

Closed Loop Platform Automation w/ OPNFV

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Objectives

- Introduce Closed Loop Platform Automation (CLPA) & relevant use cases
- Integrate OPNFV projects to deploy CLPA use cases

Multiple Closed Loops

Offline Processing

Plan & Provision



Telemetry

Forecast

Offline
feedback loop

Optimize

Design

Analyze

Use cases (Loops)

- Capacity planning
- Peering planning
- Cache placement
- ...

Online Processing

Near-real
Time
Feedback loop

Control
Assure

Real-Time
Feedback loop

Telemetry

Use cases (Loops)

- Service assurance
- Security operations
- ...

Orchestrate

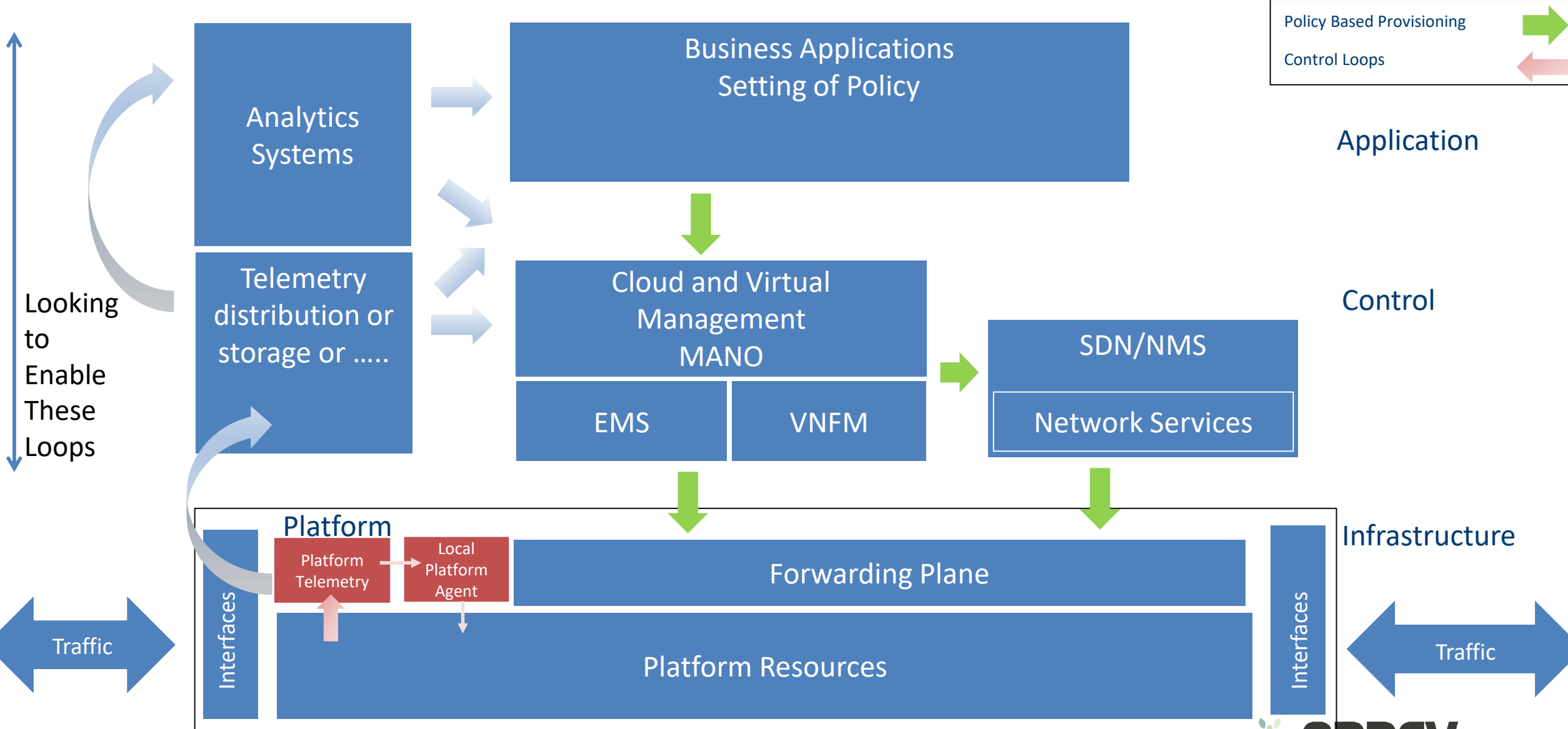
Telemetry

Monitor

Real-time/Near Real-time Loops - Automated



Networking Closed Loops – High Level Architecture



Independent Closed Loops: SDN, Cloud & Virtual Mgt, Platform



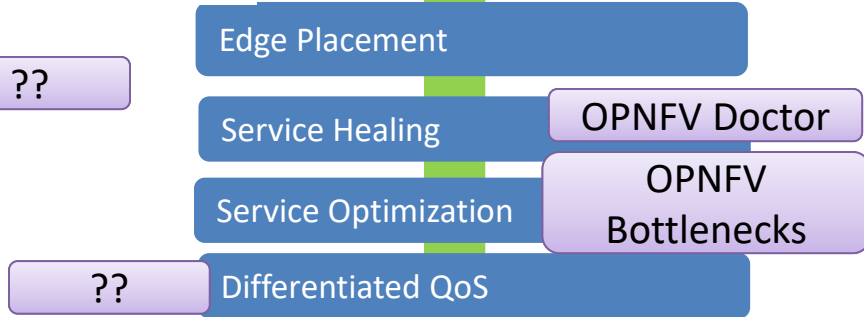
Closed Loops – Use Cases



Security



Improved Customer Experience



Cloud Optimization & Efficiency

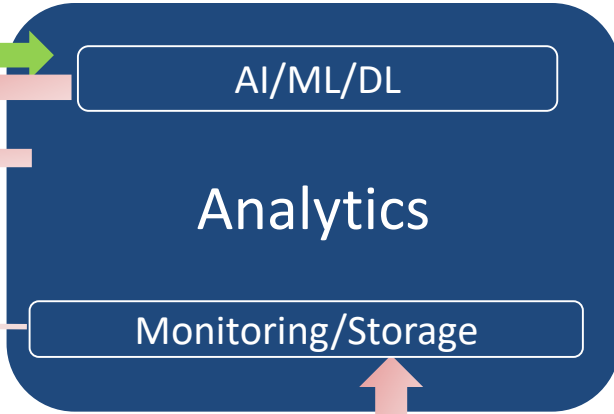


Business Use Cases

Business Applications

NFV Orchestrator (NFVO) [eg ONAP/OSM]

VNF Manager (VNFM)



OPNFV OVP

Actively Contributing



Collaborate to Integrate w/ OPNFV Projects

- Intercept – Existing or New?: Few projects already leverage parts of CLPA concepts
 - OPNFV Doctor -> self-healing & fault management using OpenStack Fenix ⁽¹⁾
 - OPNFV Bottleneck -> to implement AI over test data ⁽²⁾
 - OPNFV VSPERF -> to implement analytics over performance results
 - OPNFV NSB -> sample VNFs integration with platform metrics
 - OPNFV Barometer -> telemetry
- Unify the CLPA approach
 - Provide uniform approach to closed loop automation
 - Enable newer use cases leveraging advanced platform telemetry in energy efficiency, differentiated QoS, security, etc.

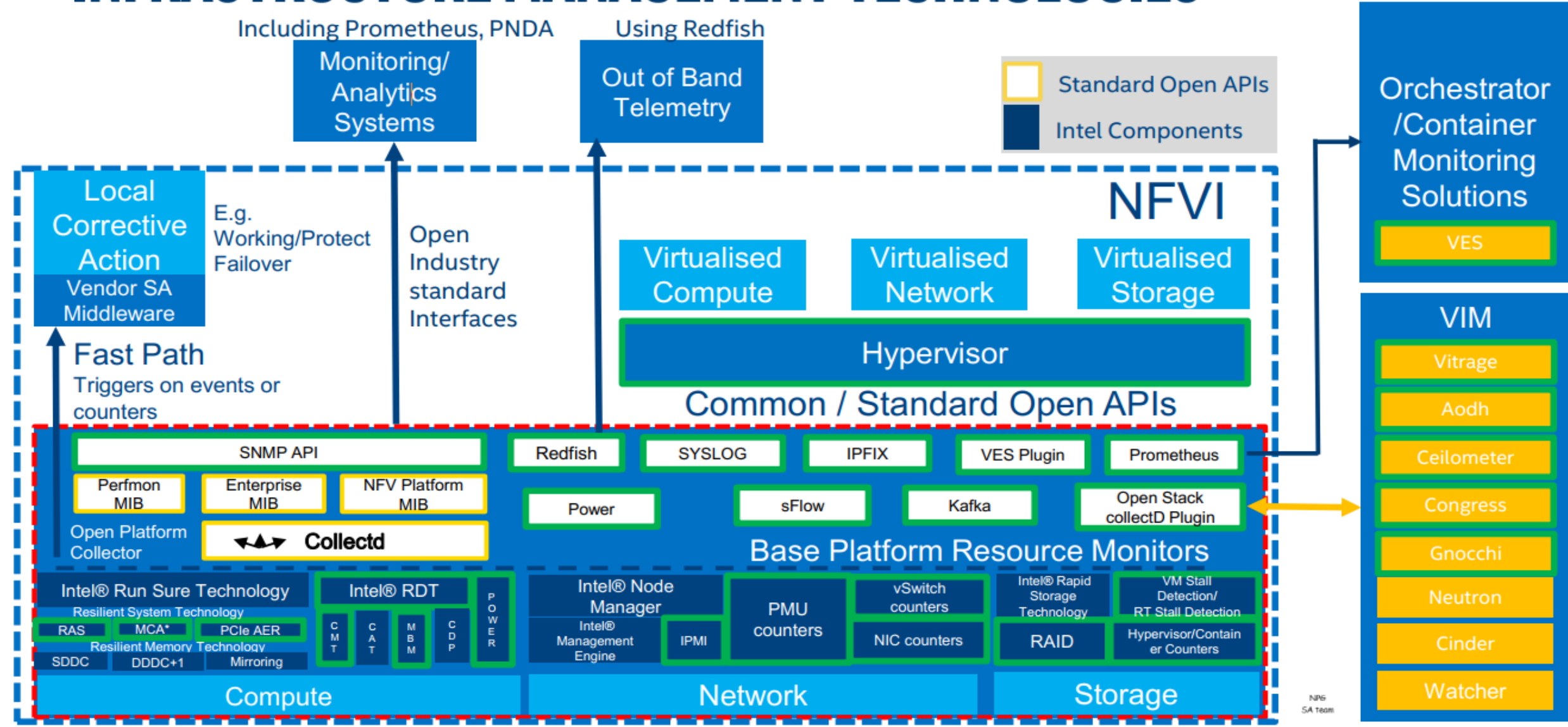
1. <https://wiki.opnfv.org/display/doctor/Doctor+Home>

2. <https://wiki.opnfv.org/display/DEV/Intern+Project%3A+Bottlenecks+AI+Applications+in+Testing+and+Results+Analysis>

Backup



INFRASTRUCTURE MANAGEMENT TECHNOLOGIES



Telemetry available through Collectd

Networking Closed Loop Groups

Real-time/Near Real-time Closed Loops

Threat Detection

Threat Response

Edge Placement
(Closer to the edge)

Service Optimization

Capacity Optimization

Energy optimization*

Service Healing

Differentiated QoS

Energy optimization*

End to End Assurance
Network Routing/
Security
[Routing]

Automation
Orchestration/
Placement/
Provisioning

Automation
Auto-scaling

Operations
Reliability

End to End Assurance
Performance
Management
[Equipment]

Management and Analytics

Telemetry

Actions



Platform

Intel Run Sure/RAS

Intel RDT

Power

Groups of Control Loops



Use Case List

1. Noisy Neighbor avoidance
2. Energy efficiency with improved IDLE power consumption, power management, etc.
3. Power aware workload placement
4. Reliability aware workload placement
5. Reliability aware auto-scaling
6. And so on...