# Speakers Bio

**Olivier Augizeau.** **Orange innovation. Network Automation Project Manager.**

Olivier has spent more than 30 years in  different positions in software development and network operations areas. Now Olivier is leading the transport network automation activities in Orange Innovation.

**Mohamed Hassan**. Orange Egypt. **Telco Cloud Engineering & Automation, Senior Manager.**

Mohamed has 22 years of experience in service providers space. Mohamed specializes in service provider virtualized technology and is responsible for creating Telco Cloud long/short term vision and strategy, including "Telco Cloud IaaS, Automation & Orchestration, and B2B & B2C solutions such as SDWAN and other services"

# Speakers Bio

**Abdel-Muhaimen Seaudi,** Head of B2B Solutions, Orange Innovation Egypt



18 years in the Telecom Sector within Orange Group, started in Orange Business Service in Network Operations, then as Senior Technical Architect, and later as Senior Program Manager for OBS and SITA International NNI Partnerships, and now heading the B2B Solutions Department in Orange Innovation Egypt.

**Mohamed Daoud,** Orange Egypt Telco Cloud NFV/DevOps integration , Senior Supervisor



Mohamed ,7 years of experience in service provider domain.
Responsible for  NFV , SDN and Orchestration E2E solutions Engineering and implementation.
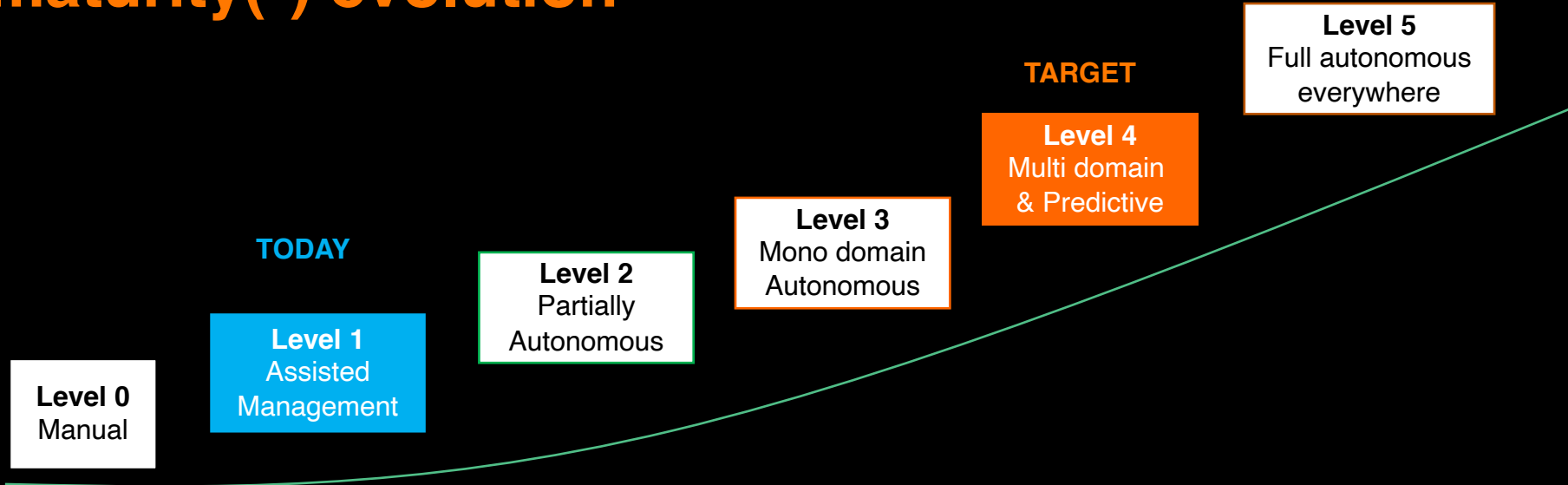
# Challenges to reach Transport Network Automation at Scale

- **Decouple IT-network strong adherences**. This is a current strong impediment for more agility, TTM and cost reduction.

- **Unlock vertical vendor silos**.
    - Network elements management openness,
    - Replace vendor locked vertical management solutions by open solutions

- Network automation has become a **business continuity challenge** (less people with more and complex operations,  enforce and ensure operational processes, …)

# Network Automation journey requires a maturity(*) evolution

**Level 5**
Full autonomous everywhere

**TARGET**

**Level 4**
Multi domain & Predictive

**Level 3**
Mono domain Autonomous

**TODAY**

**Level 2**
Partially Autonomous

**Level 1**
Assisted Management

**Level 0**
Manual

*(*) Level definition is provided in annex From TMForum IG218*

Automation at level 1 can be achieved with stand alone projects on a single use case basis (short term results) with no guarantee to be able to evolve to a higher level.

Automation from level 3 requires a global automation approach

# A disruptive transformation is required

## We have a vision and target.

"*Network management (...) and customer experience have become an IT issue. We need to bring together network and IT.*"

"*The telco industry must move from a closed IT architecture to an open platform architecture accessed throw openly available APIs. This is the purpose of TMForum / Open Digital Architecture.*"

**Stéphane Richard, Orange CEO & chairman,**

at DTW 2020 (Digital Transformation World)

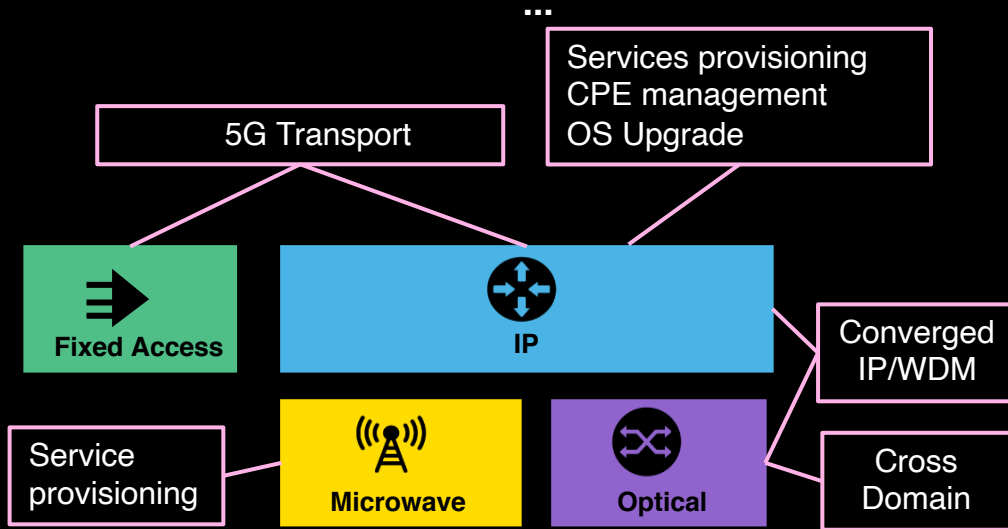Vertical and monolithical applications → modular components organized in layers



*Production  Block* deals with *HOW*? This is a key component for Network Automation.

# Open source is a cornerstone
# To build an ODA compliant platform

**Many use cases**
**with different maturity from exploration to delivery**
...

Services provisioning
CPE management
OS Upgrade

5G Transport

**Fixed Access**

**IP**

Converged
IP/WDM

Service
provisioning

**Microwave**

**Optical**

Cross
Domain

**.... Sharing the same architecture.**

**Common Automation Framework**


ONAP
OPEN NETWORK AUTOMATION PLATFORM

**Domain specific**


OPEN DAYLIGHT


ANSIBLE


NSO

**Other Vendor Solutions**

Interne Orange

# What is ONAP packaged by Orange ?

**A selection of components from the ONAP platform, hardened and packaged to answer transport network automation.**

- ✓ **Prototyping activities, based on real use cases, involving Cisco NSO and Ansible integration to ONAP, have helped to select the functional components.**
- ✓ **Modular design (deploy and use only the required components)**

**The platform must be installed (offline) and hosted in Orange countries data centers**

- ✓ Today, a distribution enabling zero touch installation on bare metal servers, tomorrow in a flexible infra form bare metal to CaaS.
- ✓ A distribution including infra software, ONAP hardened components and additional services (security, CI/CD, operations: logs, monitoring, back-up/restore, …)
- ✓ No fork from ONAP and a distribution following the ONAP roadmap

# Functional Architecture

CFS

Service Order Management

Resource Order Management

Network Mediation

Network

Service Resource Inventory

# Main ONAP components implemented

- **SO** – acts as a "SOM" (Service Order Management" functions)
  - Today, includes some specific Orange Workflows, to be generalized and proposed to upstream

- **CDS** - acts as a "ROM" (Resource Order Management" function)

- **A&AI** – service and resource inventory – single source of truth.
  - Today, includes some specific schema extensions, to be generalized and upstream proposed to upstream

- **OpenDaylight** (replacing the SDN-C), to integrate network mediation components with Netconf interface.
  - Ability to select ODL version and patch is seen as very important.
  - At this stage, no need of DGraph or VNF specific functions embedded in the SDN-C

- Clear split between the business orchestration (at SO – SOM function) and the technical orchestration (at CDS – ROM function ), just exchanging A&AI UID between the layers.

# OEG Journey :-



**Departure**

**Inflight**

**Arriaval**
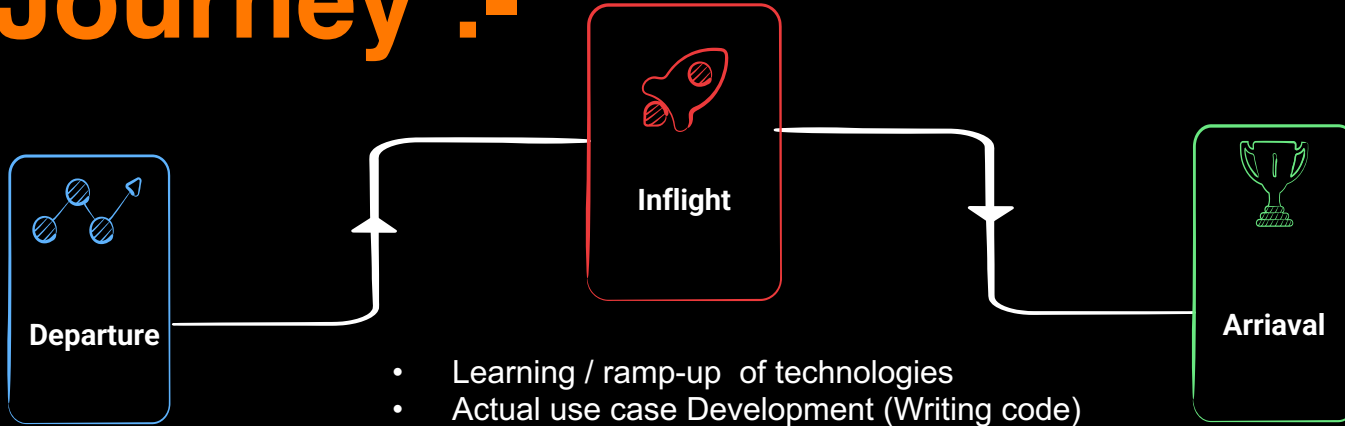
- Challenges :
  - Infrastructure setup
  - Network Connectivity
  - Use case selection and design

- Learning / ramp-up  of technologies
- Actual use case Development (Writing code)
- Testing in virtual lab environment

- Successful ORONAP production field trial
- Successful use case production field trial

## Journey experience:

- Onap is not out-of-the-box , expect customization and development.
- Need more Technical skills for development and operation.
- It is not mature as a production environment.
- It doesn't cover all network automation use case

- It can orchestrate multiple Platforms.
- Enhance user experience , user deals with custom GUI for every service(use case).
- Operationally organized (add, delete, update)

# OEG Network operation challenge (automation opportunity) :-

## Current Situation

- Steps:
  - Service owner request a service (new , update , delete ,…).
  - Engineering/Planning Create WO.
  - Operation deploy WO.
  - Service owner test and validate request of deployment/change.
- Time (Creation , communication , delivery,…).
- Troubleshooting and errors.
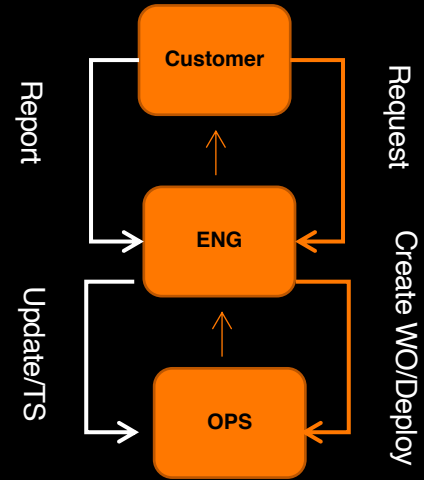


## Automation Opportunity

- Automated resource management (IP subnet, Vlan , VRF , RD , RT ,…. )
- Life cycle management of NS.
- Accuracy (avoid human error).
- Save Time.
- Enhance user experience(MGMT and Deployment).
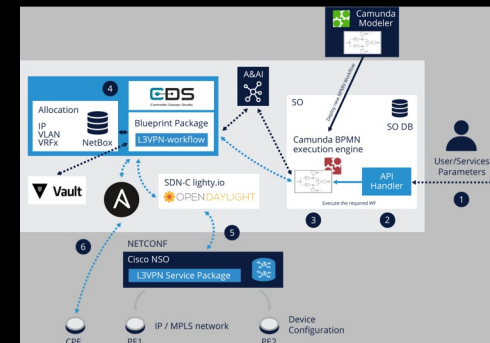
# ONAP/NSO Integration use case for Orange Egypt

## Objective

Use ONAP as higher orchestration layer northbound Cisco NSO to automate different network configuration functions.

## Workflow

1. Using GUI Portal user inputs customer service parameters.
2. ONAP SO launches a custom BPMN workflow a service instance
3. ONAP SO triggers CDS and Lighty.io, updates AAI database with service configuration info.
4. CDS assigns required network resources IP + VLAN from NETBOX, Lighty.io secret from VAULT.
5. Lighty.io will send required service configuration to NSO via NetConf session.
6. NSO uses custom service package to complete network elements configuration.
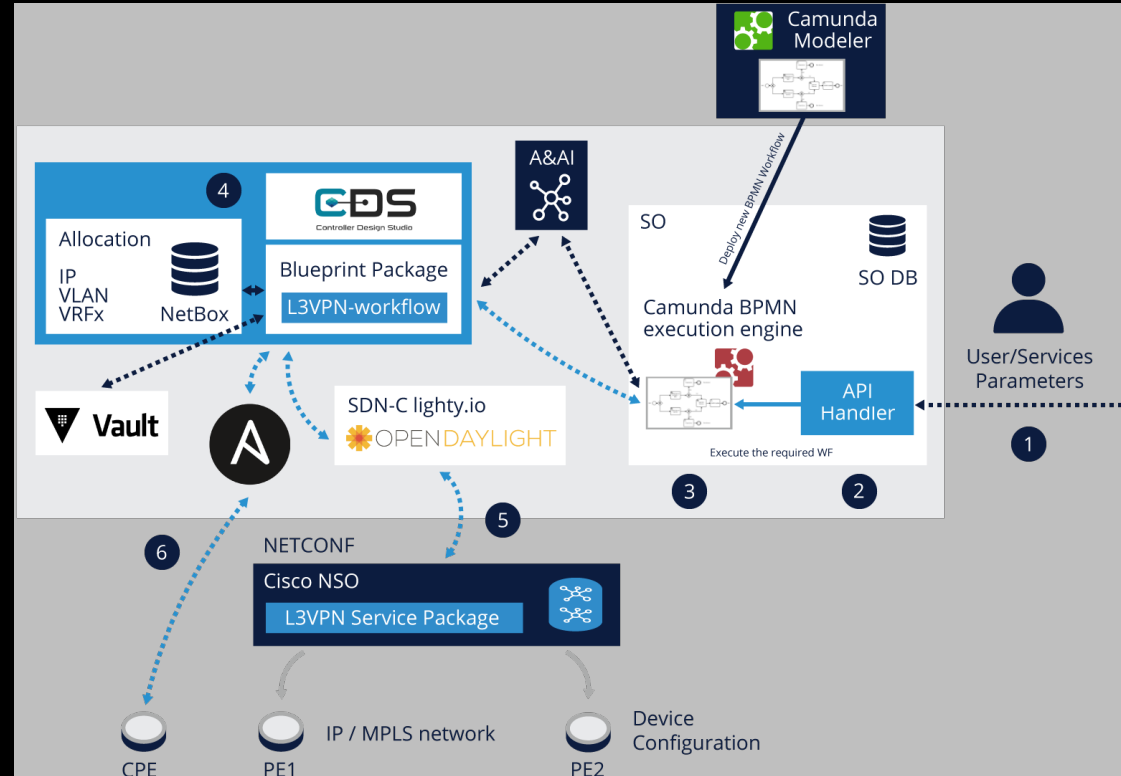
# Take Away

- **ONAP is suitable, not only to prototype 5G use cases, but also to support transport infrastructure automation with a production target.**

- **The community will have to find a balance between mature use cases and components with production target and exploratory topics.**

- **Orange will propose some use case contribution (we guess to the CCVPN project) to upstream workflows and A&AI schema extensions.**

# Questions & Answers

# Appendix: Network Automation Maturity Levels
**(Source IG218 from TMForum)**

- ***Level 0 - manual management:*** The system delivers assisted monitoring capabilities, which means all dynamic tasks have to be executed manually.

- ***Level 1 - assisted management:*** The system executes a certain repetitive sub-task based on pre-configured to increase execution efficiency.

- ***Level 2 - partial Autonomous Networks:*** The system enables partial automatic O&M for certain units based on predefined rules/policies under certain external environments.

- ***Level 3 - conditional Autonomous Networks:*** Building on L2 capabilities, the system with awareness can sense real-time environmental changes, and in certain network domains, optimize and adjust itself to the external environment.

- ***Level 4 - high Autonomous Networks:*** Building on L3 capabilities, the system enables, in a more complicated cross-domain environment, analyzes and make decisions based on predictive or active closed-loop management of service and customer experience-driven networks.

- ***Level 5 - full Autonomous Networks:*** This level is the goal for telecom network evolution. The system possesses closed-loop automation capabilities across multiple services, multiple domains, and the entire lifecycle, achieving Autonomous Networks.