The Self-Driving Network
From vision to execution

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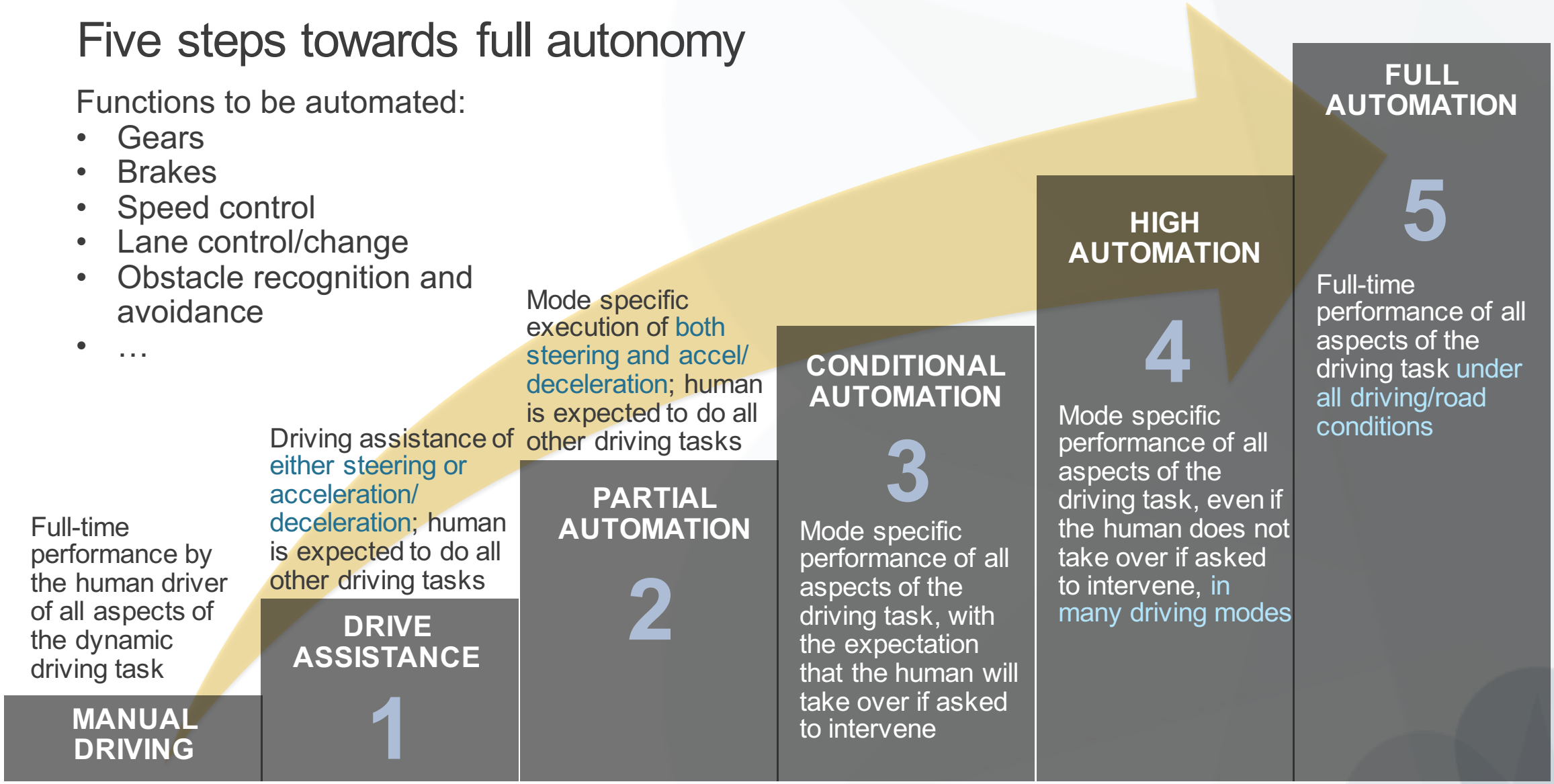
Self-Driving Cars

Five steps towards full autonomy

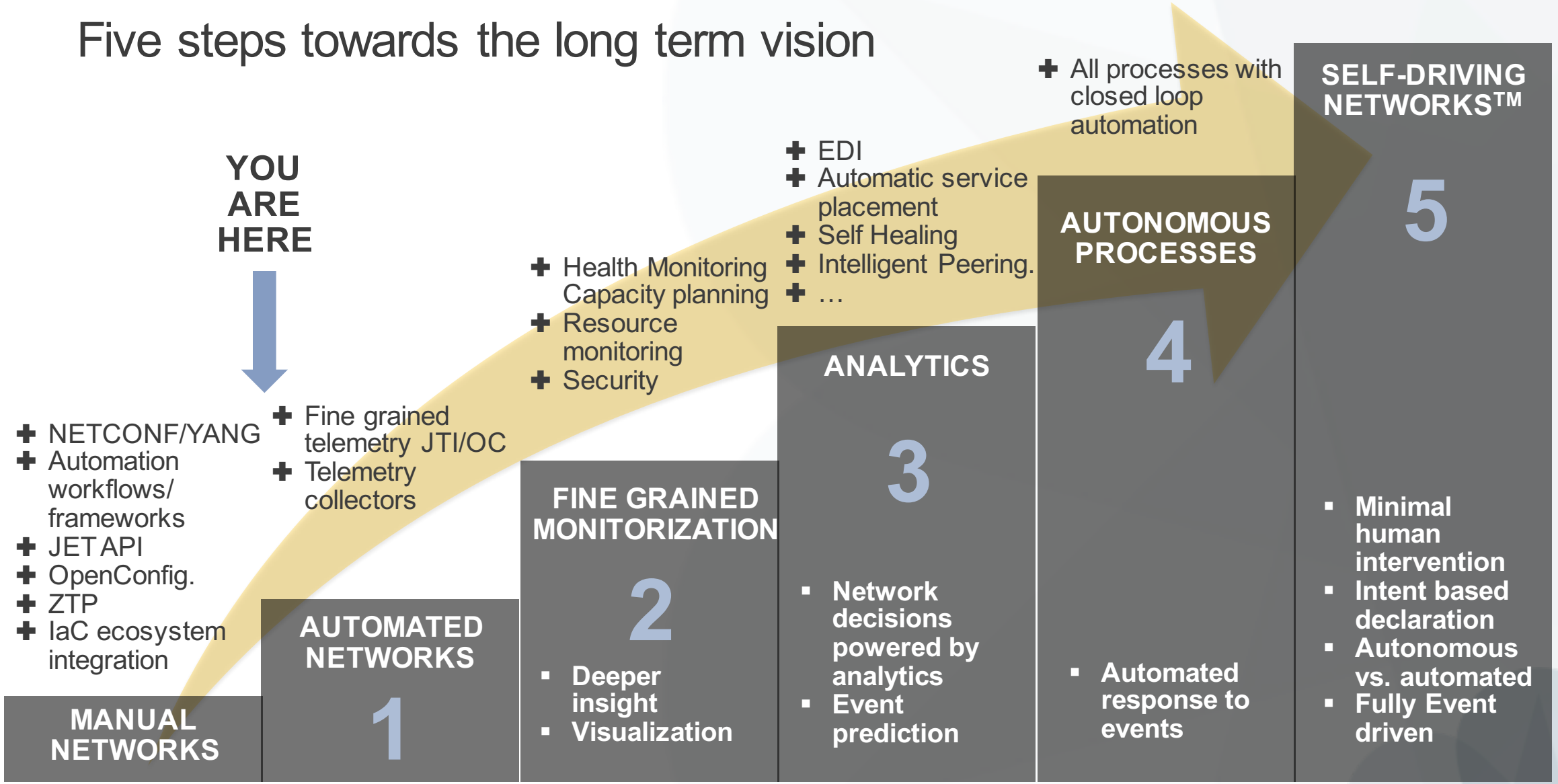
Functions to be automated:

- Gears
- Brakes
- Speed control
- Lane control/change
- Obstacle recognition and avoidance
- …



The Self-Driving Network™

Five steps towards the long term vision



Intent – Declarative: Say what you want, not how

✓ Intent is non-specific
unnecessary details avoided

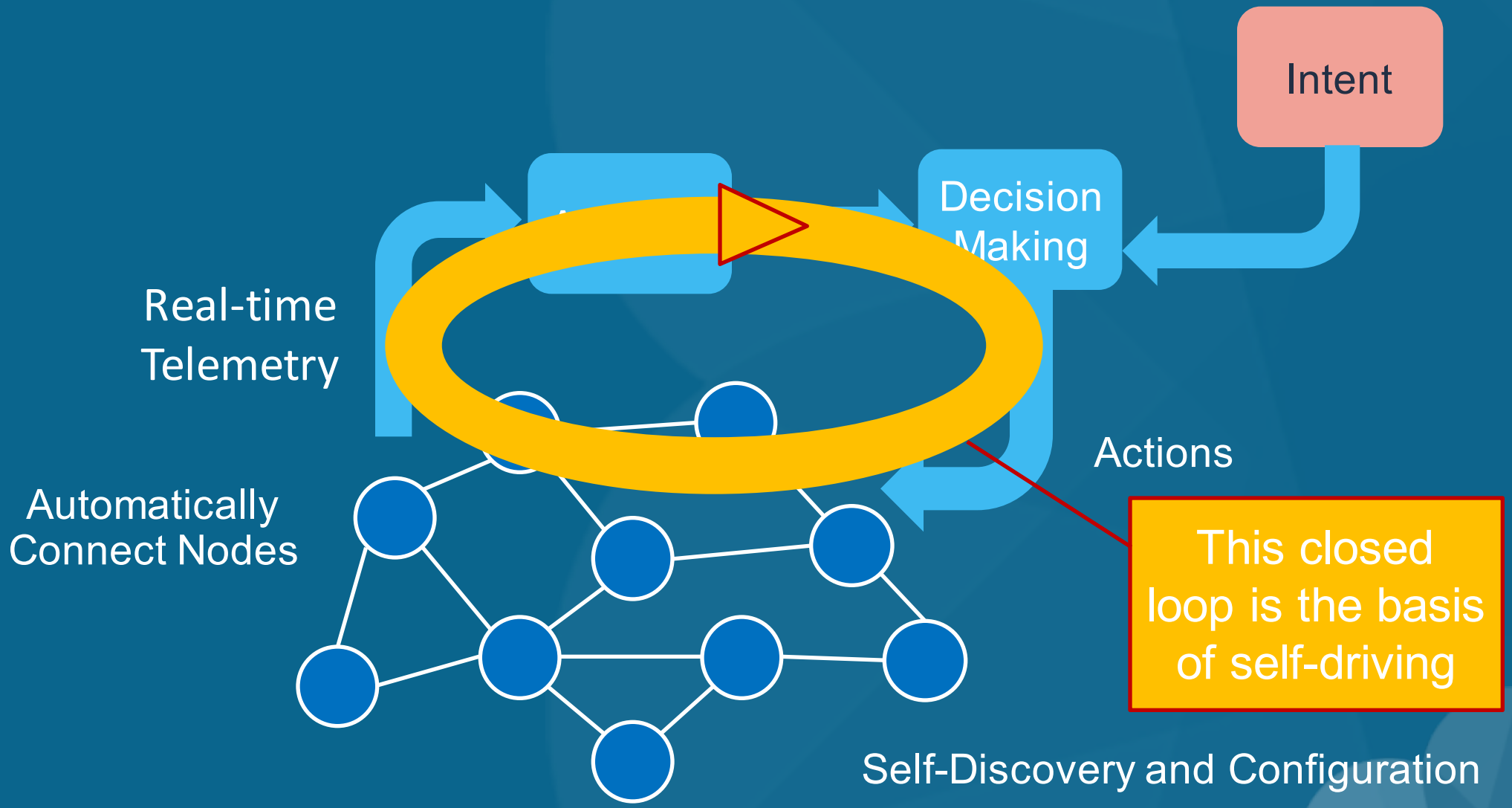
✓ Intent is stable
immune to network changes

✓ Intent provides context
user service more meaningful

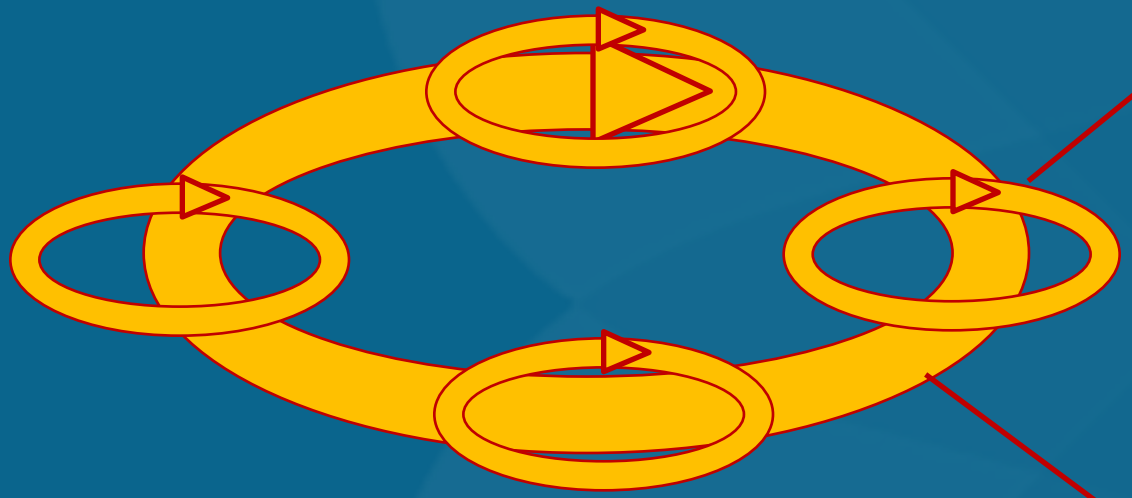
The Self-Driving Network implementation
Processes that require self-driving

Design	Test	Plan	Build	Operate
Technology selection	Functional test	WAN capacity planning	Physical network deployment	Service placement
Topology	Performance test	Service capacity planning	Initial configuration deployment	Service provisioning
Protocol design	Software validation	Licensing planning		Service assurance
Services design	Interoperability test	Facilities planning		Network KPI monitoring
Config templates mgmt	Lab setup			Network diagnostics
	Test plan mgmt			Problem remediation
				Configuration management
				Software management

Architecture of the Self-Driving Network



Implementing the Self-Driving Network



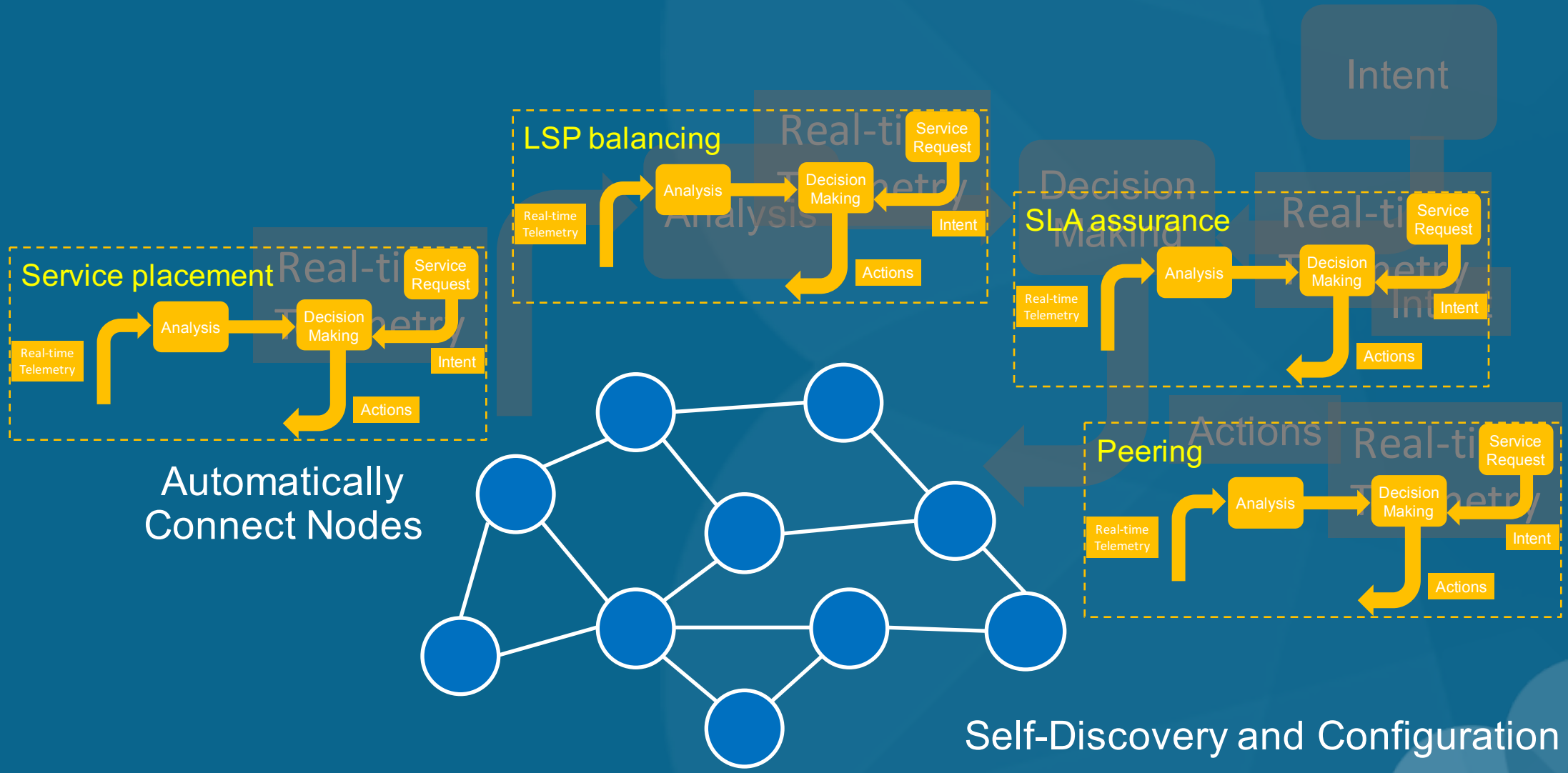
Each of these mini-loops is called a robot

This loop is implemented as a set of more basic loops

A robot may fully or partially complete the loop

- Self-Driving
- Autonomous process
- Analytics
- Motorization

Roboticized Functions in the Self-Driving Network



FIRST ROBOT: SERVICE PLACEMENT

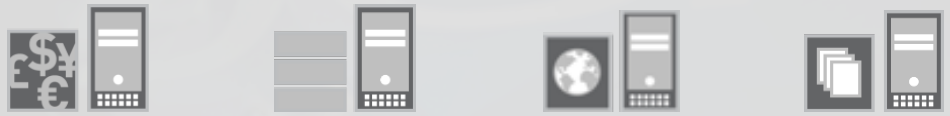
which device should offer a given service?

1. Specify Service Intent — Don't worry about where it will be
2. Where best to place the service? — Let the controller work this out
3. Things change: is placement still optimal? — Streaming real-time data
4. Service Motion: move service to a new location — Update service in real-time

Break the mold! Update service placement often, to keep it optimal

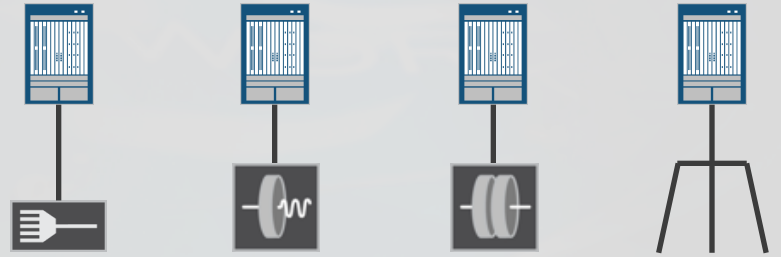
ANALOGY: Compute Orchestration vs Service Orchestration

OLD: Same (or very similar) servers
running **dedicated** apps



Finance DB Web Apps

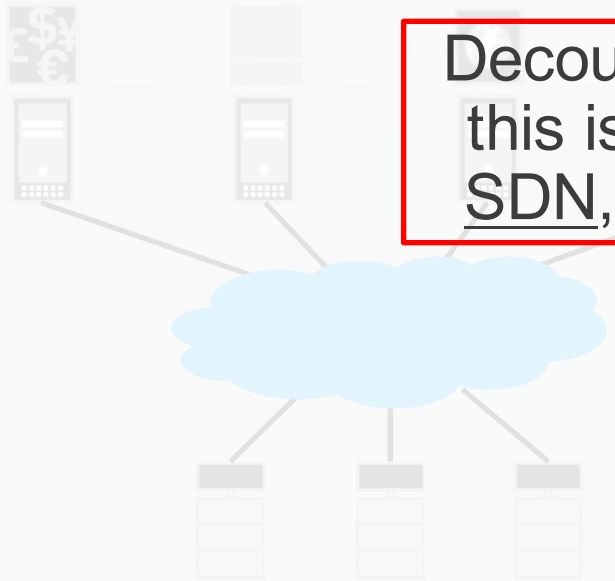
OLD: Same (or very similar) routers
running **dedicated** services



BNG CMTS BizPE Peering

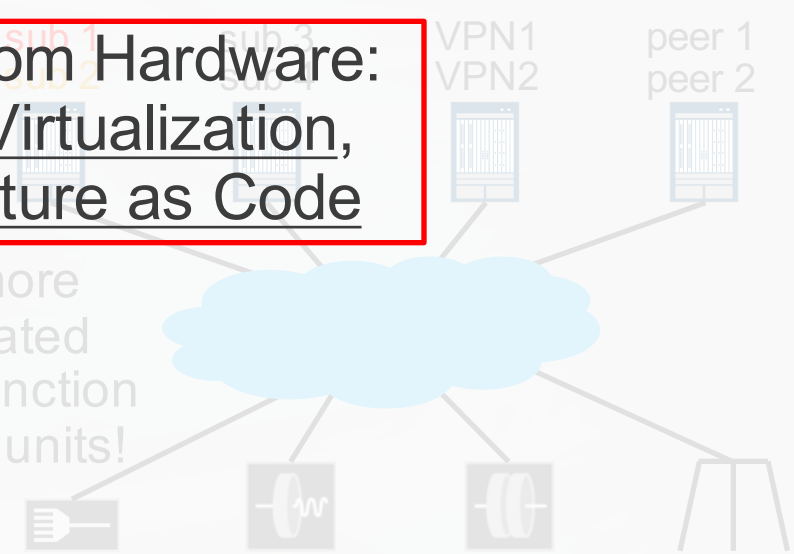
ANALOGY: Compute Orchestration vs Service Orchestration

NEW: Apps decoupled from servers;
storage available to all servers;
servers are now identical



No more
dedicated
single function
servers!

NEW: Services are decoupled from routers;
access devices available to all routers;
routers are now identical

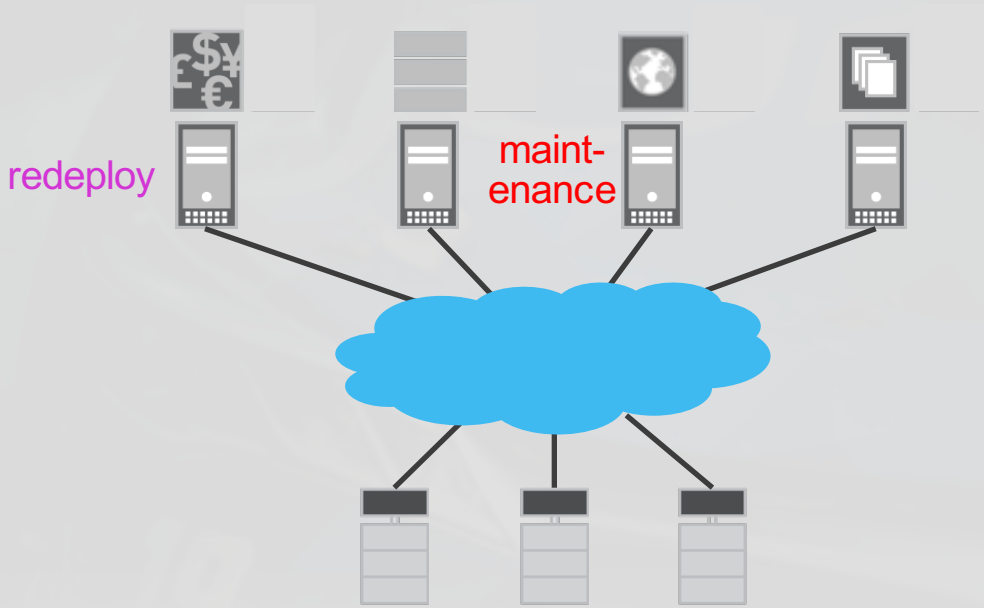


No more
dedicated
single function
service units!

Decoupling Apps/Services from Hardware:
this is the True Meaning of Virtualization,
SDN, NFV, Agility, Infrastructure as Code

ANALOGY: Compute Orchestration vs Service Orchestration

NOW POSSIBLE: "vMotion" of individual apps across servers; app placement is now a thing



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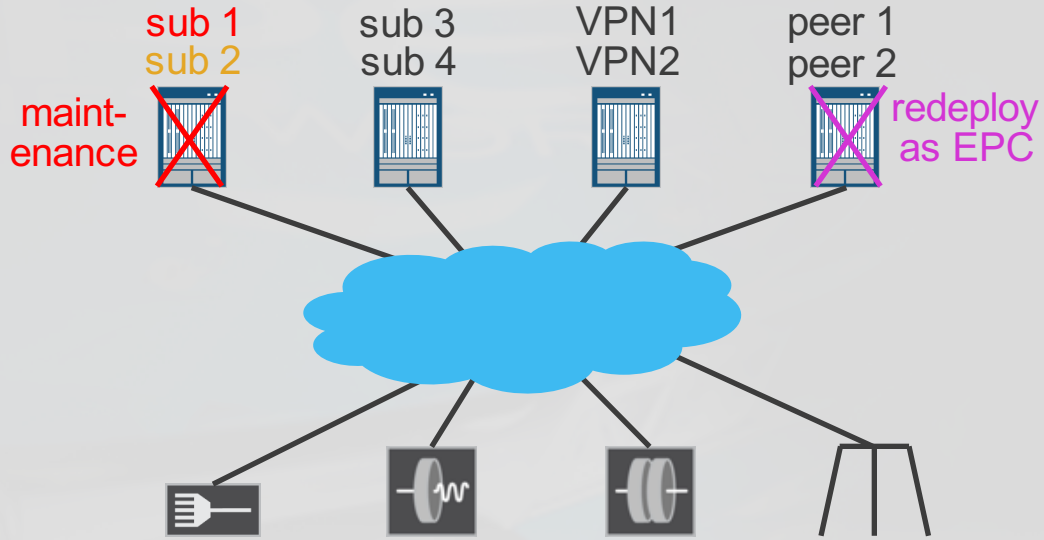


Peer Bot

Simplifying Peering Across Internet Exchange

Business Goals

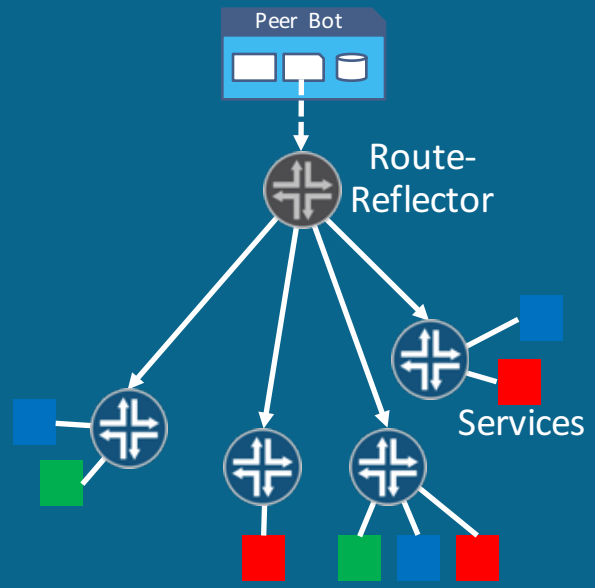
- Optimize Peering costs and application experience

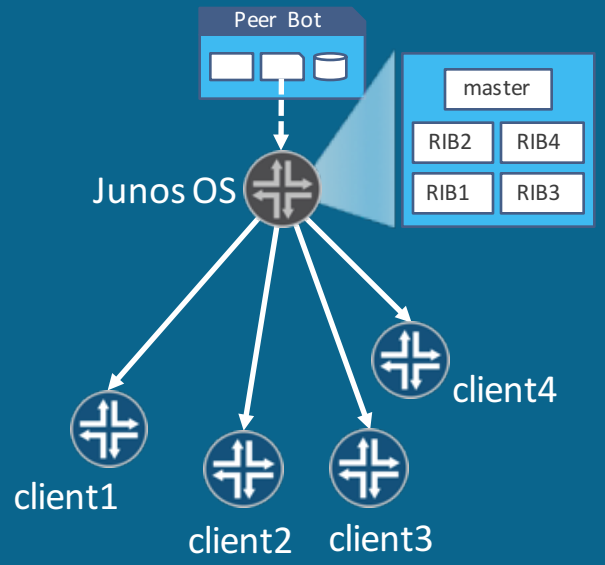
Customer Requirements

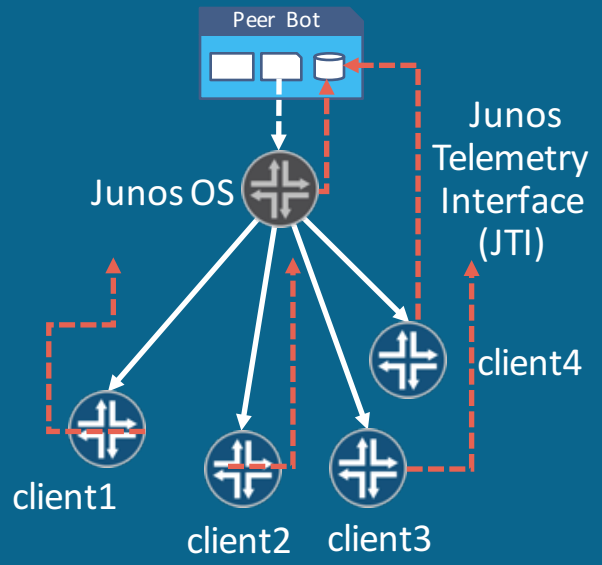
- Seamless Internet Exchange Peering Experience
- On-Demand Scaling and Interconnection
- Support Self-Care Portal
- Design, Build and Operate World-class Networks

Peer Robot Benefits

- Seamless Add, Modify, and Remove Peering Points
- Dynamically Establish Peering Policy
- Simplify Network Operations by as much as 800%
  - Adding a new peer 8x faster than via CLI
  - Eliminate complex policy enforcement factorially (N!)
  - View the number of peering routes and bandwidth in real-time

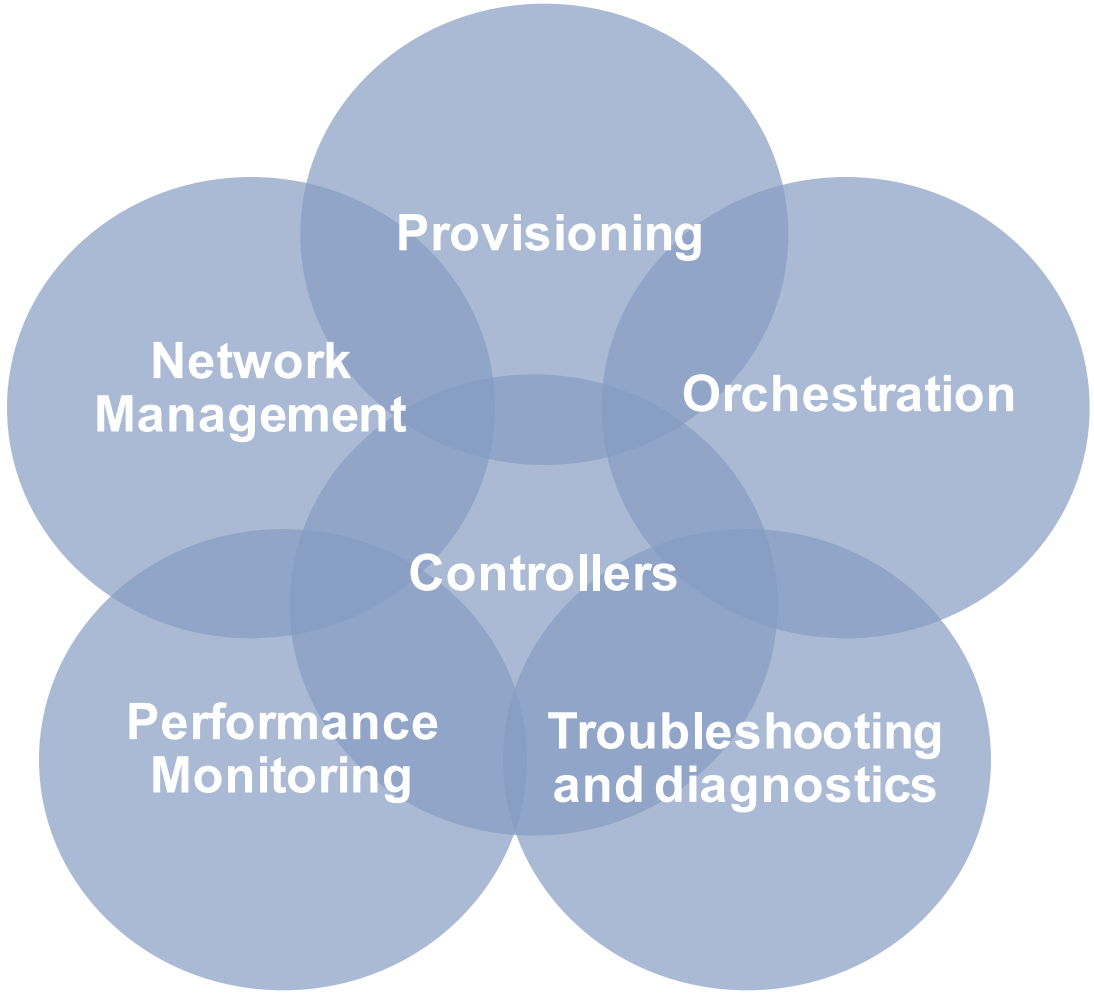






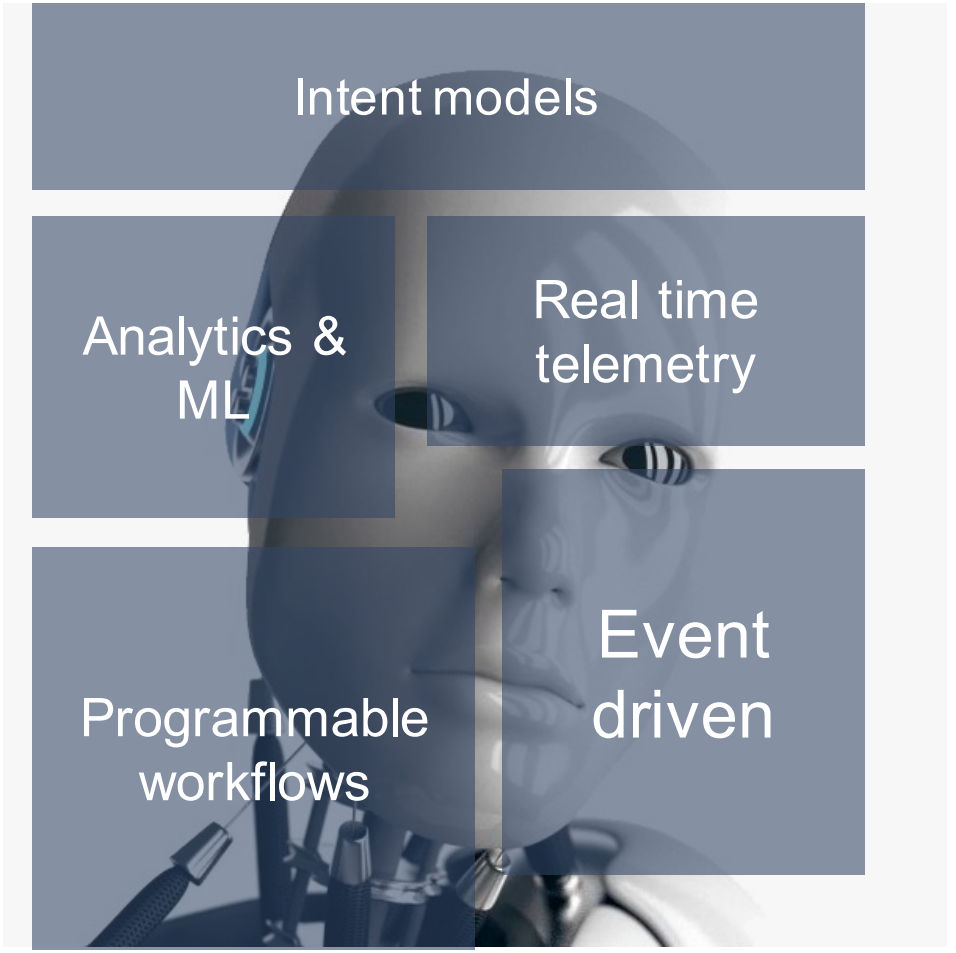
Blurring frontiers…in the Self-Driving Network

Today´s network and service management tools



From network management applications …

Key new attributes



… into Network Robots

Conclusion

A Self-Driving Network may seem a hard (nearly impossible!) task

1. Specify requirements declaratively as intent
2. Divide and conquer – break it down to manageable pieces

Roboticizing a function enables new capabilities

- Automating service placement gives you “S-Motion”

Roboticizing peering dramatically reduces complexity

- The peer robot makes peering dynamic and responsive

Thank you

Visit our booth to see the peer robot demo!