

MPLS Japan 2021

改めて考えるDisaggregation/White Box の適用箇所と考慮すべき課題

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Juniper Networks

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Disaggregation: it's a complex discussion

Prime Motivation

CAPEX savings, Reduce vendor lock-in, Drive openness,
Simplify Operations, Improve Agility

Network Use Case

- ToR Switch
- Core/Edge Router
- OLT
- BNG
- CSR

Type of *Disaggregation*

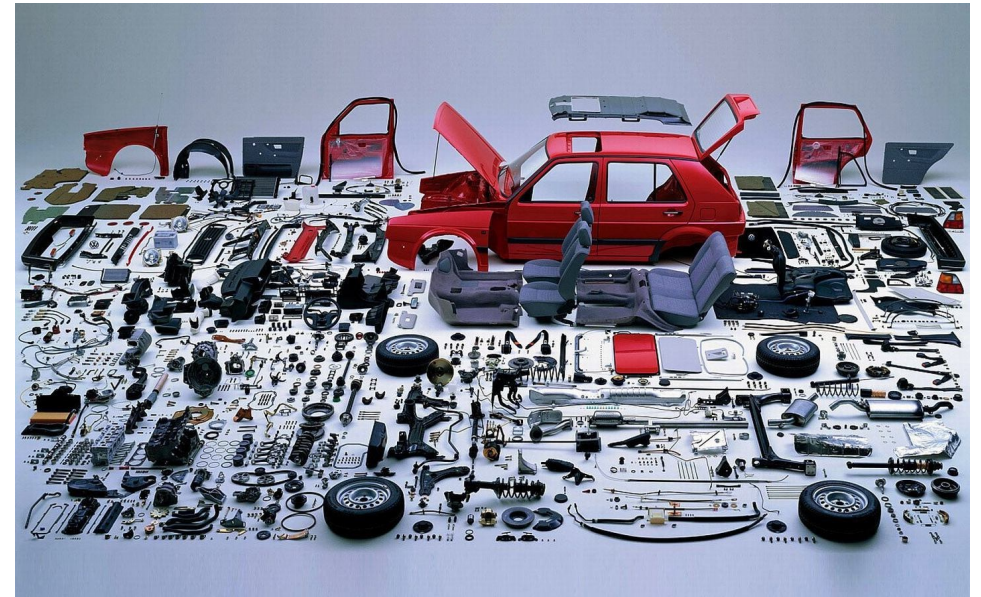
Decouple Hardware/Software
Virtualize a Network Function (VNF)
Scale Control/Forwarding separately
Leverage Cloud-Native Agility

Deployment Timing

Today vs. Near-Future
vs. Long-Term (>24M)

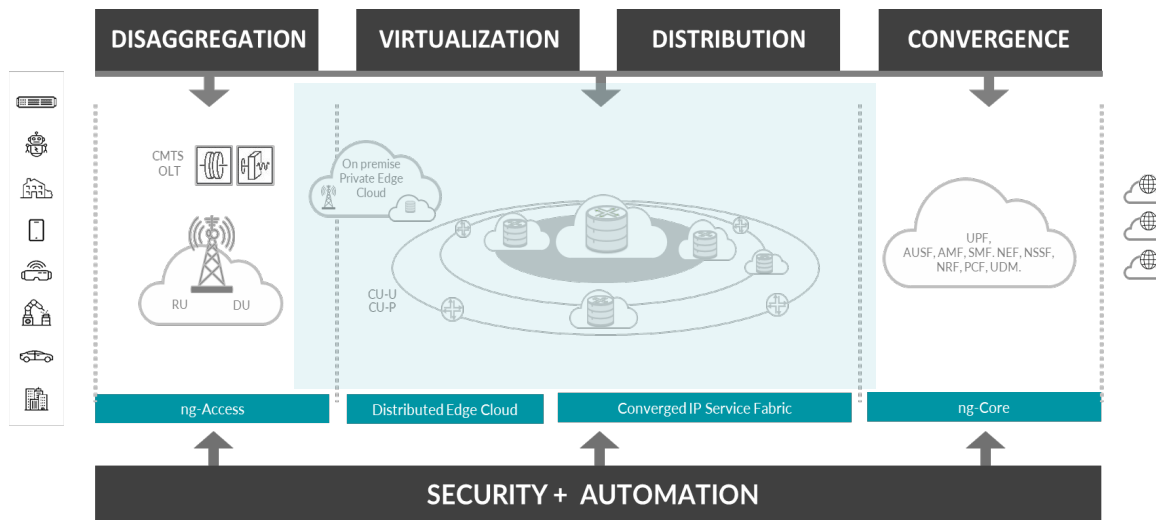


Would you build your own car out of random parts?

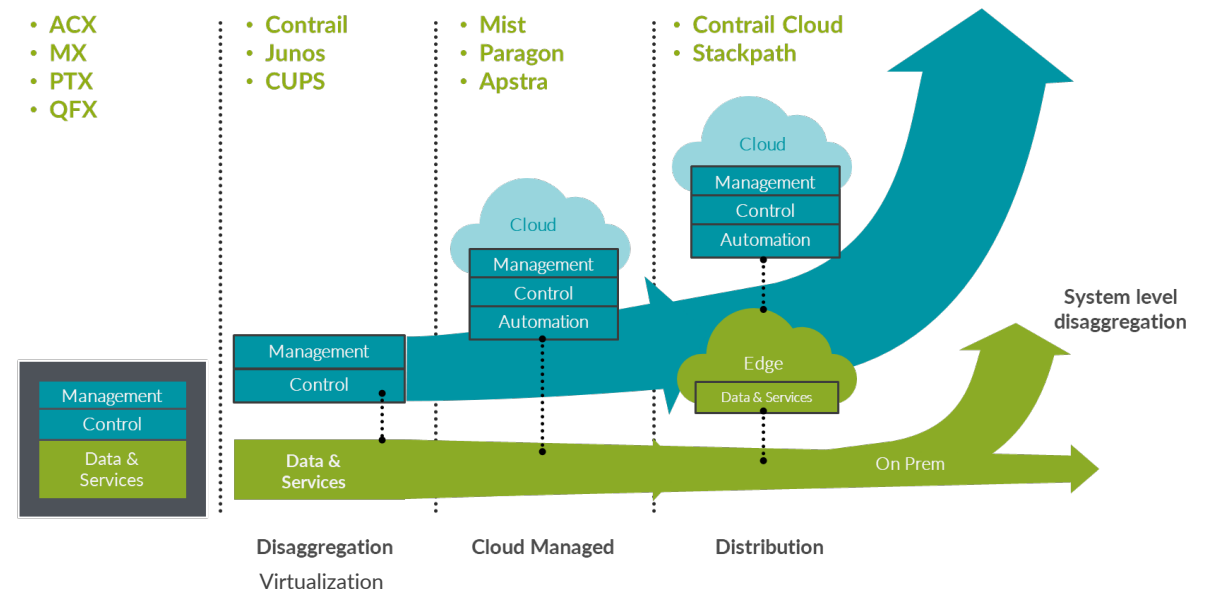


Juniper supports disaggregation, enabling your network evolution for the Cloud + 5G + AI era

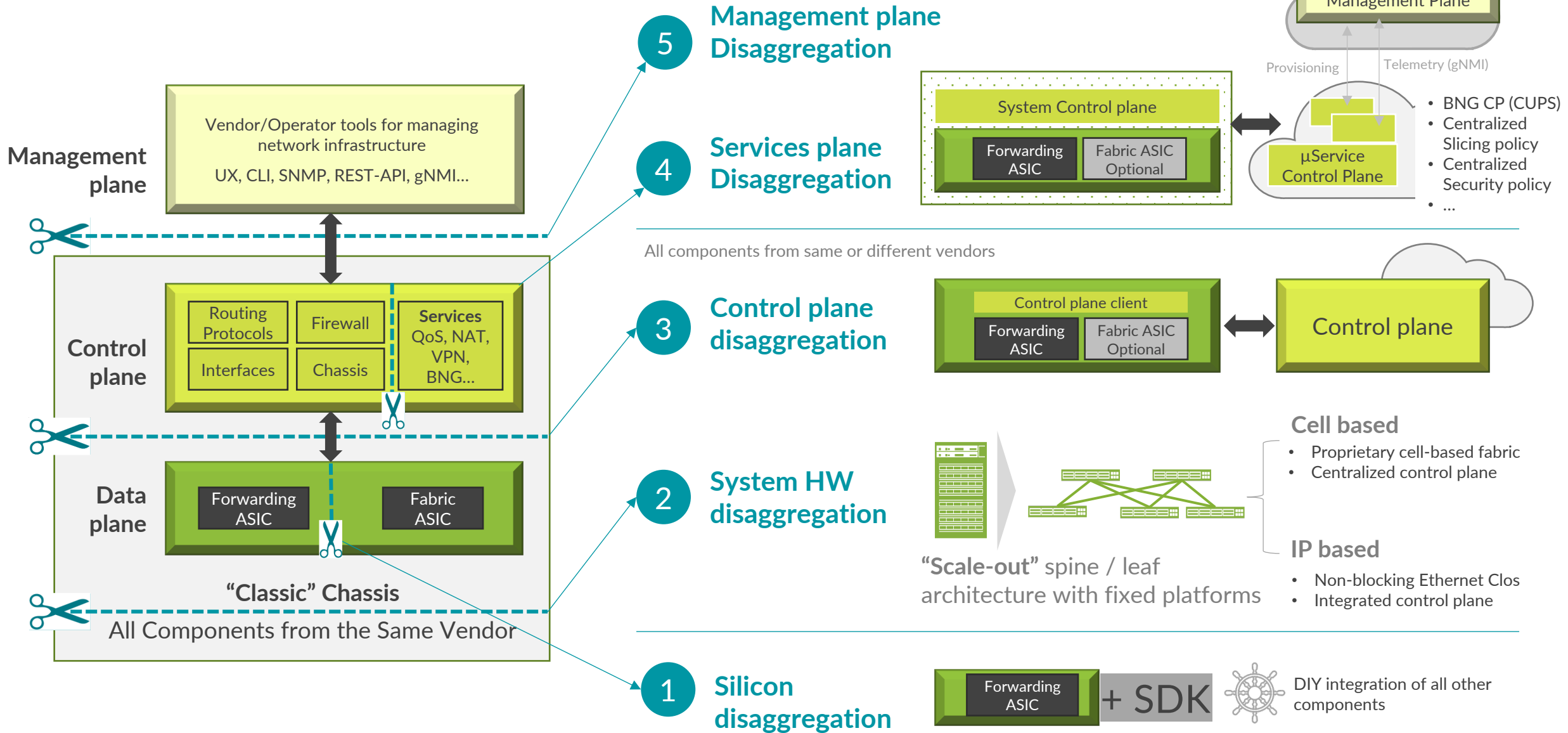
- Disaggregation is **one of the steps** towards profitably serving the scale + service demands of the Cloud + 5G + AI era
- It is happening in **all network domains**, at multiple levels
- Disaggregation **must be approached holistically** with equal need for openness, security and automation



- Juniper has a **history of leading** major technology shifts, including disaggregation in the networking domain
- Our portfolio already demonstrates these transformations, where they **create most value** for our customers (across segments)
- We are driving the **next level of system disaggregation**

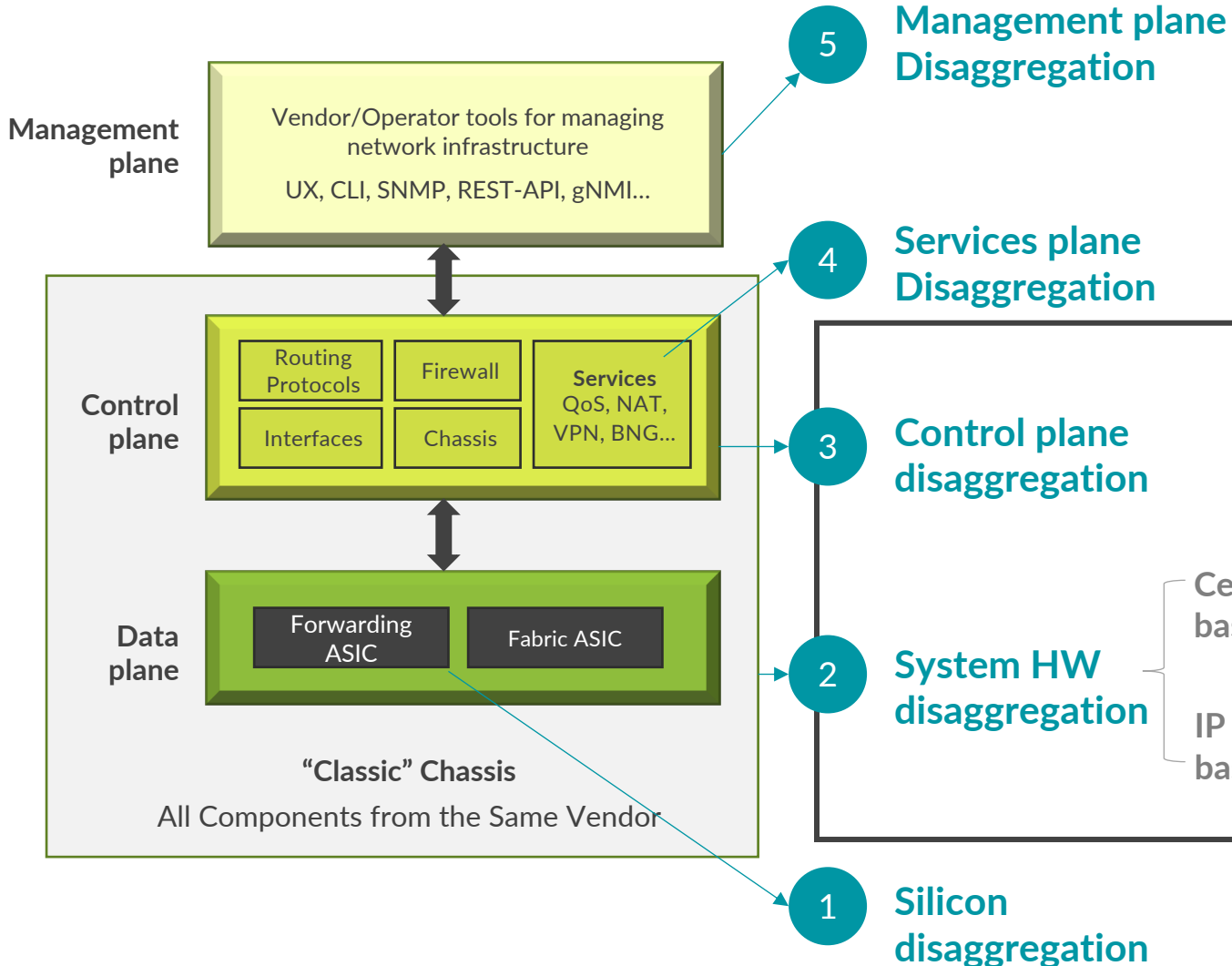


Routing Disaggregation is possible at various levels



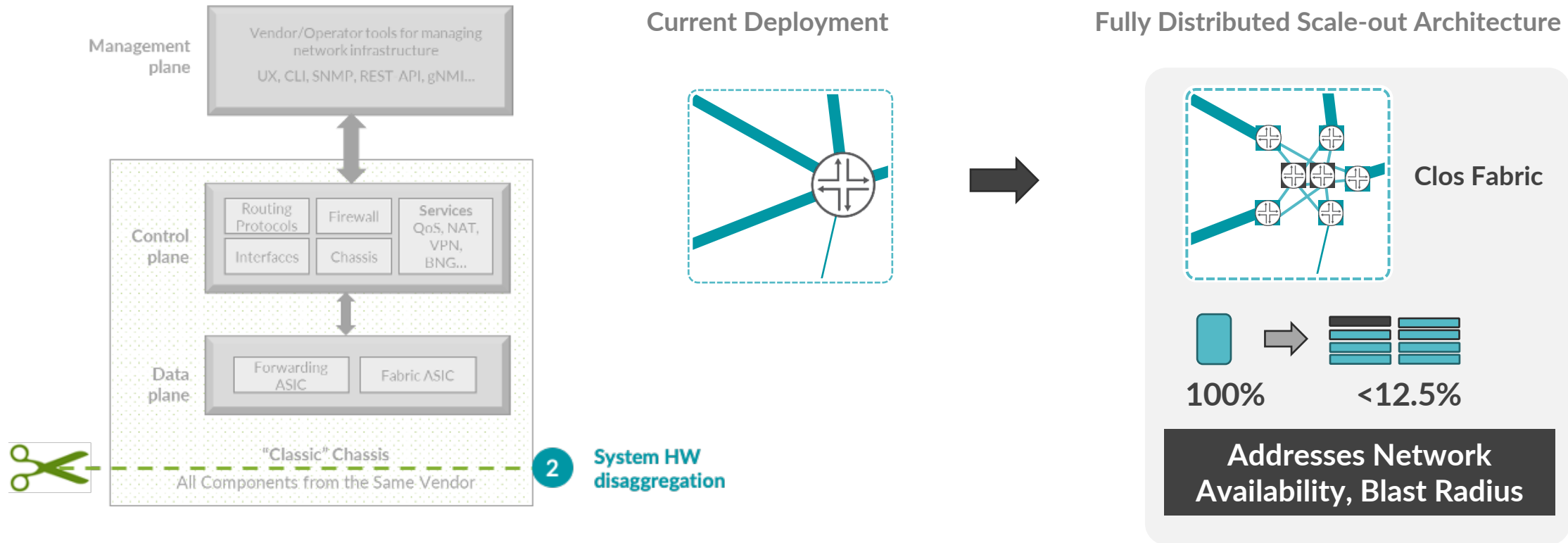
Some ecosystem examples

Current industry conversation on 2 and 3

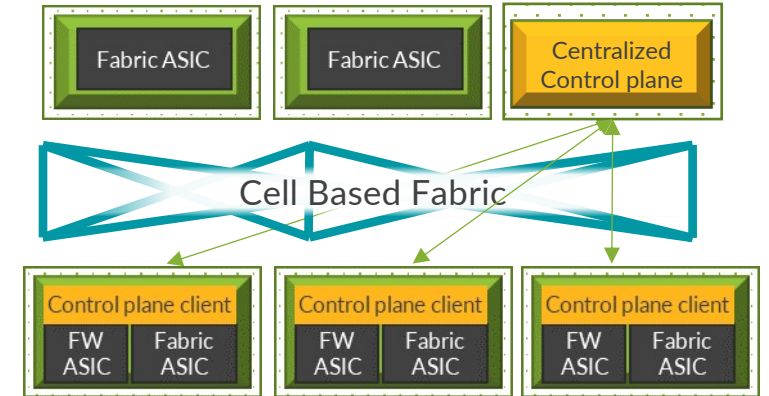
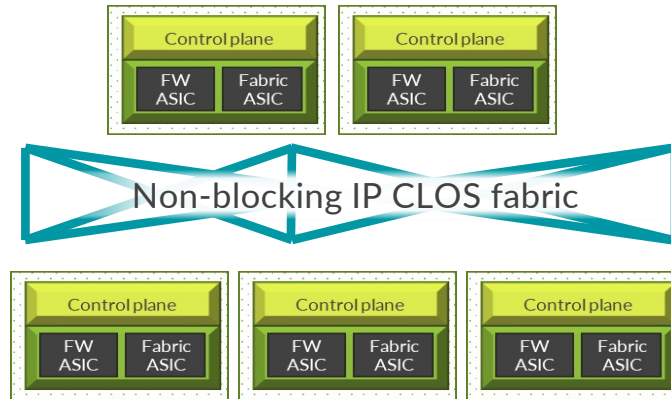
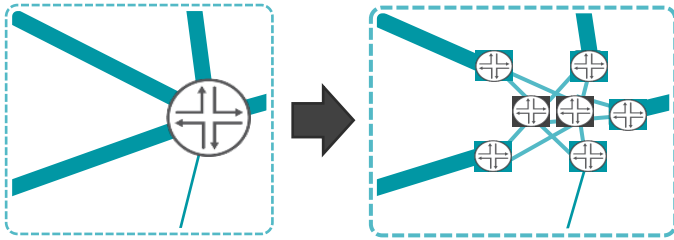


Customer Scenario	Juniper Examples
Move to Public/ Pvt Cloud hosted Management plane already happening	<ul style="list-style-type: none"> Mist Paragon Apstra
Multiple Open Industry initiatives, likely SP adoption with 5G	<ul style="list-style-type: none"> BNG CUPS Security Director Slicing Policy
Already deployed in Cloud Providers, SPs evaluating	<ul style="list-style-type: none"> Junos/EVO cRPD SONIC P4
Only limited deployment in SP Core. Few other Tier1 SPs evaluating	Not focus on this model
Cloud Providers + SP, Preferred by most of major cloud operators	Juniper IP fabric for Scale out including Custom/ WB options
Mostly driven by web-scalers with own R&D for SDK integration	Not focus on this model

System level HW Disaggregation (“Scale-out”) can be achieved in multiple ways



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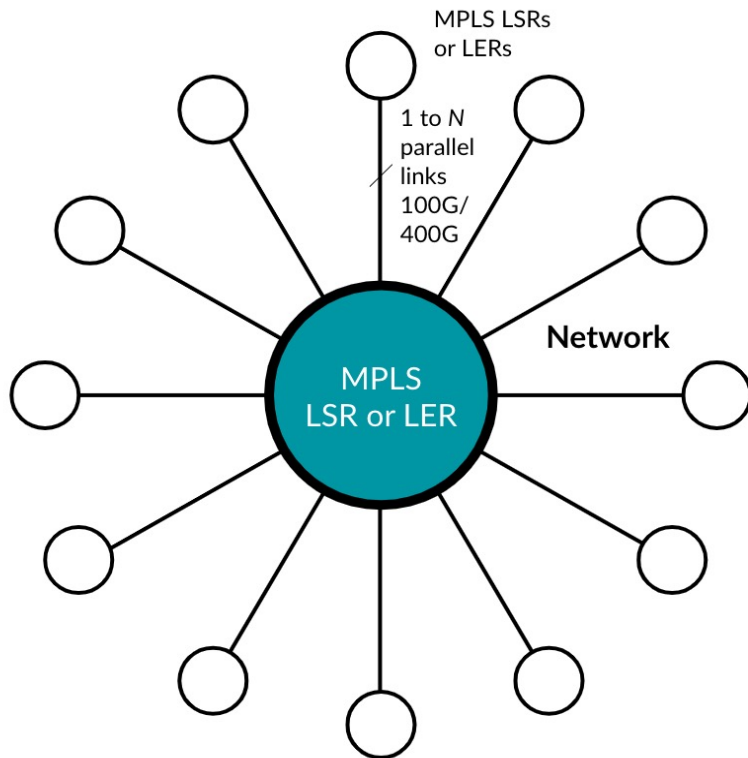
Open IP based disaggregation

Proprietary Cell based disaggregation

Non-blocking design	Yes	Yes
Open	Yes, IP/BGP connectivity, Mix-match any IP routing platform from any vendor in same fabric	No, Proprietary cell-based fabric no interoperability between vendors today
Small-scale / Remote use-cases	Yes, No Limitation on Leaf <-> Spine distances, Can be physically distributed (remote)	No, Leaf <-> Spine distance is limited, not suited for small-scale deployments/remote office
MTBF/Reliability, Upgrades	High, Minimum controller dependency	Low, Need for Out-of-band management increases MTBF, CP upgrade will cause downtime
Simple Provisioning & Automation	No, Requires IP addressing for all Leaf/Spines, Additional tunnels required for full mesh	Yes, Single IP address similar to Scale-up models

Disaggregating single chassis into N x M leaf-spine nodes solves some problems, yet introduces new problems which require further innovation

SCALE-UP - SINGLE NODE



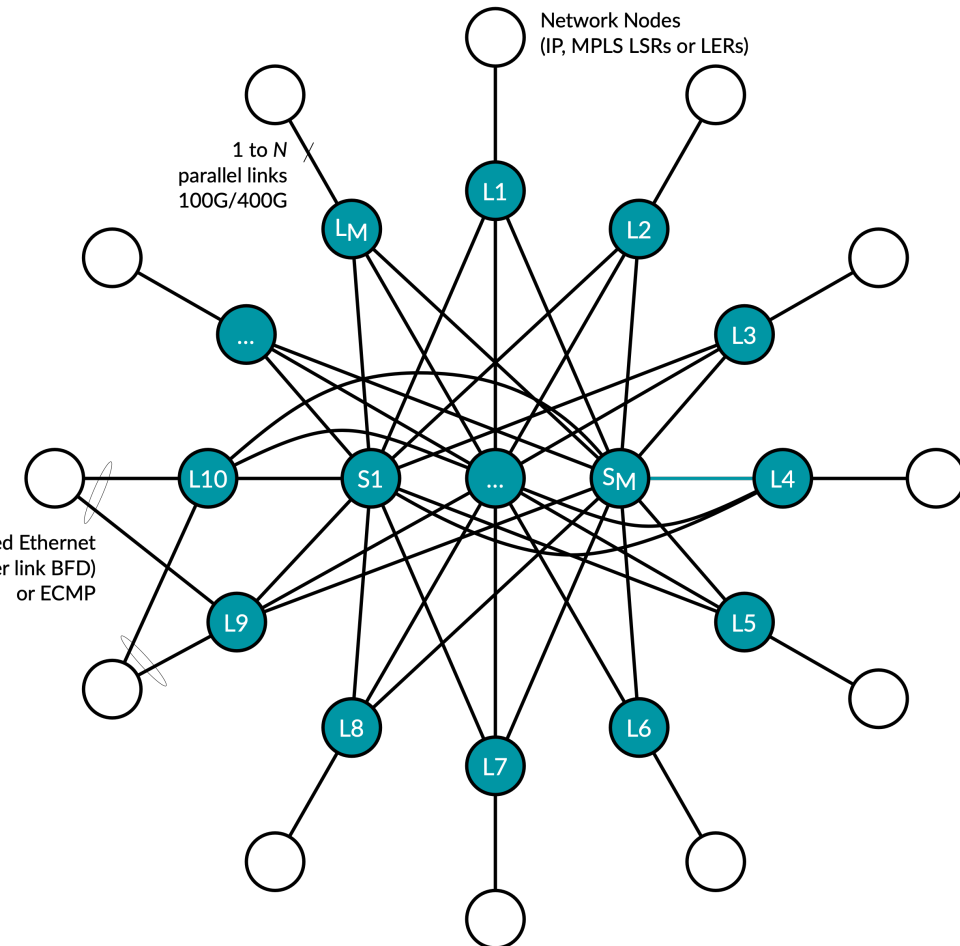
SCALE-OUT - 100s of NODES

Problems addressed

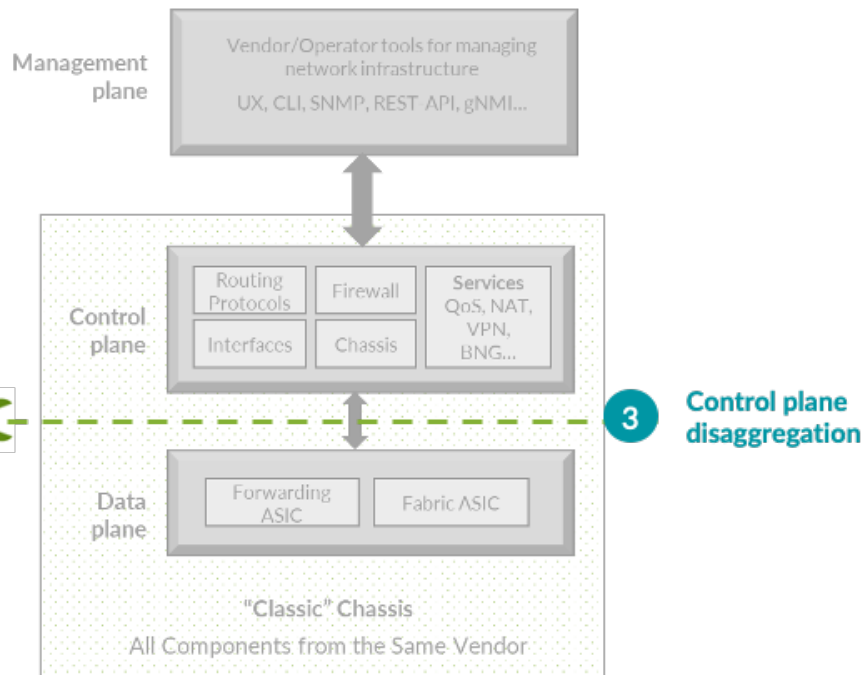
- Reduce Blast Radius
- Scale beyond chassis

Problems Introduced

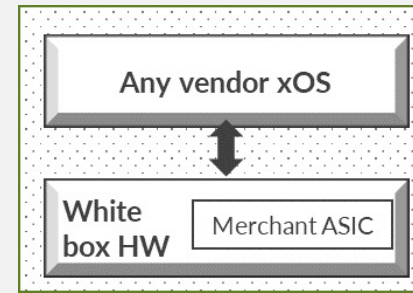
1. Fabric Setup and abstraction required (perceived as a single super-node)
2. New ways of Control Plane Scaling required
3. Automation required to manage & monitor huge number of nodes



Control plane disaggregation => Juniper leading the way with Junos. Supports all options including Merchant and White-box

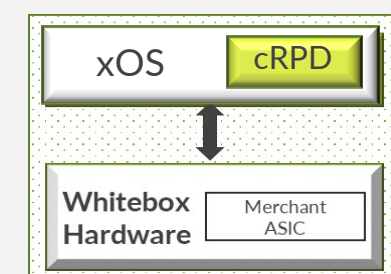
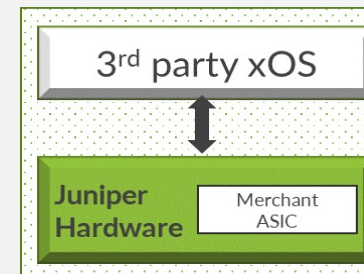
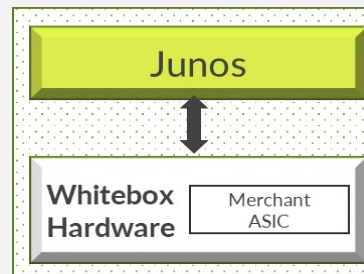


Integrated and managed BY CUSTOMER



Customer DIY approach:

- Up-front investment in SI, Provisioning
- OpEx: Complex supply chain; testing & validation against new features; OS porting to new WB variants
- Limited Automation for Debugging, RCA



What does disaggregation mean to you? What are your drivers & efforts?

Which level of disaggregation are you interested in?

1. Management plane
2. Services plane
3. System SW (Control plane), incl White box
4. System HW (Scale-out)
5. Silicon
6. Multiple Combinations

What are your primary drivers and expected outcomes?

1. Reduce TCO
2. Eliminate vendor lock-in, best-of-breed / supplier diversity
3. Top-down Merchant mandate
4. Align to Open architectures
5. Address network availability / Blast Radius
6. Other

What is the current status of your disaggregation efforts?

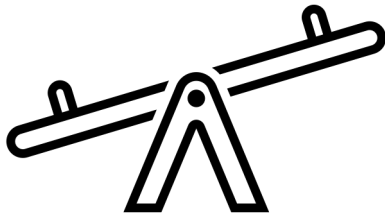
1. Which WAN domains do you envision first?
2. Current ecosystem engagements – vendors, open initiatives?
3. Status of trials/PoCs? Readiness for production environments?

There are known **and unknown** implications of disaggregation

Evaluate every solution holistically, not just on costs

Expected/Known trade-offs

- Perceived lower costs
 - Higher availability
 - Supplier diversity
- vs
- Certification, Validation
 - Complex System Integration
 - Multi-Vendor management
 - Logistics, Supply Chain
 - Higher time, effort, risk



What are the trade-offs you are willing to make?

What are the risks you are willing to take?

Unexpected/Unknown costs/implications



Maintenance & Customer Support, Hidden elements.



Automation Tools customization, Debugging, RCA, Remediation



Complicated lifecycle management across multiple components (security implications, innovation roadmaps, spares costs...)



Need for greater expertise, re-skilling your own teams / operational processes



Longevity / Maturity of solutions and vendors, Ability to execute

Summary

- Identify the prime drivers and expected outcomes
- Plan the right level of disaggregation approach to align the goals
- Beware unexpected/unknown costs/implications
- Juniper offers the **broadest range of open disaggregation solutions** – including System level HW disaggregation, Control plane, Services plane and Management plane disaggregation
- Juniper's disaggregation solutions **address all key drivers** including TCO, Network Availability, no vendor lock-in and adherence to Open Architectures



Thank you

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