Zero Touch Network-as-a-Service: Agile, Assured and Orchestrated with NFV

TM Forum Live! Catalyst
June 1-4, 2015
Nice, France

Catalyst Champions: MEF, Axtel, PCCW Global, Spectrum Business
Catalyst Participants: Oracle Communications, InfoVista, Juniper Networks
Agenda

- Catalyst Overview
- Multi-SDO Focus and Standards Alignment
- Business Context: Enterprise and Service Provider Needs
- Catalyst Architecture & Demo Overview
- Next Steps
Catalyst Objectives

1. Address enterprise customer needs for more on-demand, assured, cloud-centric network services.

2. Bridge gap(s) between
   - Key industry standards working to enable NaaS (TM Forum, MEF, ETSI)
   - Service provider and wholesale providers’ process integration
   - BSS/OSS and SDN/NFV-enabled infrastructure
   - Physical network management and virtual network management

3. Provide an end-to-end architectural blueprint on how to get there.
Inspired by the MEF’s Third Network Vision

**Agile, Assured and Orchestrated**

**Agile** – delivery of new, dynamic, on-demand services
- Rapid new service and technology operationalization

**Assured** – delivery of performance and security guarantees

**Orchestrated** – delivery of automated NaaS across
- Multiple network operators’ domains, and
- Multiple internal multi-technology networks
Catalyst: Zero Touch Network-as-a-Service

Agile, Assured and Orchestrated with NFV

Championed by:
- MEF
- PCCW Global
- AxTel
- Spectrum Business

Powered by:
- Oracle Communications
- InfoVista
- Juniper Networks

Self-Service NaaS Quoting & Ordering
Dynamic & Automated NaaS Fulfillment Orchestration
Wholesale E-Access Orchestration
Dynamic Network Service Orchestration (NFV)
Synchronized NaaS Assurance
Service Monetization
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Catalyst Standards Alignment

Multi-SDO Focus

Zero Touch Network-as-a-Service:
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Use Case

Business Process Framework Level 1 Categories

MEF
The Third Network
Agile, Assured, Orchestrated

Service Operations
Guidelines
MEF 50

Network Functions Virtualization (NFV)
Management and Orchestration
Under TM Forum – MEF UNITE Umbrella

Making it Real with Catalyst NaaS Demonstration

Purpose

MEF Starting Point

Collaboration with TMF

Expected Deliverables

Explore

LSO wip

APIs

PoCs

Certification

Industrialize

MEF 50

‘Tool Kit Workshops’

‘Carrier Ethernet Frameworx’

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Sustain

MEF 7.2

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Version 1.0 of NaaS Business Model Canvas championed by PCCW Global, Axtel and Spectrum Business (May 2015)
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I need to expose on-demand self-service quoting and ordering for NaaS sites within and beyond my network footprint

I need:

1. A fully orchestrated Business/Operations solution (MEF LSO)

2. Integration between internal and wholesale partners Business/Operations Orchestration systems
I want

- Quote and delivery turnaround in minutes to match my Cloud IT requirements
- Delivery status and performance visibility
- On-demand service modification (bandwidth, security, etc.)
- On-demand feature/function modification (leveraging NFV)
- Simplify my premise gear and shift intelligence to the cloud to reduce time/cost to install and maintain equipment

I need to automate the ordering, quotation, design, readiness, fulfillment, activation and testing of network connectivity services. I need:

1. A fully orchestrated Business/Operations solution (MEF LSO)
2. Feasibility and ordering API integration to my access provider partners
3. Seamless integration between LSO and the WAN/SDN Controllers
4. Seamless integration between LSO and the NFV orchestration (TM Forum ZOOM)
5. Programmable NFV infrastructure and vCPEs to rapidly instantiate new services.
**Business Context #3: Service Assurance Backed by SLAs**

I need to assure the quality and offer SLAs for end-to-end network connectivity services.

I need:

1. Orchestrated service fulfillment with service assurance applications.
2. Secure and controlled APIs between Operators for SLA and assurance information.
3. Service inventory integrity between LSO and NFV orchestration and my service assurance solution.

I want

- Performance guarantees
- Proactive monitoring
- Consistent service across all sites
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Zero Touch Network-as-a-Service

Agile, Assured and Orchestrated with NFV
Quote-to-order self-service for complex NaaS like a simple IT service
- any Device, from Anywhere
- Bundling of value-added services such as Direct Internet Access, Firewalls, Security, Anti-Virus, etc.
- Technology-abstracted products and user interface
- Integration with key business processes
  - Configuration, pricing and quote management
  - Service and commercial qualification
  - Order management
  - Customer relationship management
  - Billing and revenue management
Real-time, dynamic self-service

- Qualification and quoting based on bandwidth, site(s) and service priority
- Display of automatically designed service topology across internal network domains and partner network
- Order monitoring including order status and estimated service delivery time

Service Quotation

<table>
<thead>
<tr>
<th>Service</th>
<th>Qty</th>
<th>Initial Charge</th>
<th>Monthly Charge</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELAN Service</td>
<td>1</td>
<td>$0.00</td>
<td>$130.00</td>
</tr>
<tr>
<td>ELAN Site (10Mbps)</td>
<td>1</td>
<td>$0.00</td>
<td>$975.00</td>
</tr>
<tr>
<td>ELAN Site (50Mbps)</td>
<td>1</td>
<td>$0.00</td>
<td>$650.00</td>
</tr>
<tr>
<td>ELAN Site (100Mbps)</td>
<td>1</td>
<td>$0.00</td>
<td>$225.00</td>
</tr>
<tr>
<td>Direct Internet Access</td>
<td>1</td>
<td>$0.00</td>
<td>$100.00</td>
</tr>
</tbody>
</table>

Total: $0.00 $2380.00

I have reviewed the terms of the License Agreement and accept its terms.
Automated orchestration across multiple
- Business functions – CRM, billing, order management, assurance, etc
- Network domains
  - Service provider and wholesale
  - Physical and SDN/NFV infrastructure
  - Metro Ethernet, MPLS/VPLS, OpenStack

Intelligent end-to-end service design and orchestration plan computation
Automated NaaS design & assign policies (geographic, path computation)
WAN control layer with service-to-resource abstractions simplifies MPLS and Metro Ethernet service provisioning
Live demonstration of MEF Lifecycle Service Orchestration (LSO) principles in action
Commercial-service -technical decoupling with configurable, meta-data driven execution patterns enables dynamic and automated orchestration.
- Real-life service provider and wholesale partner business and operations environments
- Wholesale provider selection based on POPs
- Implied automated API-based serviceability check (not in demo)
- API-based automated E-Access Wholesale ordering
Dynamic NFV Orchestration
NFV, ZOOM and vCPE

- Business orchestration-driven NFV use case: Customer orders Internet Access for ELAN Service
- Virtual CPE (vCPE) in data center
  - With Juniper Virtual SRX (vSRX)
  - Provides Layer 3 Internet access, firewall, anti-virus and DHCP for all connected sites
- Standards-aligned
  - Network Service Orchestration aligns to
    - ETSI NFV MANO architecture
    - TM Forum ZOOM NFV SID extensions - Network Service, Network Function, Graph
  - Integration with OpenStack for Virtual Infrastructure Management
Synchronized NaaS Assurance

- Service model synchronization and service assurance activation
- Real-time performance management reporting against end-to-end network connectivity services
- Monitoring and utilization dashboard of the end-to-end service across internal and external network domains (Y.1731, utilization KPIs and more)
- Holistic service intelligence distribution
  - Workflows and views for engineering, network operations, customer care, SLA management
  - Self-service dashboards and SLA reports for customer reporting
Synchronized NaaS Assurance

London

Paris

Copenhagen

Berlin

YN:1731 London-Copenhagen
YN:1731 Copenhagen-London

YN:1731 Paris-Copenhagen
YN:1731 Paris-London

YN:1731 Berlin-Copenhagen
YN:1731 Berlin-London
Flexible Revenue Management for NaaS

COMPLEX TRANSACTIONS
- Transaction volumes
- Transaction types per service
- Online and offline transactions
- Transactions with partner revenue sharing
- Taxable/non-taxable transactions
- Subscriptions

ACCOUNT HIERARCHIES
- Large corporate account hierarchy
- Frequent modification of account hierarchies
- Multi-country hierarchies
- Handling large number of accounts per transaction

CHARGE AND RESOURCE SHARING
- Large and varied types of resources shared among large groups in different locations, LOBs etc.
- Charge sharing (e.g., personal vs. business – portion of a single usage transaction charged to business, other portion to employee)

BILLING HIERARCHIES
- Complex billing hierarchies with paying, non-paying, and partial-paying members
- Charge splitting and roll-up across account hierarchies
- Billing relationships across regions, LOB’s and partners

INVOICING, PAYMENTS AND SETTLEMENTS
- Complex invoicing
- Corrections and rebilling
- Complex payment allocations across accounts, departments, regions etc.
- Adjustments
- Dispute settlements
- Partner revenue settlements
- Complex reporting
- Complex revenue accounting
## Catalyst Key Benefits

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FASTER, ON-DEMAND Services</strong></td>
<td>From service activation in days/weeks</td>
<td>… to minutes</td>
</tr>
<tr>
<td><strong>LOWER Costs &amp; INCREASED Agility</strong></td>
<td>From manual processes, truck rolls and fixed resources</td>
<td>… to automated, software-driven service fulfillment leveraging physical and virtualized infrastructure</td>
</tr>
<tr>
<td><strong>INTEGRATED Customer Experience</strong></td>
<td>From siloed management architectures, costly custom B2B integrations, and brittle customer experience</td>
<td>… to a standards-based, agile, assured, and orchestrated operations blueprint and B2B APIs for network services</td>
</tr>
<tr>
<td><strong>NEW REVENUE Opportunities</strong></td>
<td>From a commoditized fixed revenue model</td>
<td>… to billable, usage based services</td>
</tr>
</tbody>
</table>

*NEW REVENUE Opportunities* is shown as a dollar symbol ($).
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- Planned NaaS Use Case enhancements

- Ongoing multi-SDO standards alignment
  - MEF 50 Service Operations Guidelines - Carrier Ethernet Frameworx
  - MEF Lifecycle Service Orchestration and TM Forum API ecosystem
    - Ordering, Catalog, Feasibility, Activation, etc.
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www.mef.net/catalyst2015