Software Defined Broadband Networks

Jon Mischel – Director, Product Management

NXTWORK2017
JUNIPER CUSTOMER SUMMIT

LEGAL DISCLAIMER

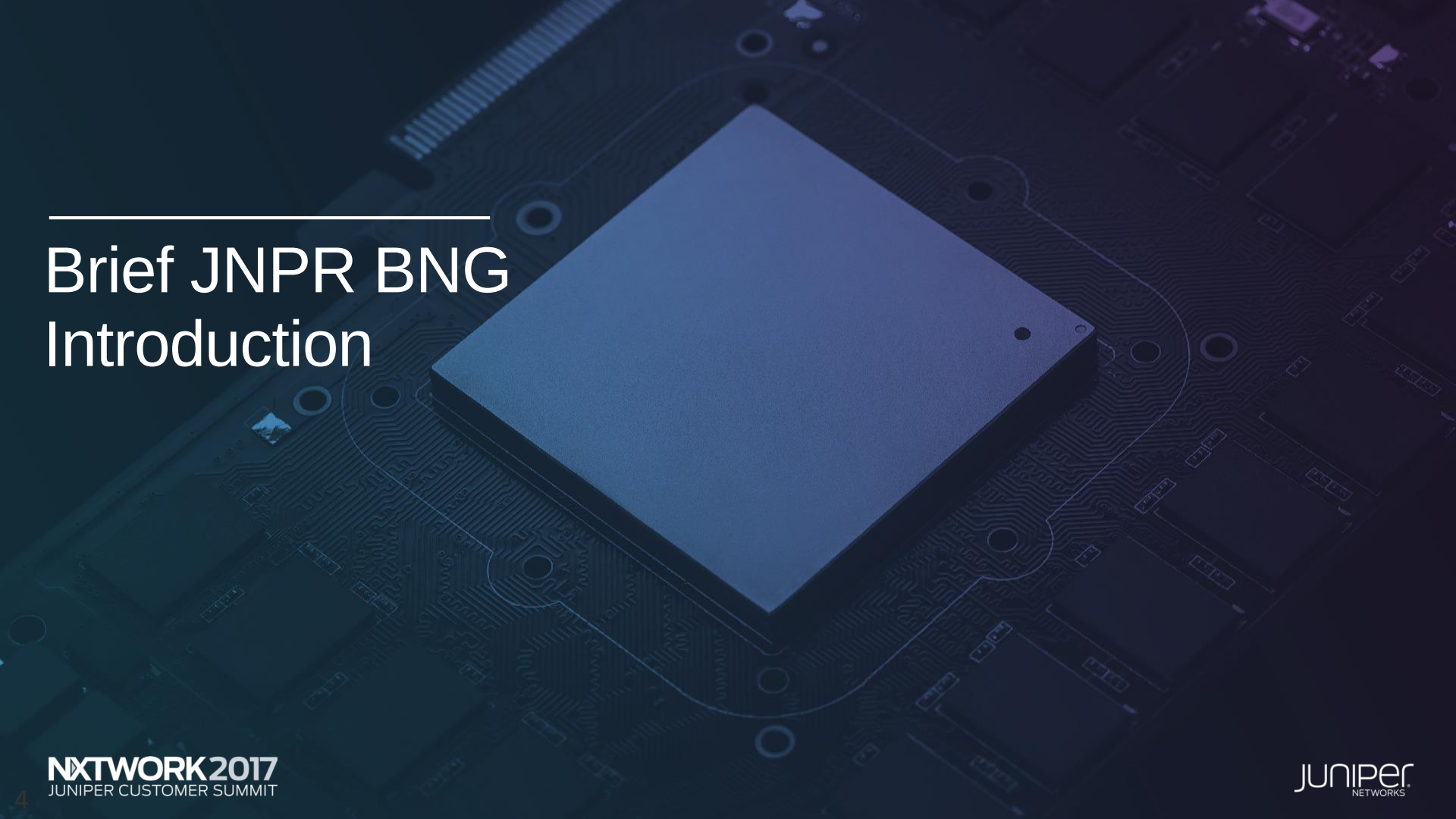
This statement of direction sets forth Juniper Networks' current intention and is subject to change at any time without notice. No purchases are contingent upon Juniper Networks delivering any feature or functionality depicted in this presentation.

This presentation contains proprietary roadmap information and should not be discussed or shared without a signed non-disclosure agreement (NDA).

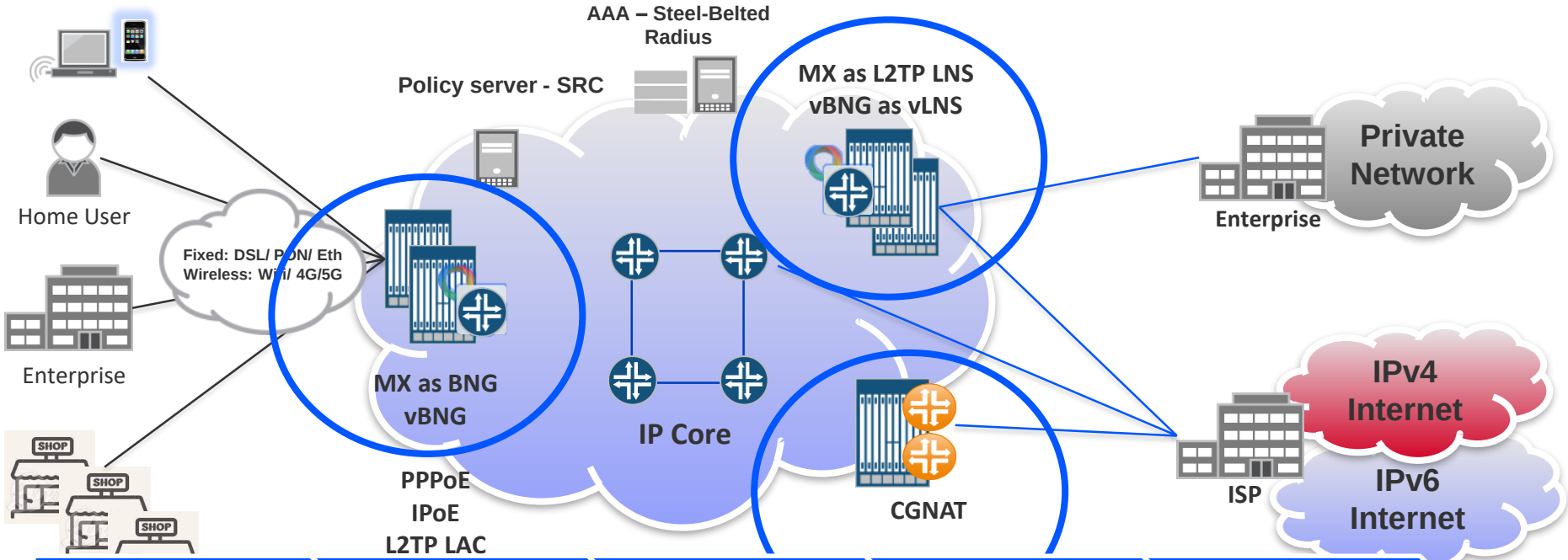
Agenda

- Brief overview of JNPR BNG
- Software Defined Broadband Networks
- Key Technology Investments

Brief JNPR BNG Introduction



Juniper Broadband Leadership by the numbers



16 of top 20 Service Providers globally use the MX BNG

17 Years of broadband industry leadership

350+ MX BNG customers

>8000 MX BNGs shipped

>250M sub licenses issued

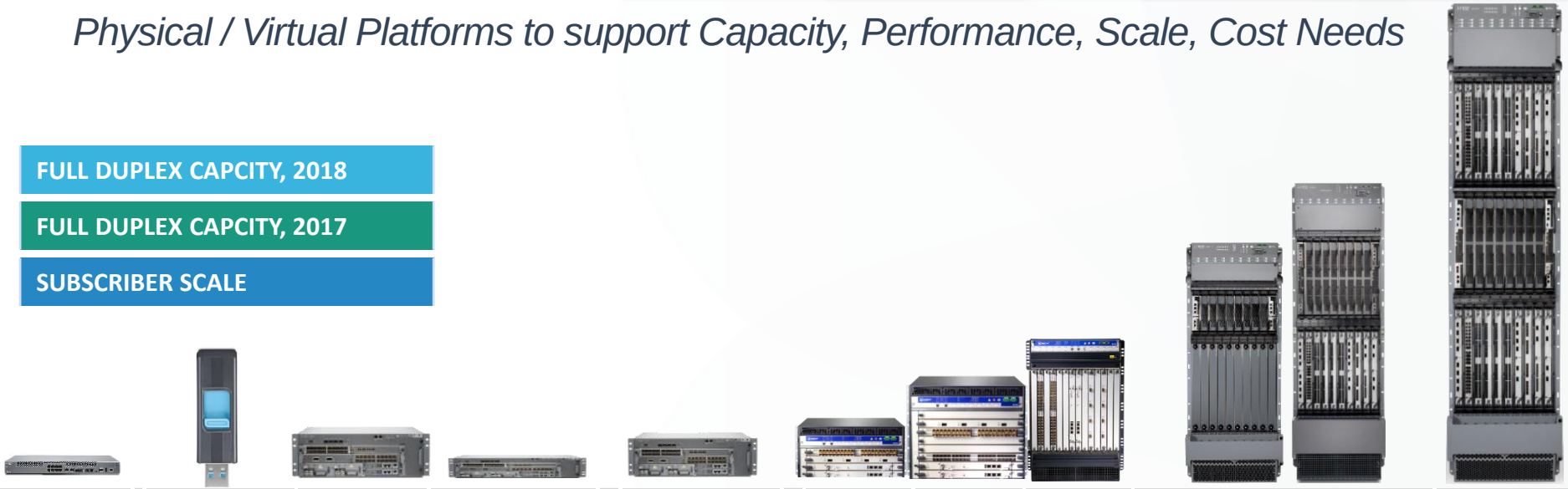
Juniper's Broadband Platform Portfolio

Physical / Virtual Platforms to support Capacity, Performance, Scale, Cost Needs

FULL DUPLEX CAPCITY, 2018

FULL DUPLEX CAPCITY, 2017

SUBSCRIBER SCALE

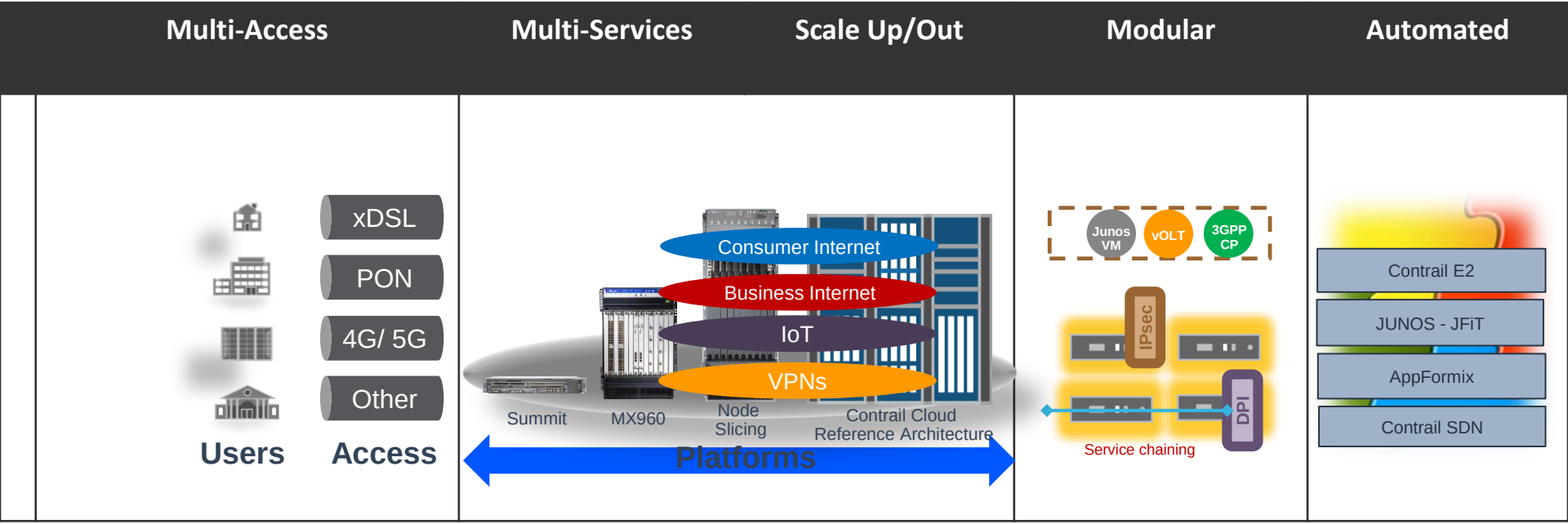


MX150	VMX	MX104	MX204	MX10003	MX240	MX480	MX960	MX2008-MX2010	MX2020
				6Tbps	3Tbps	8Tbps	15Tbps	40Tbps	80Tbps
20Gbps	Nx10Gbps	80Gbps	400Gbps	2.4Tbps	1Tbps	3Tbps	5Tbps	16Tbps	32Tbps
< 2K	Up to 32K			Up to 128K	Up to 512K				

SAME CONTROL PLANE SCALE ACROSS MX240 / 480 / 960 / MX2K

Software Defined Broadband Networks

SOFTWARE DEFINED BROADBAND NETWORKS (SDBN)

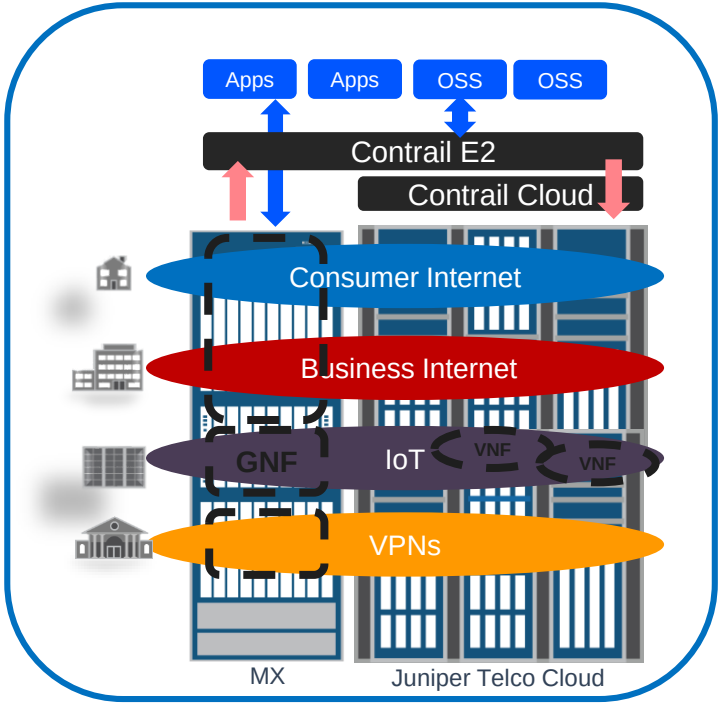


SD BROADBAND IS MULTI-SERVICES

Why?

- Shared infrastructure and real estate
- CAPEX sharing across use cases
- CAPEX sharing across wholesalers/retailers
- Service agility / innovation / mash-up
- Reduced # of integration points

- Universal Edge
- Network slicing – VNF and GNF
- Telco cloud
  - NFVI, SDN based overlays
- Elastic service placement



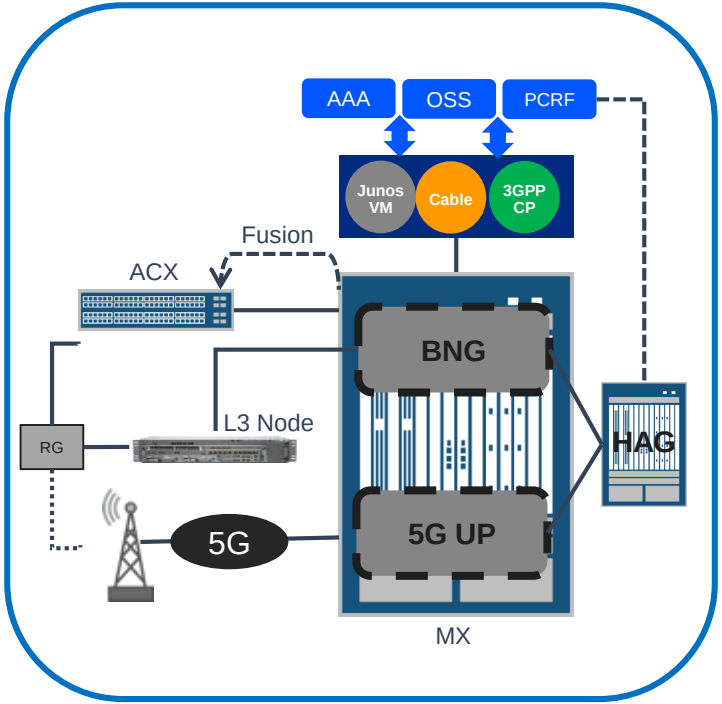
MX 3D – Node Slicing – Contrail Cloud – Elastic Edge (E2)

SD BROADBAND IS MULTI-ACCESS

Why?

- Shared infrastructure and real estate
- CAPEX sharing across use cases
- Seamless services
- Fixed mobile convergence
- Reduced integration costs (access abstraction)

- Access migration via Fusion
- Cable Subscribers
  - Packet trigger
- 5G and Convergence
  - Control User Plane Separation
- Hybrid Access
  - Dual homing fixed/mobile



Hybrid Access Gateway – MX User Plane – Node Slicing

SD BROADBAND SCALES UP AND OUT

Why?

- Distributed vs. Centralized
- Bandwidth growth
- Caching, latency
- On demand resources

- Continued hardware performance growth
  - ASIC, Line cards, Platforms
- Distributed edge
  - Small Edge
  - Satellites
- Virtualization and Scale out

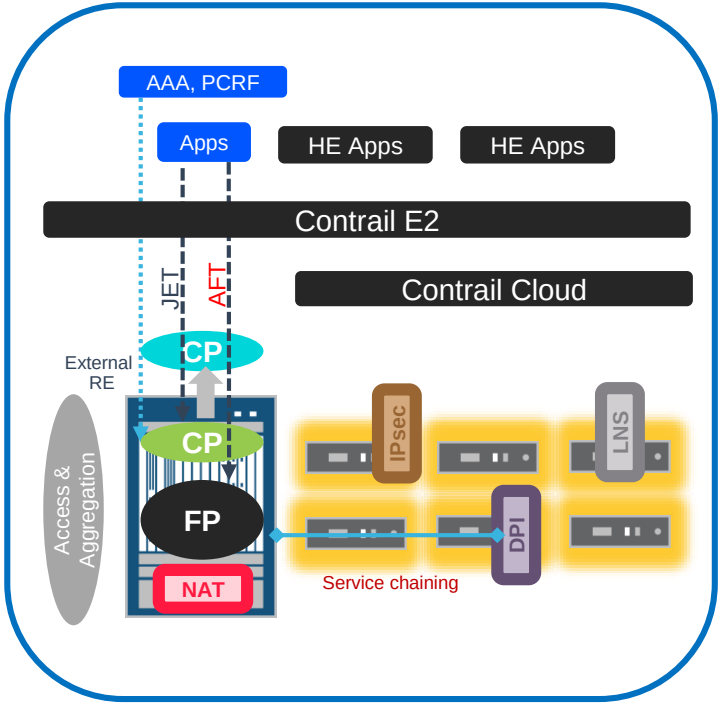
MX – vMX/vBNG – Fusion

SD BROADBAND IS MODULAR

Why?

- Disaggregation
- Micro services
- Multi vendor
- 3rd party applications
- Distributed service delivery (eg, network as a firewall, as a loadbalancer,…)

- Physical and Virtual
- Flexible value added services
  - Integrated, Chained
- Programmability APIs
  - Control Plane, Forwarding Plane
- Abstraction
  - Service placement, Broadband Application



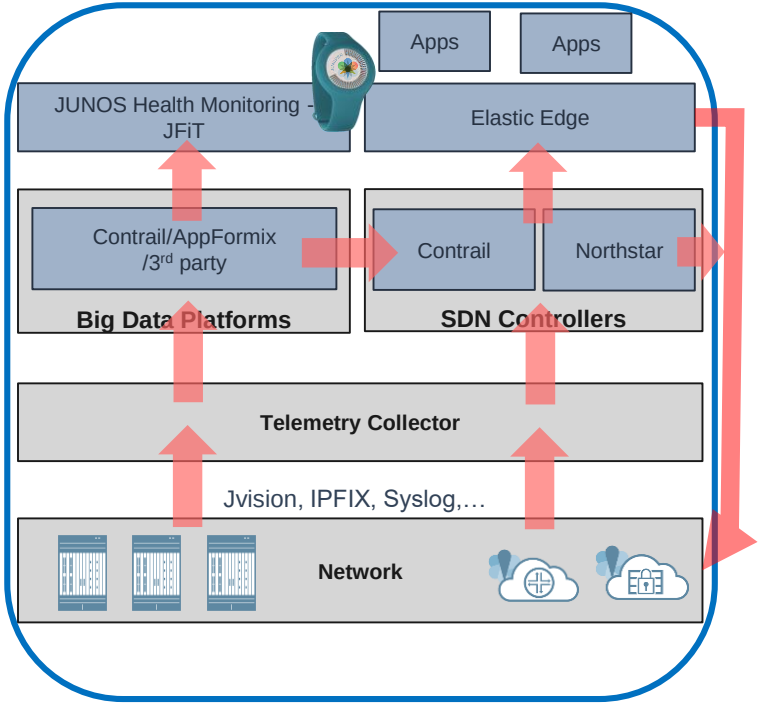
vMX/vBNG – Router Services – NERG - Elastic Edge - Hybrid Edge – BBE controller – Jet - AFT

SD BROADBAND IS AUTOMATED

Why?

- Cloudification
- Automated deployment and provisioning
- Smarter, cheaper monitoring and troubleshooting
- Workload (re)optimization
- Network as an API

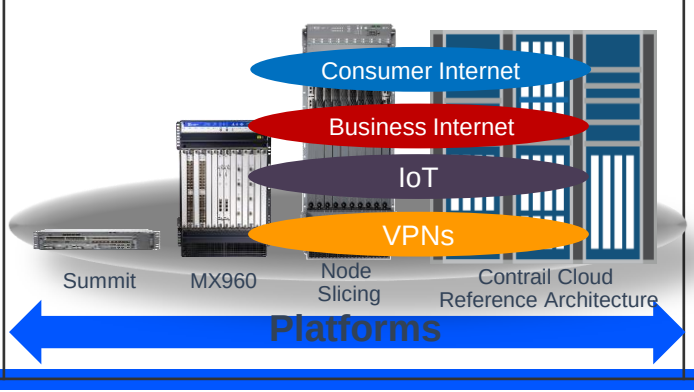
- Cloud based management
- Edge and DC controllers
- Telemetry sensors
- Collectors & Monitoring Application
- Feedback loop
- Intelligent Broadband

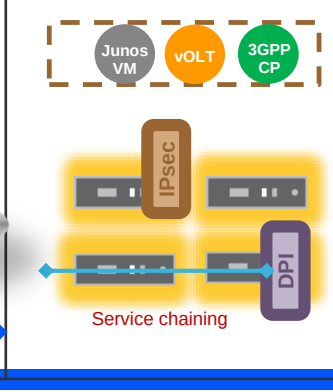


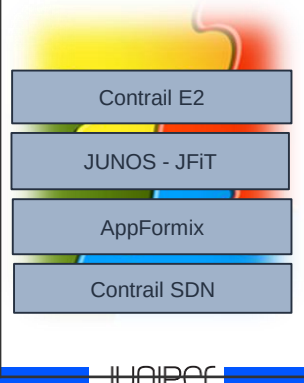
Jvision – Contrail - Elastic Edge – BBE controller

SD BROADBAND NETWORKS

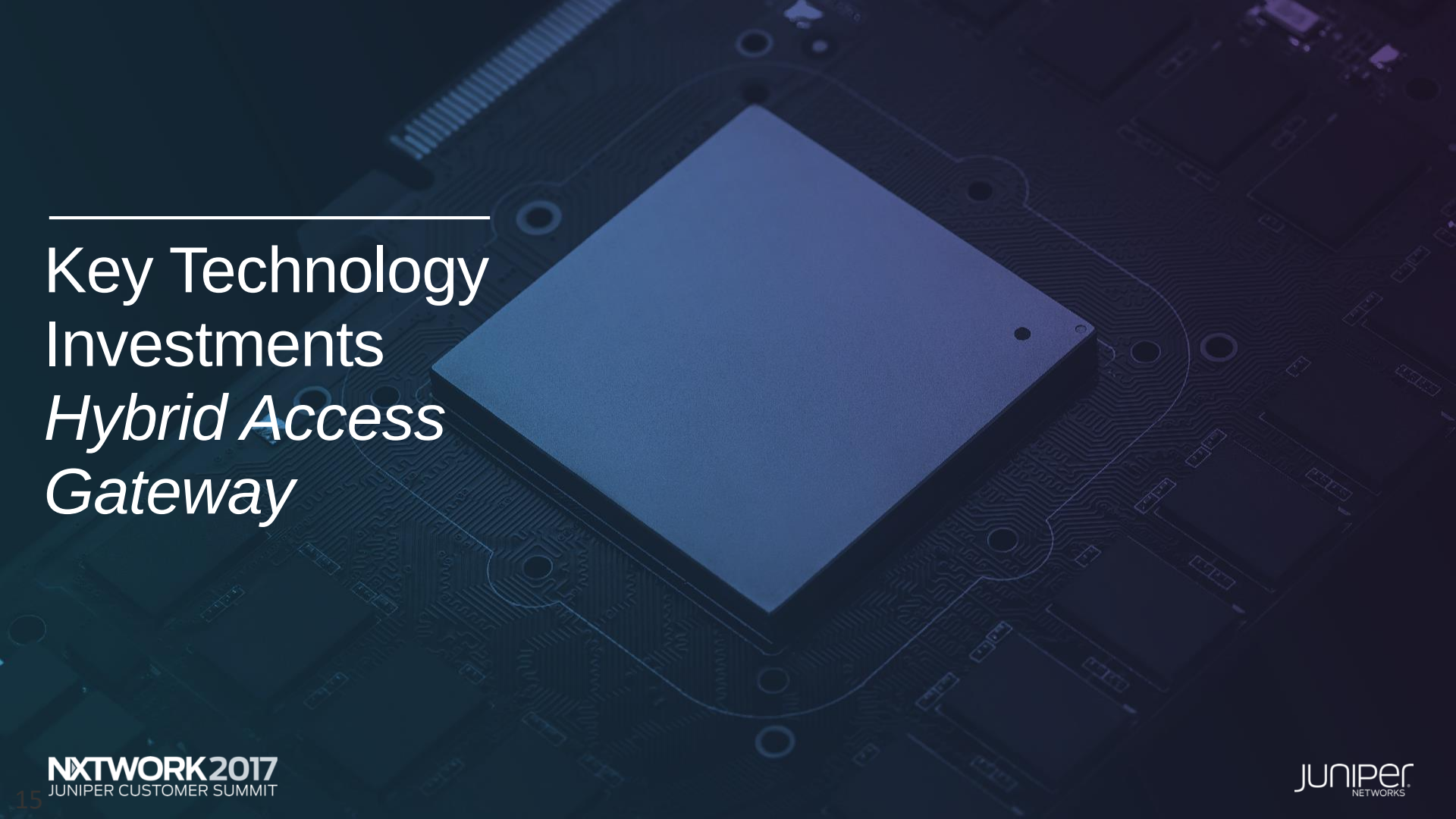
	Multi-Access	Multi-Services	Scale Up/Out	Modular	Automated
2017	Node Slicing External CP Packet Trigger PCRF/Gx/Gy	Node Slicing vBNG Contrail Cloud	NxBBE node slicing vBNG MX204 / MX10003 MPC 7/8/9 NFX	Sub-aware DPI vBNG (CP HA) vServices (CGNAT, SFW)	JFIT Netconf and YANG Junos Scripting
2018	HAG / vHAG Underlay (vxlan, EVPN) Mobile FP	NV + VC (N+M redundancy) vBNG (NxFP) E2 Controller JET	MX10003 VC vBNG (NxFP) Vale BNG Fusion	HAG NV + VC (N+M redundancy) vBNG (NxFP) Residential NERG Universal Services Framework – IPS, FW	E2 Controller Sub-based telemetry JET AFT





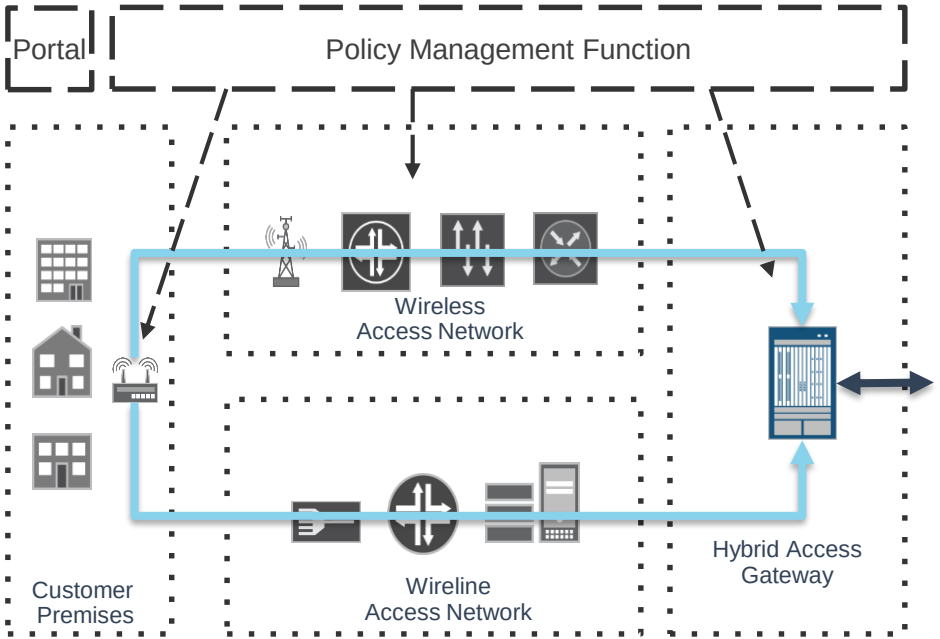


Key Technology Investments *Hybrid Access Gateway*



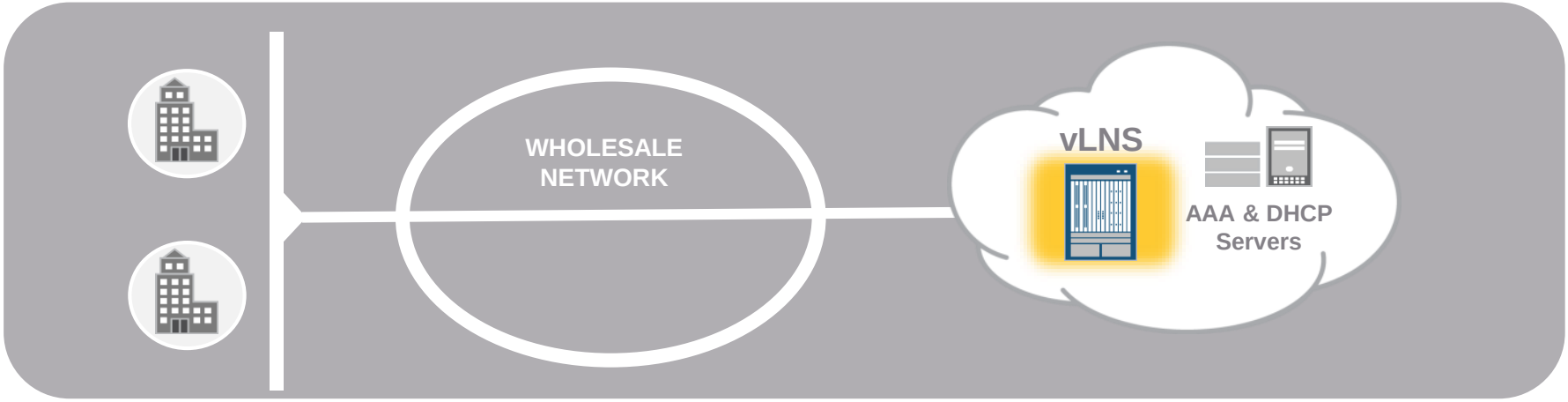
HAG STAND ALONE DEPLOYMENT

- Serve areas with poor DSL performance
- Last mile resiliency
- DSL provisioning requires more time
- Use data to identify demand areas for future expansion
- Wireless access is getting cheaper



Key Technology Investments *vBNG and vLNS*

VIRTUAL LNS USE CASE

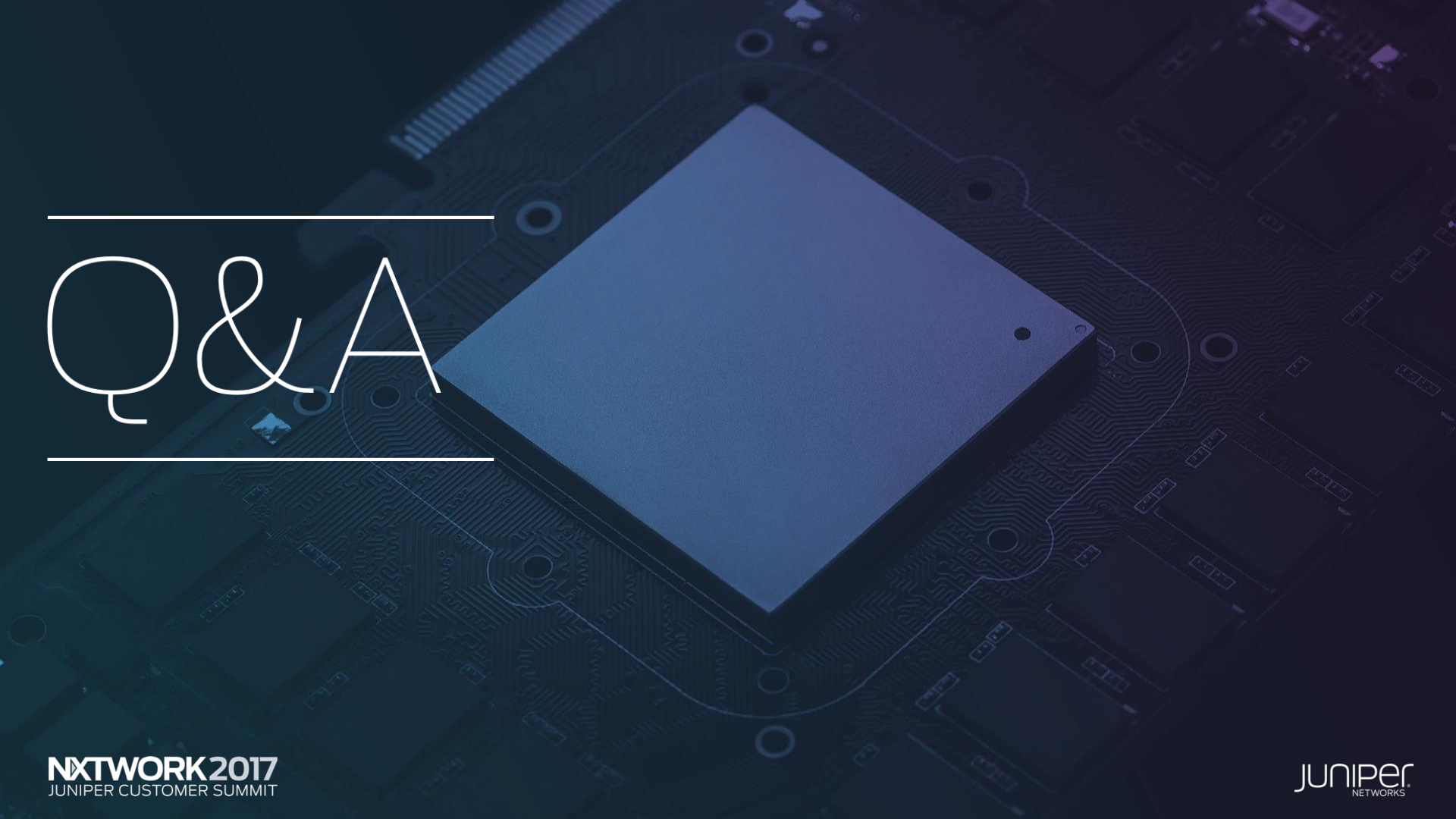


TIME

BUDGET

OPTIONS

SOLUTION


Q&A