The role of MDA in the Control and Management plane of Metro Networks

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Central Office Architecture

Orchestrating the Telecom Cloud

Virtual Infrastructure Manager

Orchestrator

Cloud Resource Manager

Networking Functions

Transport Network Orchestrator

Configuration

Datacenter

Datacenter
Applying Control Loops

Domain Control, Management and Orchestration

Virtual Infrastructure Manager
- Orchestrator
- Cloud Resource Manager
- Networking Functions
- Transport Network Orchestrator

Monitoring and Data Analytics (MDA)
- Data Collector
- Query Engine
- Data Repo

Act

Observe

Analyze

Monitoring

Configuration

Datacenter
• **Single** monitoring and data analytics architecture for the whole infrastructure
• The MDA **connects virtualized components** together and enables **secure data exchange** among them.
Observation Points

Monitorable components and data measured:

1. L2-SI: Ethernet aggregated traffic
2. L2-NI: L2 aggregated traffic
3. L0-CI: Average optical power
4. L0-SI: Average optical power
5. L0-NI: Average optical power
6. L2-LSP: L2-LSP traffic
7. L0-LSP: L0-LSP BER and opt. power

Bringing Data Analytics to the Network Nodes

MDA and COM Architecture
Conceptual COM Architecture

Monitoring and Data Analytics (MDA) Controller

NFV Orchestrator (NFVO)

Network Orchestrator (WIM)
SDN Controller (L2/L3)
SDN Controller (Optical Domain)

MDA Agent

Central Office

Access

Virtual Infrastructure Manager (VIM)

ROADM Controller
XPONDER Controller
Cloud Controller
Local SDN Controller

Communication over the Network (COM)
Network Slicing Support

Pattern evaluation and presentation
Data mining and machine learning
Decision Making

Operator Resources

Network Slices

Pattern evaluation and presentation
Data mining and machine learning
Decision Making

Transformation
Decision Making
Pre-processing
Collection

Customer Network Controller (CNC)
Data Analytics
Control & Management

Domain Control and Management
Slice Manager
Orchestrator
Data Analytics
Network Cntl & Mgmt
Cloud Cntl & Mgmt

L0
IT

Data Analytics

ONDM 2018
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Sample Applications
VNT Design and Reconfiguration Options

Current VNT

Threshold-based reconfiguration

Reconfiguration based on OD traffic prediction

BER Degradation Detection and Failure Identification

Analyzing the optical spectrum

Demonstration
Examples

1. Traffic projection for Planning purposes

2. Failure localization

3. BER analysis for failure root cause identification

Spectrum analysis
Thank you!

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