


# The future of network and service automation

A person is standing on a rooftop, looking out over a city skyline at night. The person is silhouetted against the bright lights of the city. The skyline is filled with tall buildings, many of which are lit up with various colors like blue, green, and red. The sky is dark, and the overall scene is a mix of urban lights and natural darkness.

Timo Perälä

Nokia

September 2018

# The future of digital service delivery from Digital Service Providers (DSPs)

## Traditional CSP

- **Focus on “elephant” mass-market services** that can justify the cost & time
- **Expensive and slow** to get new service to market due to **complex** OSS/BSS systems, and **manual processes**



## Cloud Transformation

- **Webscales** deliver rapid, personalized, on-demand services - leverage **cloud automation** but mainly **over the top delivery**
- **CSPs** starting to evolve with **NFV/SDN** to speed the delivery of network services



## Future DSP

- Digital experience: broad array of new services that **combine cloud services and network resources**
- **Tailor virtual networks for each use case:** latency, bandwidth, security, choice of functions
- Agile network: services are **rapidly** trialed, deployed & scaled
- Open platform: **ecosystem of** cloud and network **players**

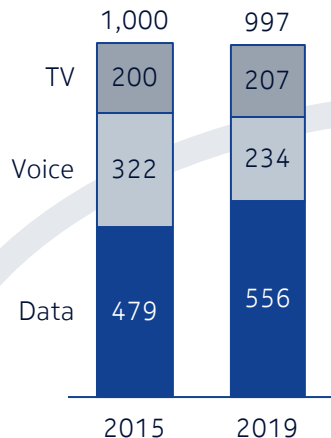


Source: Analysys Mason

New Markets | Faster New Services | Faster Time to Revenue | Higher Customer Satisfaction

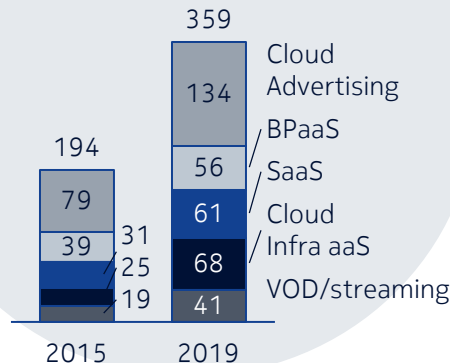
# The economic incentive to find new revenue sources is clear for today's CSPs

## Traditional CSP service revenues in mature markets\* (\$B) are flat



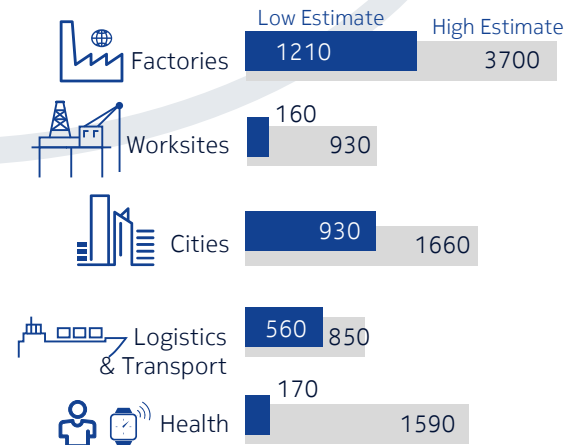
\* Western Europe, Canada, USA, Japan, South Korea, Singapore, Australia, and NZ  
Source: Gartner

## Cloud Services (\$B) have strong growth but value captured by CSPs has been limited



Source: Gartner  
BPaaS = Business Processes as a Service

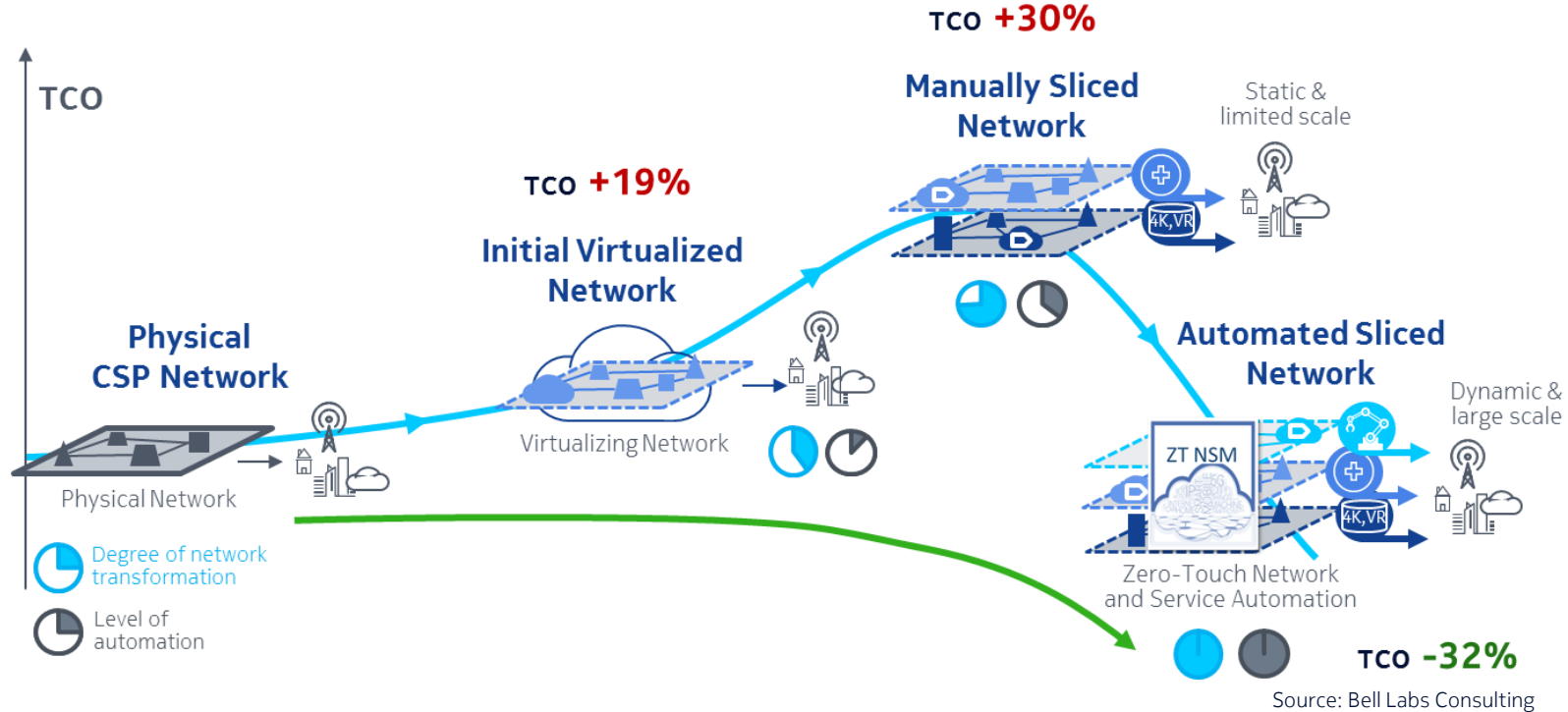
## Future DSP markets (\$B in 2025) offer revenue expansion for CSPs



Estimated 2025 value creation potential of the IoT  
- McKinsey Global Institute

Connecting the Business to the Network: Value creation lies in smart services

# Network and Service Automation are essential to DSP economics

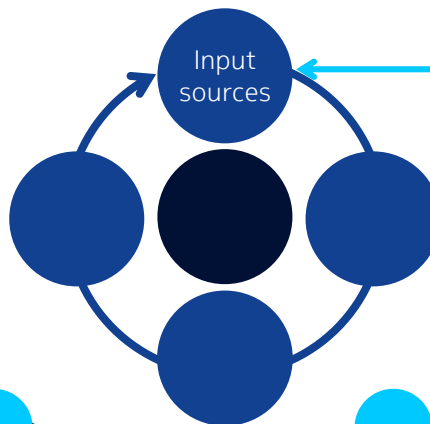


Without E2E automation NFV/SDN & network slicing add significant cost and complexity

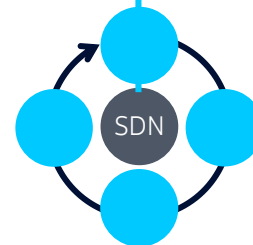
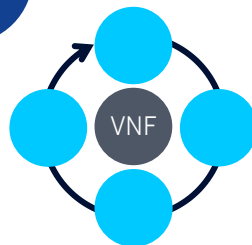
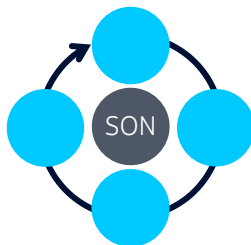
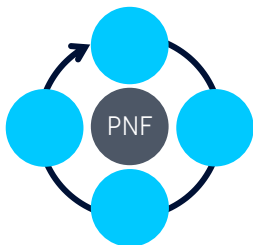
# Closed Loop Automation: there is no silver bullet

## Many loops are required

- Loops are autonomous
- Loops are best when local:
  - Pace
  - Accuracy
- But need to be abstracted northbound for E2E



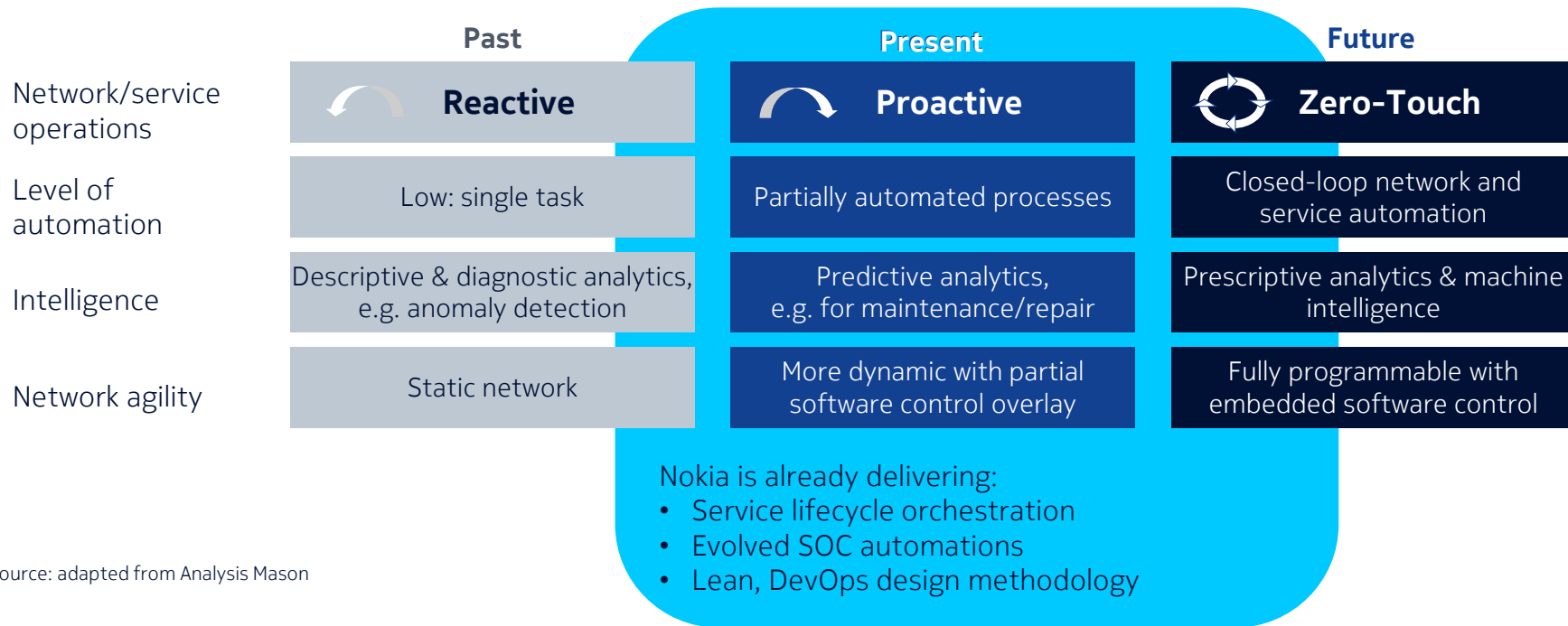
- By technology
- By region
- By legal entity
- For re-use
- For simplified abstraction
- For security



Closed loops at many layers, as local to the function as possible

# Perspective: Evolution of network management automation

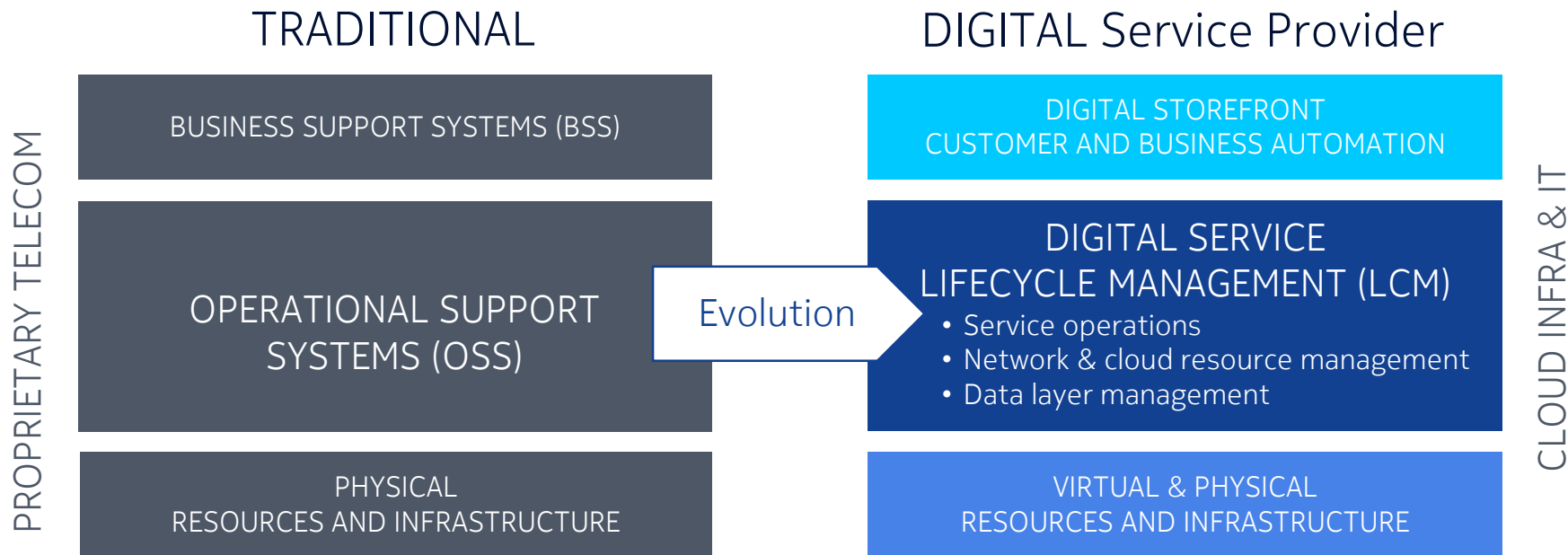
## From reactivity to zero-touch automation



Source: adapted from Analysis Mason

The challenge: to leverage new automation capabilities as part of a master program plan

# The shift: Transformation from CSP to DSP requires a new automation stack



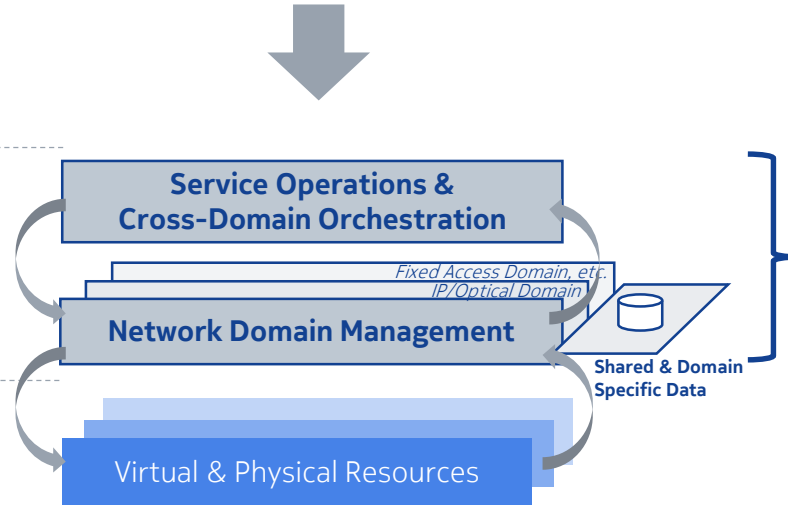
Managing complexity and agility of digital services requires a fully automated delivery platform

# The future architecture: What are we aiming for?

## DIGITAL Service Provider



## Areas of focus for this discussion



Two level architecture,  
each with similar  
operations functions  
including:

- Orchestration and fulfillment
- Topology and inventory
- Assurance and analytics
- DevOps

Service operations and network domain management with closed loop automation



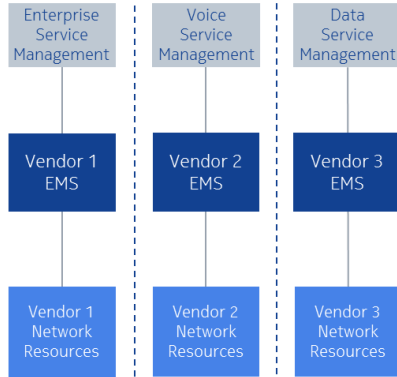
# Perspective: Evolution of network management architectures

## From silos and custom integration to full multi-domain automation

Increasing operational complexity

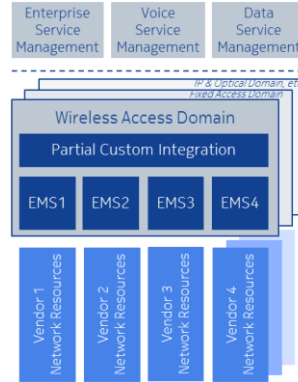
Operational agility and efficiency

### Single-Vendor Domains



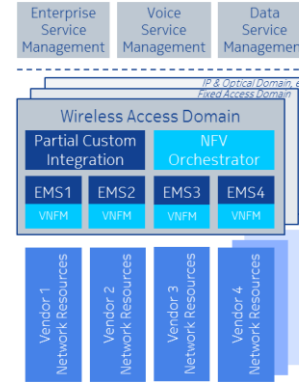
1980 - 2000

### Multi-Vendor Domains



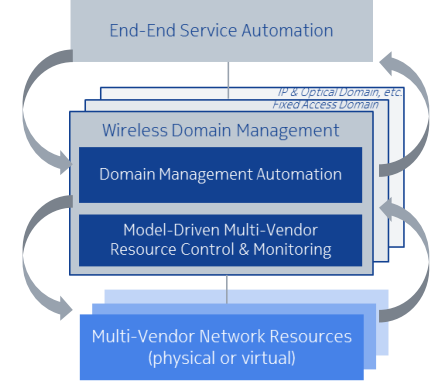
2000 - 2012

### Network Virtualization



2012 - 2018

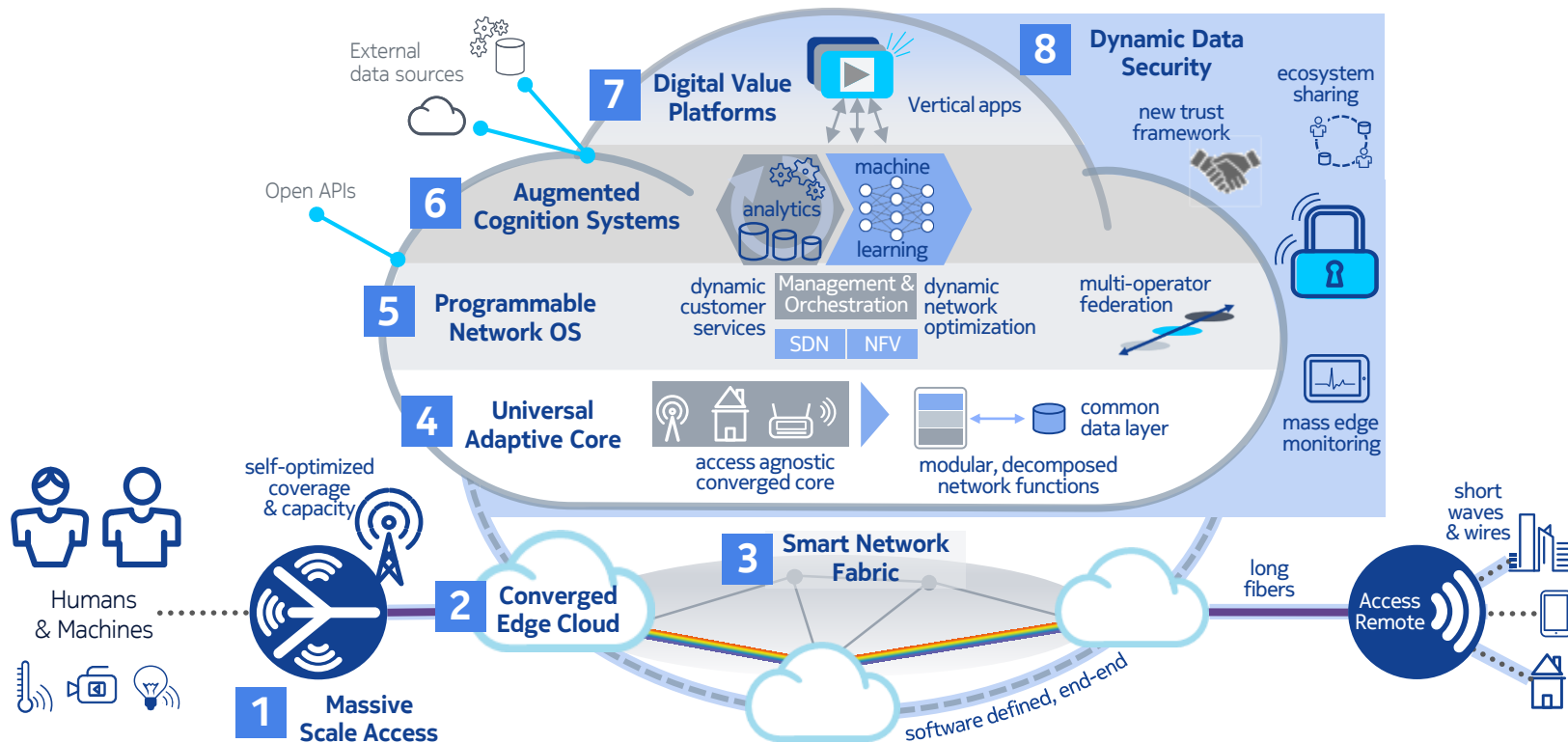
### Network Automation



Beyond 2018

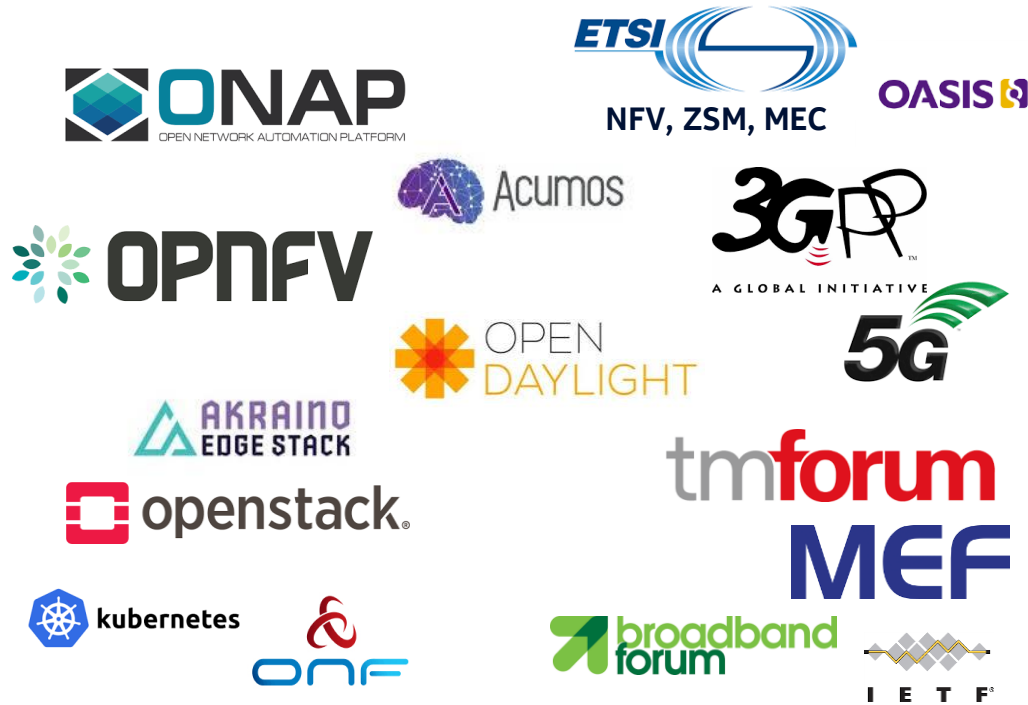
A new architecture is required to enable network and service automation

# High level architecture: The Future X Network



Future X Network: building the digital fabric for the automation of everything

# Industry alignment: Open Source and Standards collaboration



- Reuse, do not reinvent
- Industry has collaboratively defined and agreed on models, interfaces, etc. collateral. Let's (re)use those
- On concurrent industry collaboration, agree on meaningful work split between organisations

There is a requirement to leverage the best of multiple industry initiatives

# Summary

We must automate the network

Automation is difficult

Automation is most powerful when the domains cross silos and work together

To bridge silos, we must re-architect the service and domain management layers using a loosely coupled framework to achieve increasing automation over time

We are in this together

# Thank you!

