Telco Cloud transformation for the 5G era

Multiple challenges to deliver agility, value & service quality

Containers

Microservices

Open APIs

Virtual Machines

Multivendor Integration

Cloud Silos

Cloud Outcomes

JUNIPER
NETWORKS
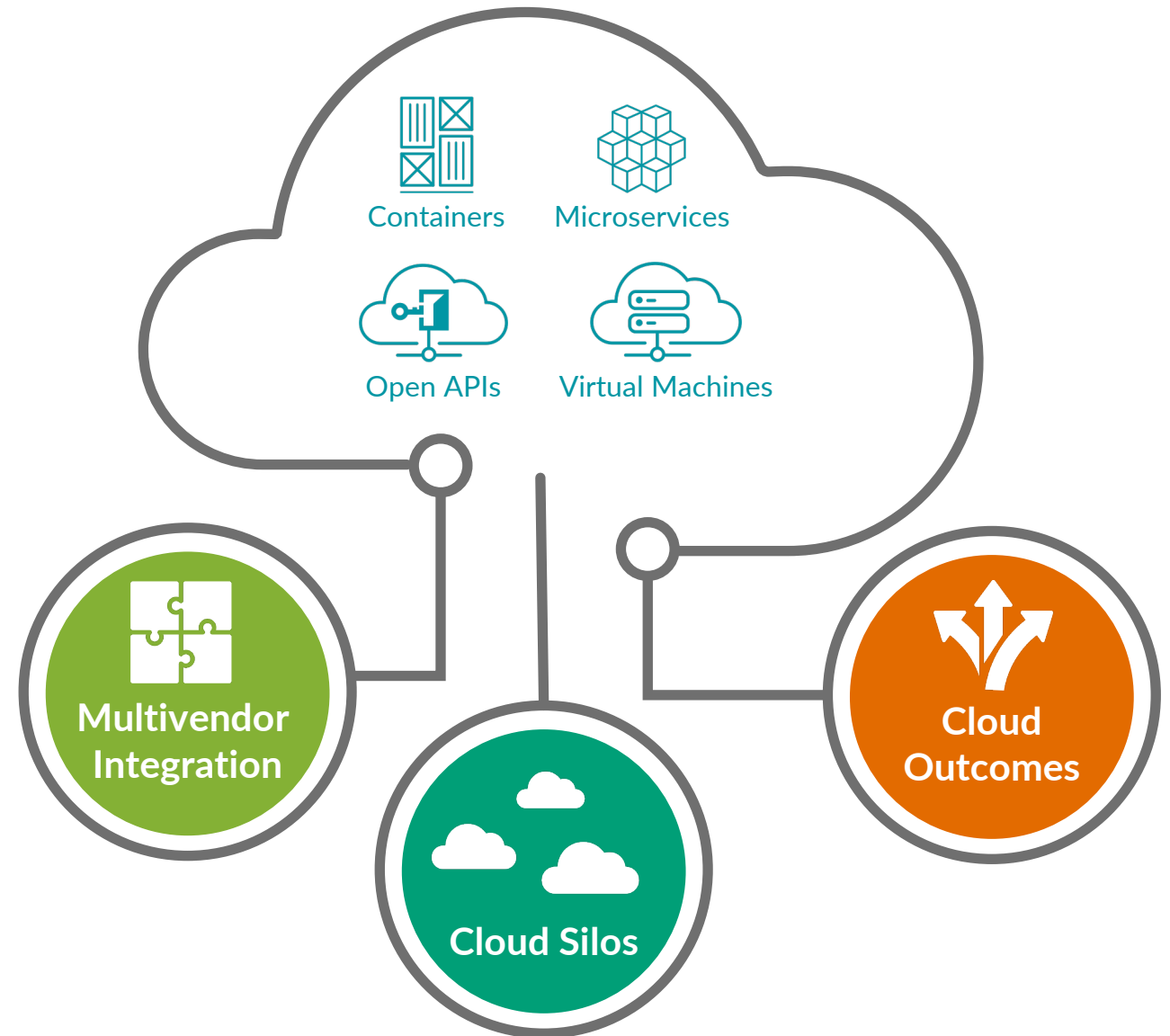
DT's Vision – laying the foundation for success
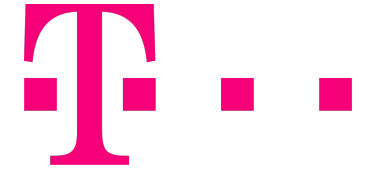
Leading in customer experience, leading in technology, and leading in business productivity.
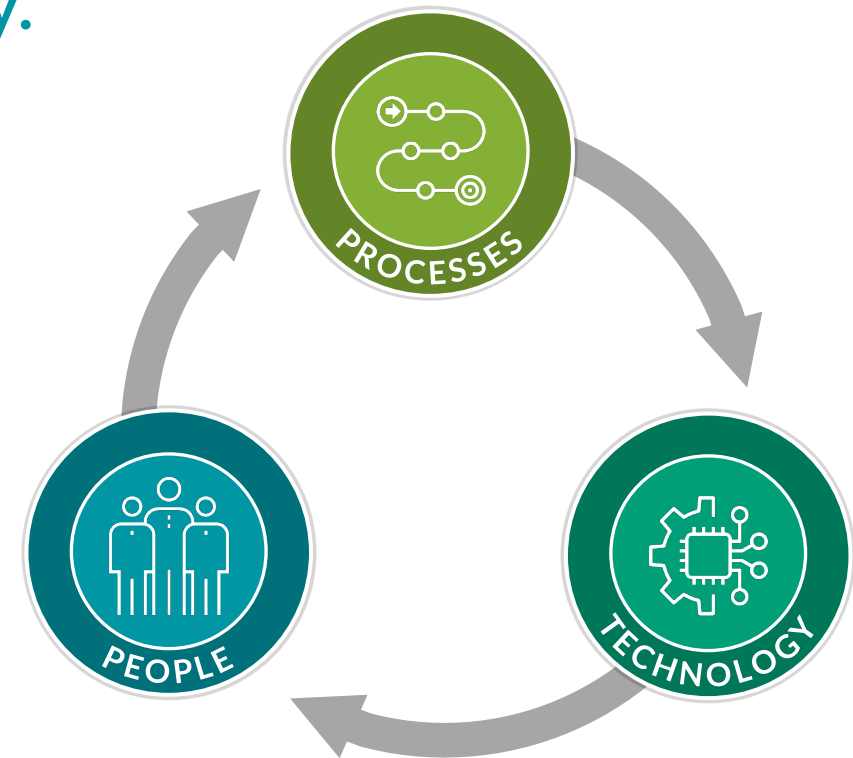
To achieve future growth
As more than an infrastructure company

Partner in the digital world
Home and work, anytime and anyplace

Making life easier and enriched
Connect everyone to the opportunities of now

...And it all started with Voice

Legacy IMS platform reached EOL

### Fixed voice is core part of DT's business

- 18M wireline voice customers
- 180 partner interconnects
- Residential, business, emergency & critical services

Legacy fixed network (IMS) reached its limit

- 2017 End of Life (EoL)
- 2020/2021 End of Service (EoS)

DT's goals for next-gen voice transformation

- Modernize the IMS platform
- Migrate all business and residential customers
- Deliver all existing advanced voice services
- Maintain exceptional service quality and experience
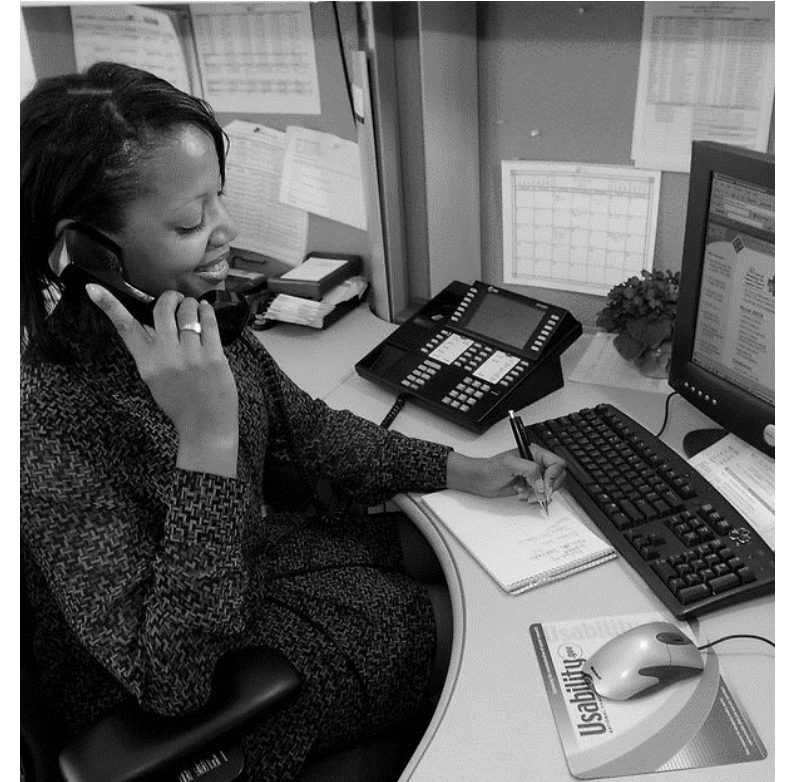
DT's bold cloud transformation goals

Faster TTM: going from up to 2 years, down to <3 months for new services

Test automation: from 40% to 100%

SW upgrades: from night/off-hour to daily and in-service

SW quality: from 5-6 deliveries to get it right to 1 single code drop

SW validation: from months to seconds

Feature development: from supplier driven to DT + Supplier driven

SW Validation Timeframe: from 9-5 work week schedule to continuous, 24x7 operation
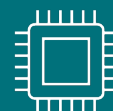
Max CPU/Mem load: from 30% to 80%

Bold goals driven by bold leadership

"Cloud transformation has started. For [DT] this is absolutely important and is currently revolutionizing our industry."

Christoph Hilz – DT SVP

New Levels of Automation	Software validation in seconds rather than days and testing and change management that are 100% automated through a 24x7 CI/CD pipeline
New Organizational Skills & Processes	Move the organization from its original waterfall/sequential software delivery process to a full lean/agile CI/CD process
New Vendor Relationships	A new relationship with vendors in which they become deeply integrated partners that collaborate to bring DT's fixed IMS architecture and automation to life

Delivering on the vision with 3-2-1-0 strategy

3 Months from idea to production

2 Days for SW release validation and live deployment

1 Day for SW patch validation and live deployment
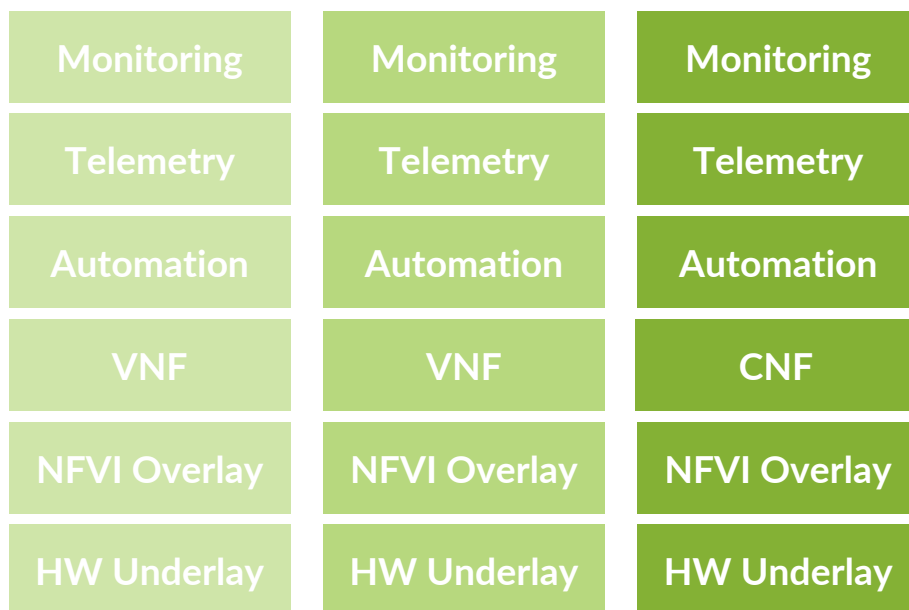
0 Maintenance windows (normal, 9-5 daytime operations)
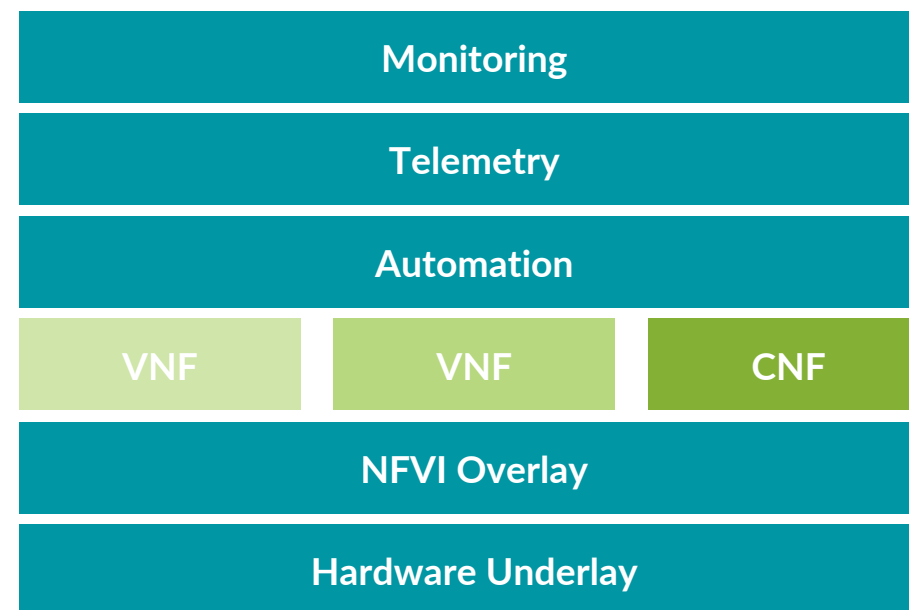
How? Platform-led vs. VNF-led bold technology choice

VNF-led

"We need to virtualise XYZ"

Monitoring	Monitoring	Monitoring
Telemetry	Telemetry	Telemetry
Automation	Automation	Automation
VNF	VNF	CNF
NFVI Overlay	NFVI Overlay	NFVI Overlay
HW Underlay	HW Underlay	HW Underlay

Platform-led

"We want to build an innovation platform"

Monitoring		
Telemetry		
Automation		
VNF	VNF	CNF
NFVI Overlay		
Hardware Underlay		

DT needed a trusted partner with experience to deliver

Juniper was there at all the inflection points

Broadband Edge	IP Network Core	Mobile IP Security	IT Data Center	Telco Cloud
BRAS to BNG, supporting 21+M fixed line IP Customers	IP2, IP/MPLS Core network evolution	IPSec-based IP Mobile security and 5G readiness	T-Systems Data Center solutions	German and Pan-European telco cloud solutions and SD-WAN
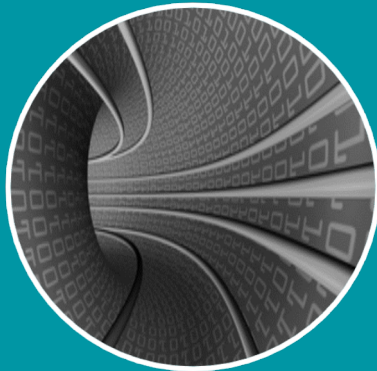
Blueprint for success – Automation-led

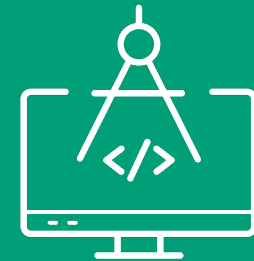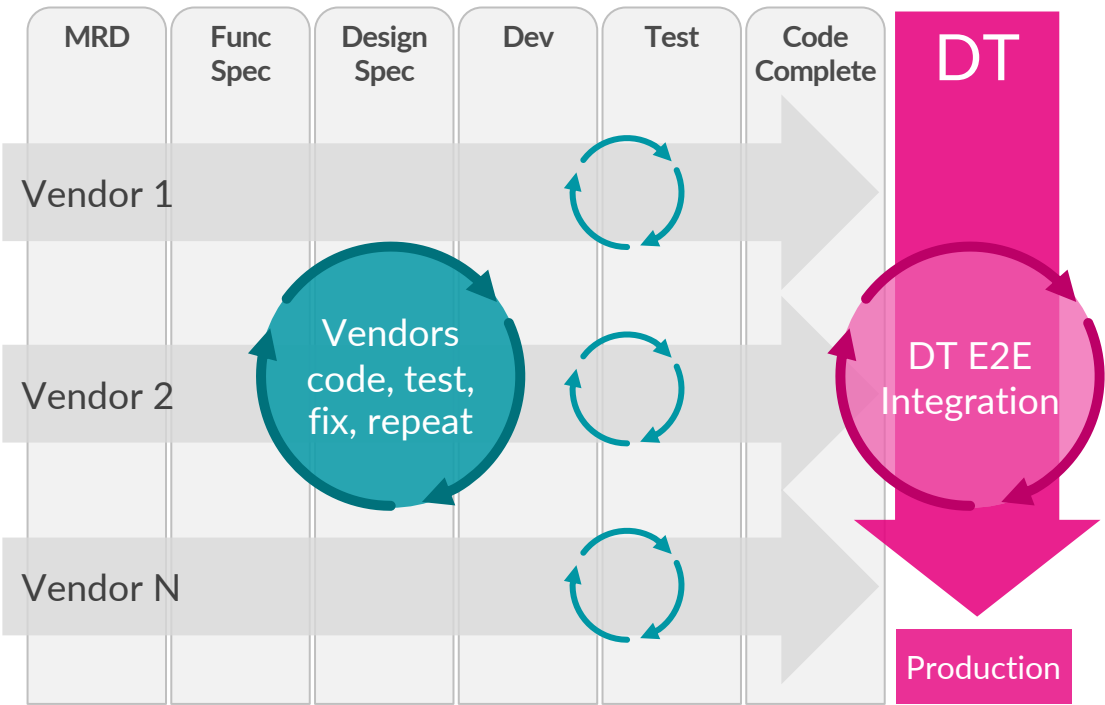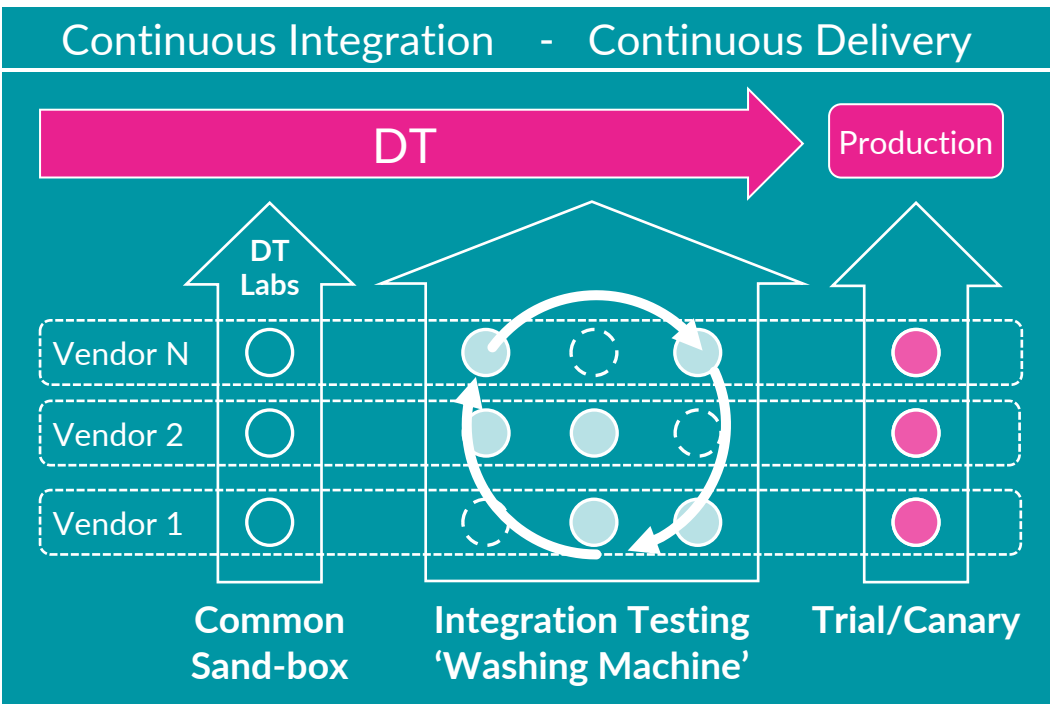| Comprehensive, E2E Automation	New Ways of Collaboration	State of the Art Architecture
Automation framework built upon CI/CD to treat the Business as Code	Interactive, multivendor, development model built upon DevOps principles	Universal, horizontal Telco Cloud platform for all cloud computing needs

Agile methodologies drives efficiency and quality

Comprehensive E2E automation

Traditional Waterfall Development Model

MRD	Func Spec	Design Spec	Dev	Test	Code Complete

Vendor 1

Vendor 2

Vendor N

Vendors code, test, fix, repeat

DT

DT E2E Integration

Production

NIMS Agile, DevOps Development Model

Continuous Integration - Continuous Delivery

DT

Production

DT Labs

Vendor N

Vendor 2

Vendor 1

Common Sand-box

Integration Testing 'Washing Machine'

Trial/Canary

"The marriage is happening in my lab."
Juniper Telco Cloud Council, 2019

NIMS Co-creation: the future of open value creation

New way of collaboration

Juniper - Prime Integrator & trusted partner

- History as technology and innovation partner
- VNF neutral, unbiased leadership
- Shared vision of an open, universal Telco Cloud

Best of breed co-creation ecosystem

- Solution delivery that is DT + Partner driven
- Supplier vendors collaborate as an eco-system
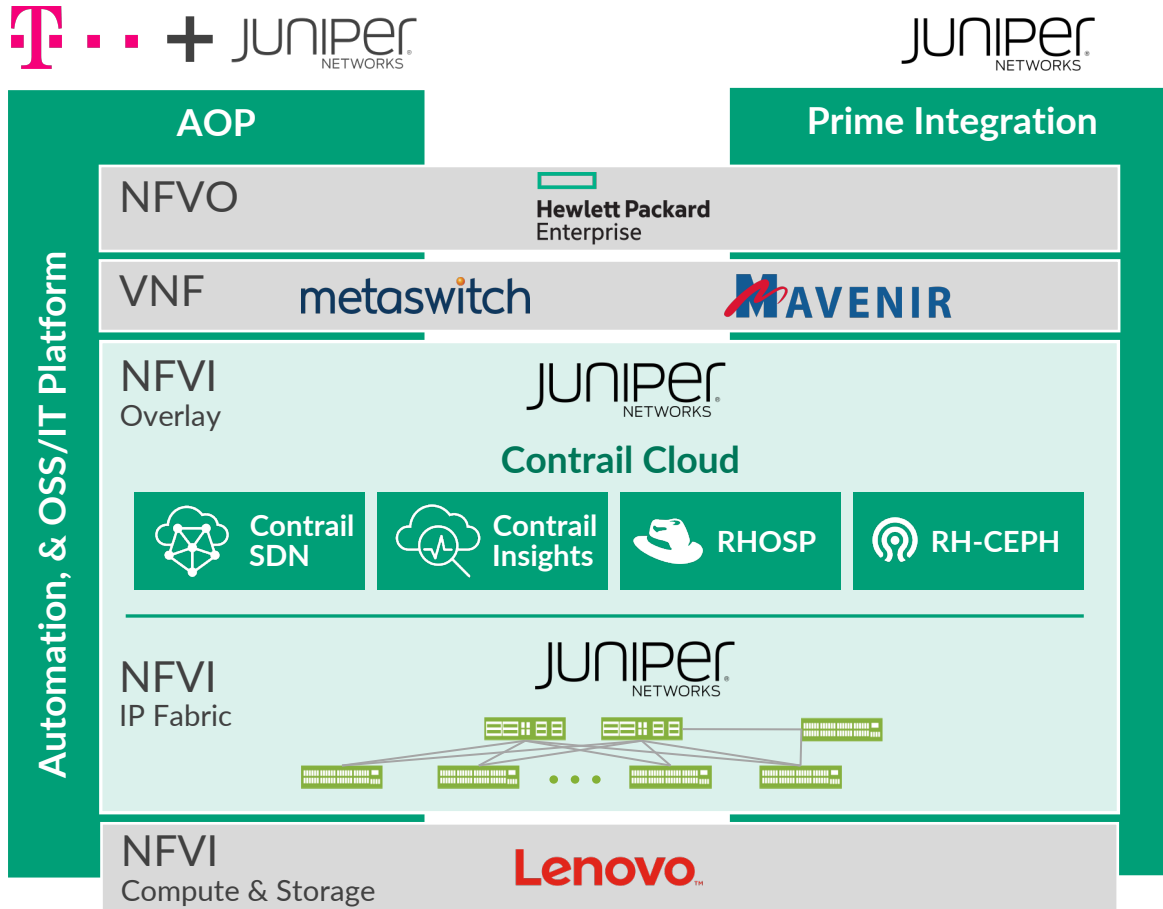- Co-dependency to succeed (or fail) together

Co-creation agility on steroids

- Multi-vendor scrum teams for all Streams
- Scale Agile Framework aligns Business Goals to code
- DevOps Squads align Dev + Ops & reduce timescales
- Common lab environments for agile integration
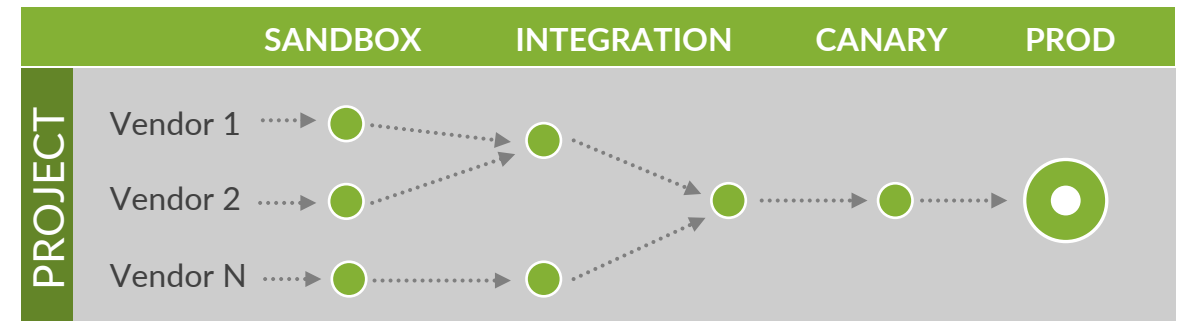
Cloud first, universal Telco Cloud foundation
State of the art architecture

Secure & fully automated NFV Infrastructure

One automation platform - unifying analytics, telemetry, orchestration, management.

DevOps principles - methodologies to automate CI/CD pipeline.

Open platform – enforce vendor collaboration, minimize vendor lock, deliver performance.

Horizontal NFVI stack - widely deployed SDN controller, embedded security.

Cloud-scale fabric - End-to-end, carrier-grade underlay & overlay.

DT NIMS industry-first in Telco cloud transformation

2-Yr

Platform
Time to Deployment

Single vendor silo to multivendor cloud

22x

Time improvement
to update NFVI Infra:

18 Months to 16 days

97%

Automation of targeted
NFVI Test Cases

80% of total NFVI Test Cases

1 Day

Day 0 NFVI
Automation

Build and configure NFVI cloud

Helping operators transform in the Cloud + 5G + AI era

CLOUD ARCHITECTURE

JUNIPER AS A VALUED PARTNER

PEOPLE — Multivendor Collaboration → Prime & System Integrator

PROCESSES — E2E Automation → Automation Architect

TECHNOLOGY — Universal Cloud Architecture → Contrail 'Cloud-First' Telco & Edge Cloud

THANK YOU

JUNIPER NETWORKS | Engineering Simplicity