tmforum

TRANSFORMATION TO AN AGILE AND VIRTUALIZED WORLD

NEC /Netcracker
SDN/NFV Solutions

For a discussion on how TM Forum's view aligns to that of ETSI MANO, scan the QR code.

THE OPERATIONS CENTER OF THE FUTURE

Focus on customers and services not network Infrastructure

TM Forum has developed many assets to explore how providers need to evolve to maintain their focus on customers and service quality in a virtualized world. For instance an Information Guide to bring out the challenges and impacts of end-to-end Service Assurance and SLA management in a hybrid physical/virtualized environment, (IG1127 – E2E Service Assurance and SLA Management), to see this and other assets , scan the QR code.

Agile working, frequent incremental changes incorporated using a DevOps Approach

TM Forum has assets exploring how providers can increase business agility by adopting key aspects of DevOps methods, for instance an e-book, outlining how to transform from SysOps/NetOps to an agile DevOps approach for the introduction of new services; WHAT DOES IT TAKE TO BE AGILE? To see this and other assets , scan the QR code.

Operations Center of the Future

Automation driven by data analytics and policies to reduce cycle time and cost

TM Forum has assets exploring practical solutions for new business models requiring managing end-to-end a network that is not all owned by a single provider, for instance an e-book, a blueprint for End-to-End management which addresses the essential requirements for effective management of physical and virtualized services end-to-end across multiple provider environments; NFV: CAN IT BE MANAGED? To see this and other assets, scan the QR code.

Extensive liaisons with ecosystem partners both as providers and channels

TM Forum has assets exploring the practical reality of managing hybrid networks, for instance an Information Guide which establishes challenges in a hybrid operating environment comprising both the new NFV based networks services and current network services (IG1122 – NFV Readiness: Operating a Hybrid Virtualization Network Infrastructure). To see this and other assets, scan the QR code.

ZOOM PRINCIPLES

- **Open**, dynamic APIs, exposing standardized network and management functions all layers
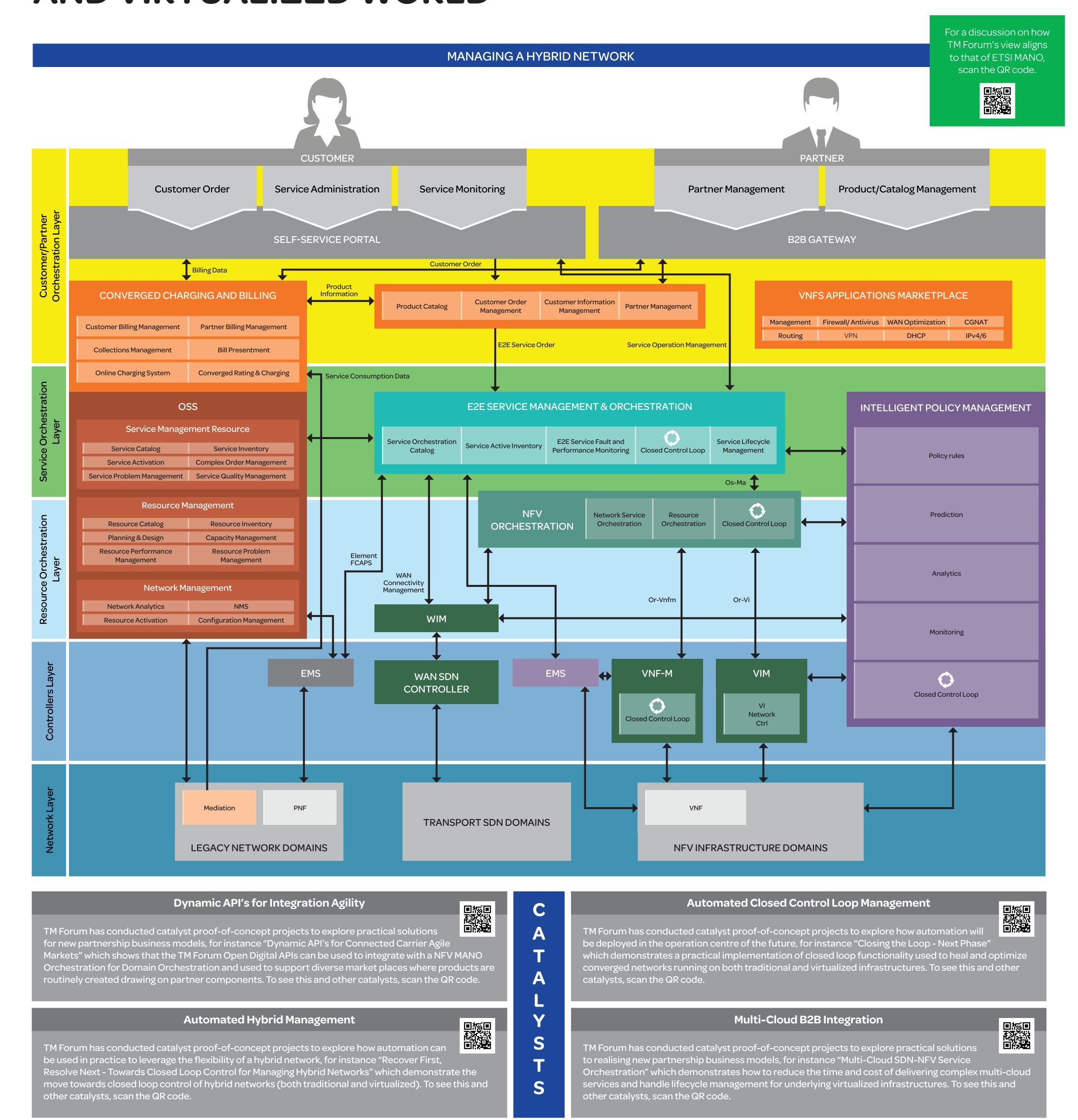- **Transparent end-to-end management** across both horizontal and vertical boundaries
- **Event-driven, using policy management, data, and metadata**, enabling automated management. Management is driven via closed control loop, and may be augmented by analytics
- **Integrated analytics**, enabling a consistent view and analytics from physical to virtual, by design
- **Self-service**, requiring minimal intervention from expert resources and enabling customer configuration

- **Service and business model agnostic**, enabling a flexible range of services and monetization models
- **Multi-tenancy capabilities** native to the infrastructure
- **Near Real-time and zero-touch**, executing requests rapidly without human intervention
- **Hardware agnostic**, separating hardware and software layers, with intelligence held in the software
- **Resilient** to hardware failure and localized load demands through intelligent software
- **Security and privacy** assured by design and at multiple levels
- **Software License management** built in rather added on to enable flexibility

---

MANAGING A HYBRID NETWORK

CUSTOMER — PARTNER

Customer/Partner Orchestration Layer
- Customer Order
- Service Administration
- Service Monitoring
- Partner Management
- Product/Catalog Management

SELF-SERVICE PORTAL — B2B GATEWAY

Billing Data — Customer Order — Product Information

CONVERGED CHARGING AND BILLING
- Customer Billing Management
- Partner Billing Management
- Collections Management
- Bill Presentment
- Online Charging System
- Converged Rating & Charging

Product Catalog | Customer Order Management | Customer Information Management | Partner Management

VNFS APPLICATIONS MARKETPLACE
| Management | Firewall/ Antivirus | WAN Optimization | CGNAT |
| Routing | VPN | DHCP | IPv4/6 |

E2E Service Order — Service Operation Management

Service Consumption Data

Service Orchestration Layer

OSS
Service Management Resource
- Service Catalog
- Service Inventory
- Service Activation
- Complex Order Management
- Service Problem Management
- Service Quality Management

E2E SERVICE MANAGEMENT & ORCHESTRATION
- Service Orchestration Catalog
- Service Active Inventory
- E2E Service Fault and Performance Monitoring
- Closed Control Loop
- Service Lifecycle Management

INTELLIGENT POLICY MANAGEMENT
- Policy rules
- Prediction
- Analytics
- Monitoring
- Closed Control Loop

Resource Orchestration Layer

Resource Management
- Resource Catalog
- Resource Inventory
- Planning & Design
- Capacity Management
- Resource Performance Management
- Resource Problem Management

Os-Ma

NFV ORCHESTRATION
- Network Service Orchestration
- Resource Orchestration
- Closed Control Loop

Network Management
- Network Analytics
- NMS
- Resource Activation
- Configuration Management

Element FCAPS

WAN Connectivity Management

WIM

Or-Vnfm — Or-Vi

Controllers Layer
- EMS
- WAN SDN CONTROLLER
- EMS
- VNF-M (Closed Control Loop)
- VIM (VI Network Ctrl)

Network Layer
- LEGACY NETWORK DOMAINS (Mediation, PNF)
- TRANSPORT SDN DOMAINS
- NFV INFRASTRUCTURE DOMAINS (VNF)

CATALYSTS

Dynamic API's for Integration Agility

TM Forum has conducted catalyst proof-of-concept projects to explore practical solutions for new partnership business models, for instance "Dynamic API's for Connected Carrier Agile Markets" which shows that the TM Forum Open Digital APIs can be used to integrate with a NFV MANO Orchestration for Domain Orchestration and used to support diverse market places where products are routinely created drawing on partner components. To see this and other catalysts, scan the QR code.

Automated Closed Control Loop Management

TM Forum has conducted catalyst proof-of-concept projects to explore how automation will be deployed in the operation centre of the future, for instance "Closing the Loop - Next Phase" which demonstrates a practical implementation of closed loop functionality used to heal and optimize converged networks running on both traditional and virtualized infrastructures. To see this and other catalysts, scan the QR code.

Automated Hybrid Management

TM Forum has conducted catalyst proof-of-concept projects to explore how automation can be used in practice to leverage the flexibility of a hybrid network, for instance "Recover First, Resolve Next - Towards Closed Loop Control for Managing Hybrid Networks" which demonstrate the move towards closed loop control of hybrid networks (both traditional and virtualized). To see this and other catalysts, scan the QR code.

Multi-Cloud B2B Integration

TM Forum has conducted catalyst proof-of-concept projects to explore practical solutions to realising new partnership business models, for instance "Multi-Cloud SDN-NFV Service Orchestration" which demonstrates how to reduce the time and cost of delivering complex multi-cloud services and handle lifecycle management for underlying virtualized infrastructures. To see this and other catalysts, scan the QR code.