Requirements for applying formal methods to software-defined networking
- **Y.3321:** Requirements and capability framework for NICE implementation making use of software-defined networking technologies
- **Y.3322:** Functional architecture for NICE implementation making use of software-defined networking technologies



Future researches related to SDN in ITU-T SG13

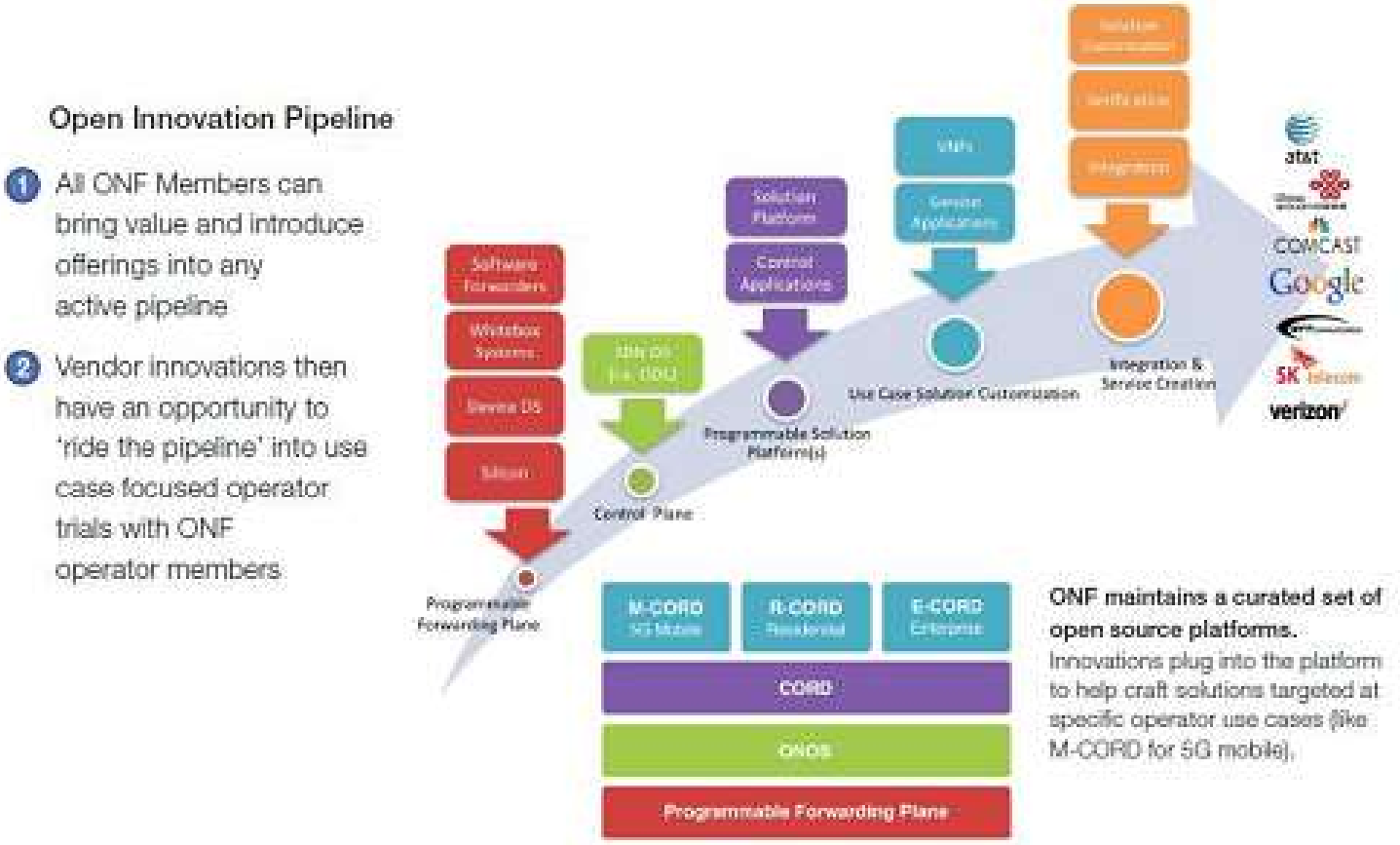
- Three major research areas in ITU-T SG13 require further study on SDN
  - IMT-2020 Q20
  - Orchestration Q21
  - Network evolution Q2

- Future research on SDN will focus on how to apply SDN technologies on different types of networks



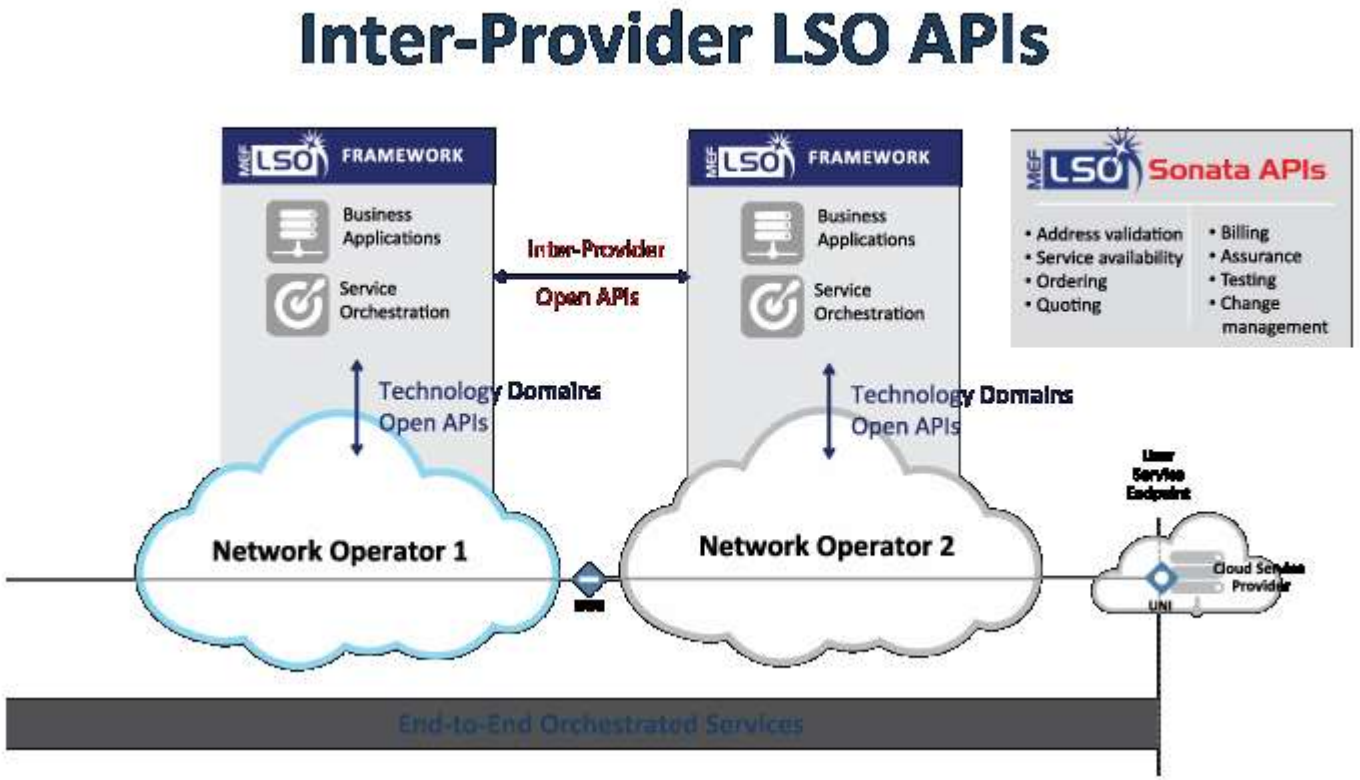
ONF: Accelerating Deployment with Open Innovation Pipeline

- https://www.opennetworking.org/



MEF、TM Forum are Teaming up with SP to Standardize LSO API

- standardize Lifecycle Services Orchestration (LSO) APIs)to orchestrate services across multiple networks
- The providers also leading the effort include AT&T, Orange, Colt, Comcast, Level 3, PCCW, Sparkle, Verizon, CableLabs, and Kyrio, to develop a suite of inter-provider LSO APIs that use the MEF LSO Framework and the TM Forum Open API framework.



IETF: SDN standards / Southbound protocols, NFV, service chains

- **The IETF SDN standards group, I2RS, work on southbound programming protocols, NFV and network service chains.**

- By the end of 2016, Request Publication of Protocol Independent Topology Data Models
  draft-ietf-i2rs-yang-l2-network-topology
  draft-ietf-i2rs-yang-l3-topology
  draft-ietf-i2rs-yang-network-topo

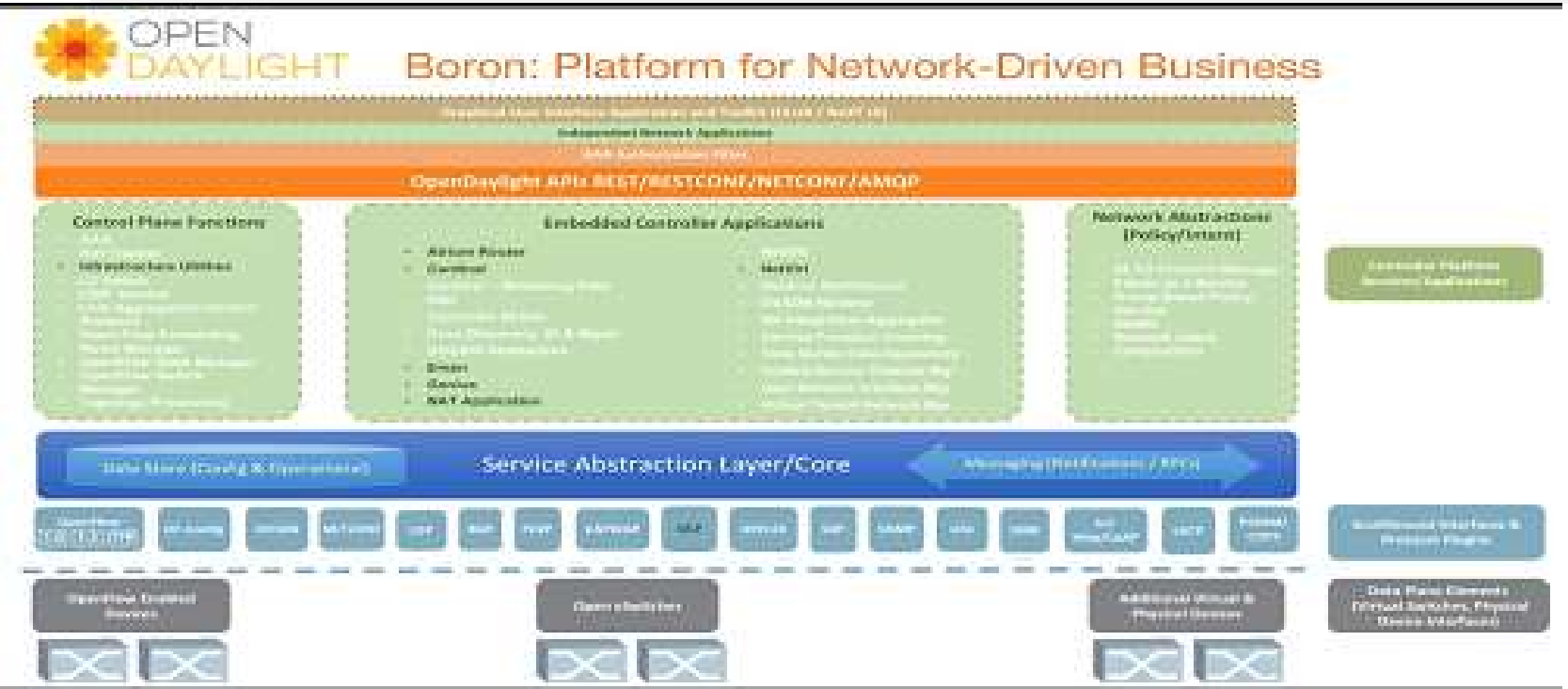
ONAP：Open-O Merges with ECOMP

- The goal(Open Network Automation Platform) of ONAP is to enable end users to design, orchestrate, manage, and automate network services and virtual functions
- Open-O and ECOMP codes combining and transmitting are in process

ODL: the open source platform for programmable, software-defined networks

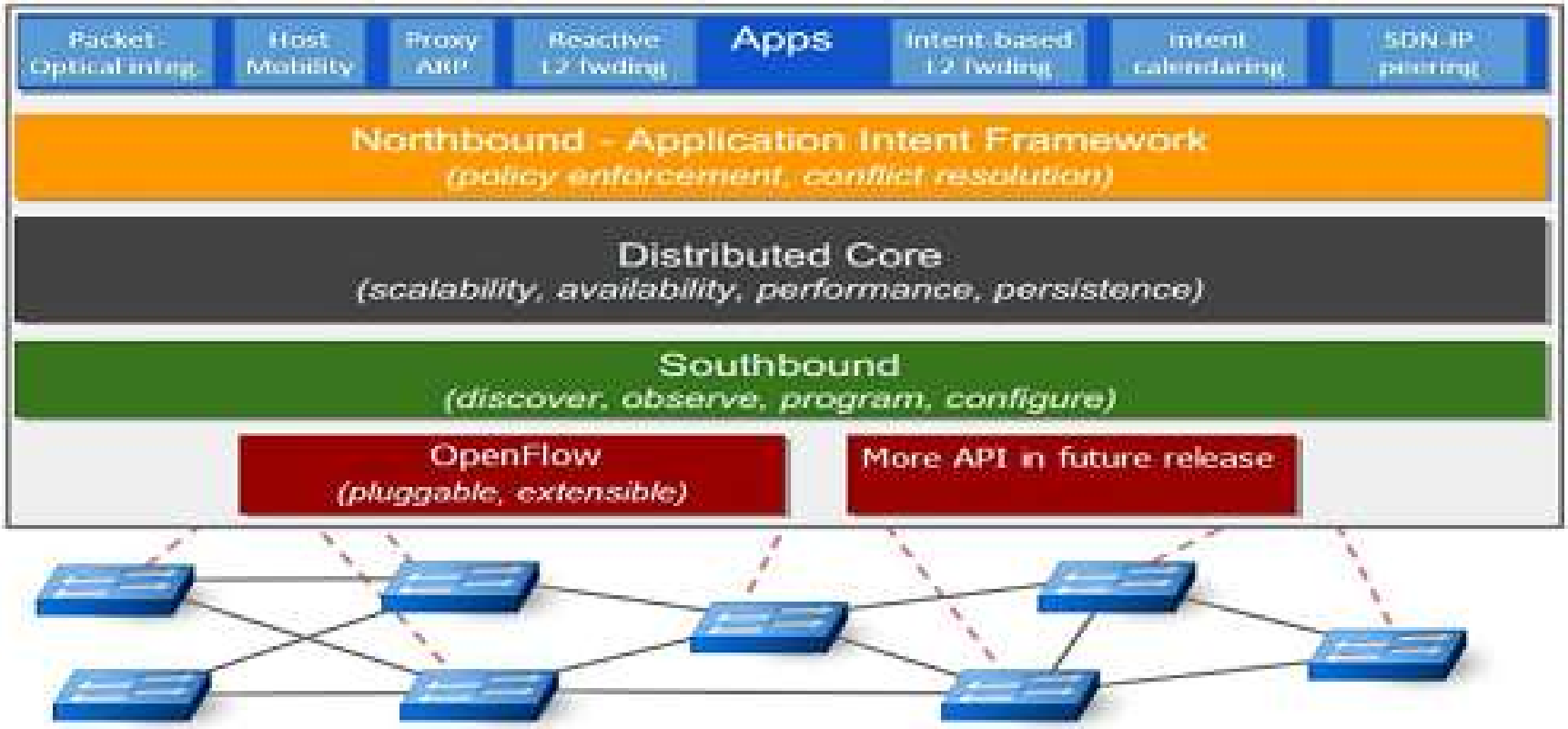
- **New Features in ODL Boron(5th Release)**

1. YangIDE, led by AT&T, provides support for building new YANG models
2. Telefonica and Intel-led NetIDE, which makes it easier to share apps across controller deployments
3. EMAN, led by Comcast, for improved energy efficiency for the network

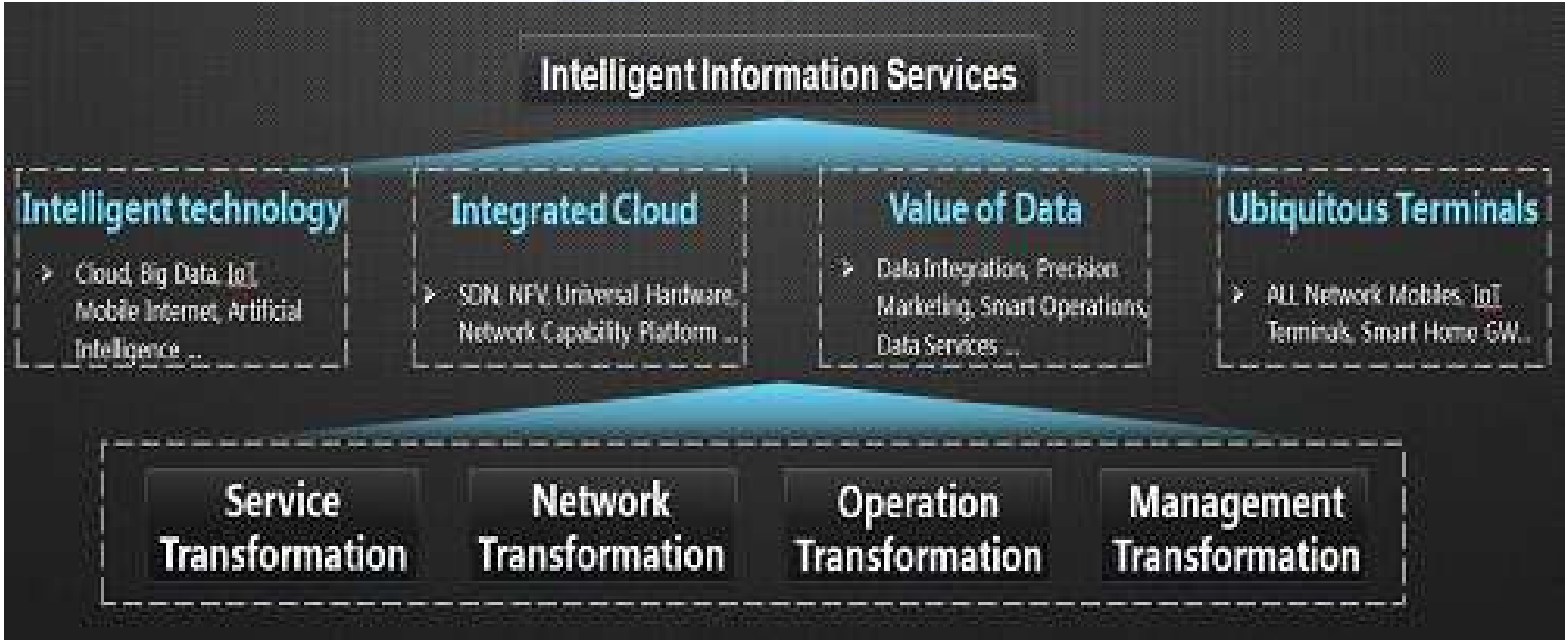


ONOS: ON.Lab + CORD + ONOS

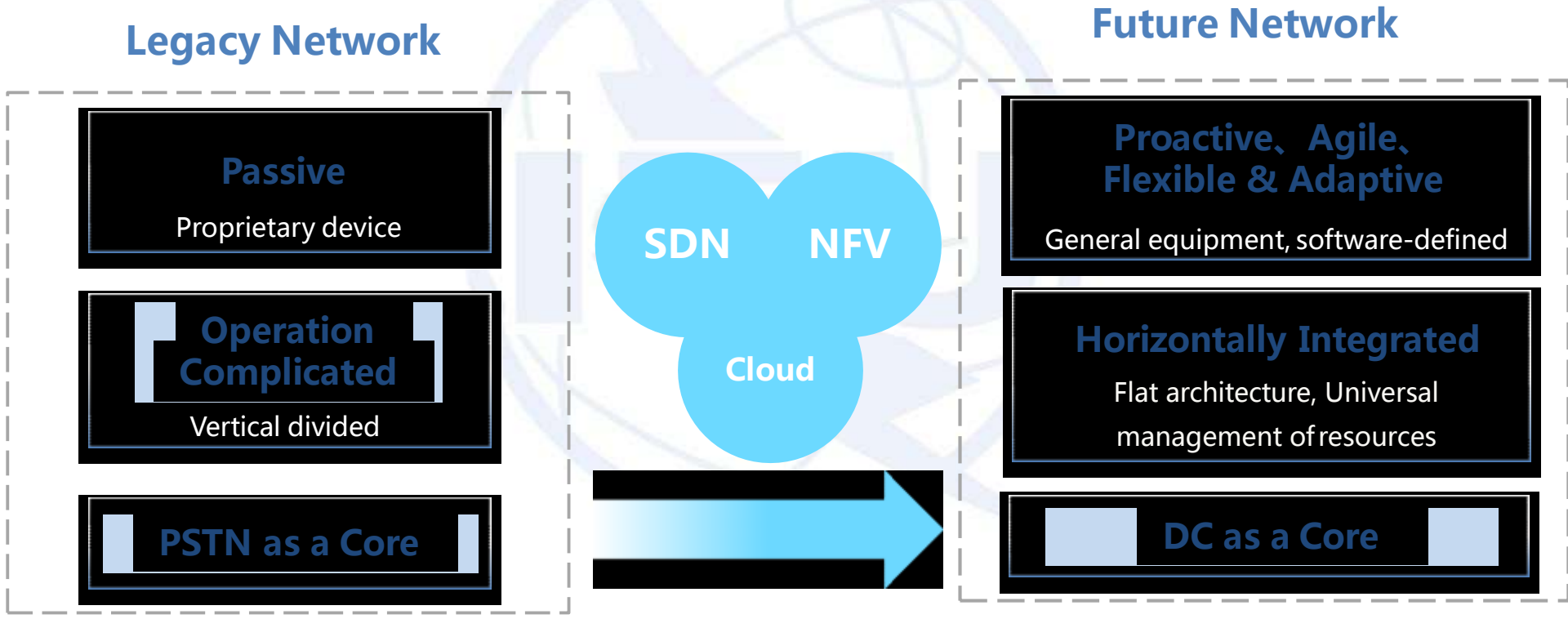
- **February 14, 2017** ON.Lab, with CORD® and ONOS®, brought together operators, vendors and integrators to build solutions for carrier networks by leveraging SDN, NFV and Cloud technologies through an open source approach to solution creation



Chinatelecom's New Strategy: To be Intelligent information Service Provider



Network Transformation Based on New Technologies



Network Transformation Road Map

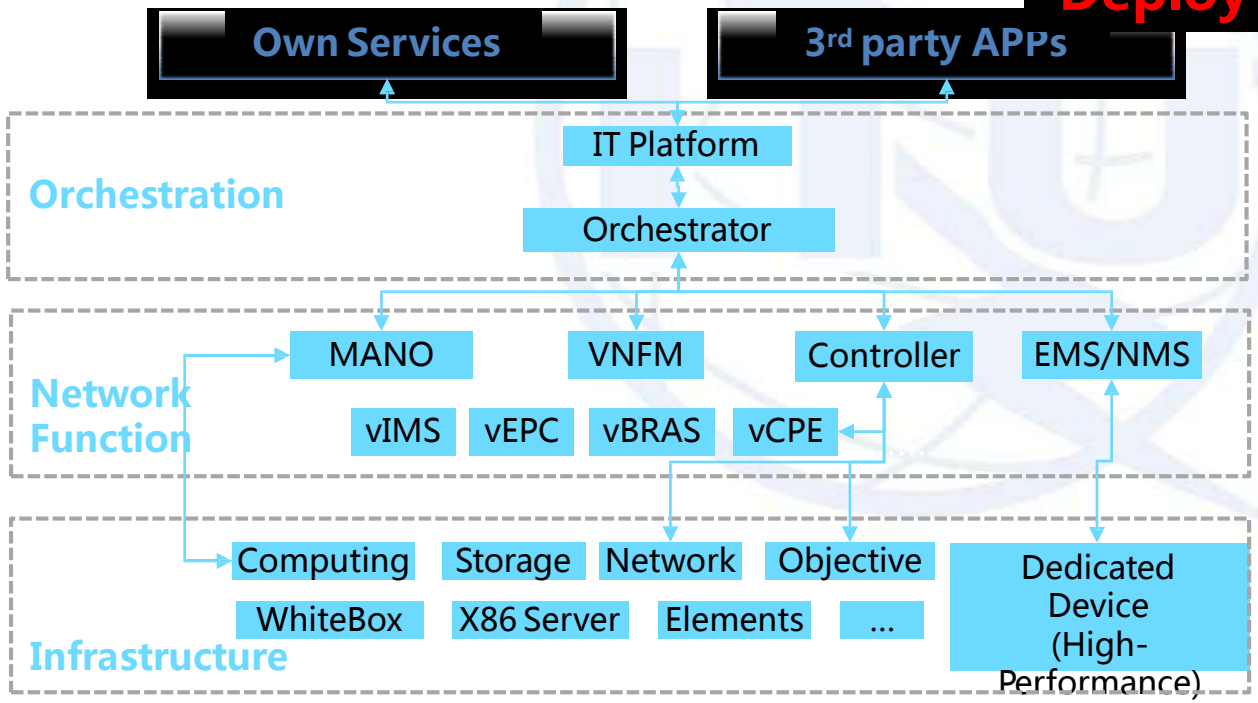
SDN/NFV for New Network , Properly Handle Legacy ,
Step by step , Moving towards DevOps

Network Transformation: CTNet2025 Target Network

80% NF Virtualized

Large-scale on-demand Service

Deploy New Operation System

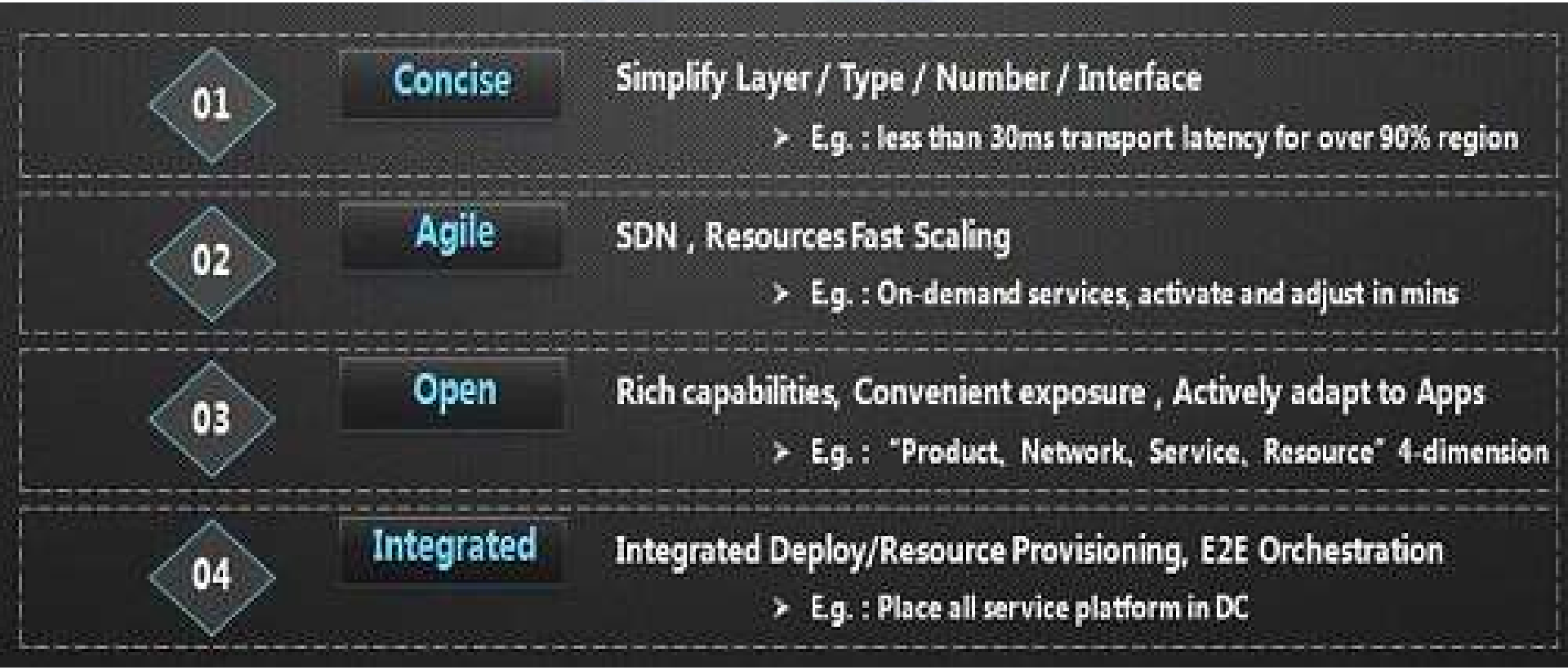


- Network Function Orchestration
- Service Orchestration

- Virtualized Network Function
- Integrated Resource Management

- Generalized Virtual Resource & Standardized Hardware
- High-performance Traffic Forwarding

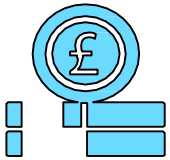
Characteristics for CTNet2025



Realization of CTNet2025: 3 Main Categories of Projects

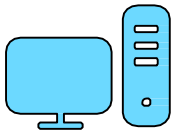
Fundamental Research

- Solve fundamental technical problems, provide prospective/systematic strategy



Network Deployment

- Based on mature industry chain， technology ready for trial or scale commercial deployment



Product Development

- Provide new product and user experience by innovation ，build up DevOps system

Create CTNet2025 Ecosystem

- Introduce Open Source Software
- Build up a new generation of Operation System

- Encapsulate Network Capability for Exposure
- Build up Network with rich Apps

- Collaboration between Industry/ Academic/ Research Institute
- Create a new Cooperation Paradigm

Conclusion

- ITU-T, ONF,IETF,MEF are focusing on SDN standardizations, including architecture, interface, Lifecycle Services Orchestration etc.
- Open source organization become more important
- Operator use SDN/NFV technologies to restructure networks

Thank you for attention!