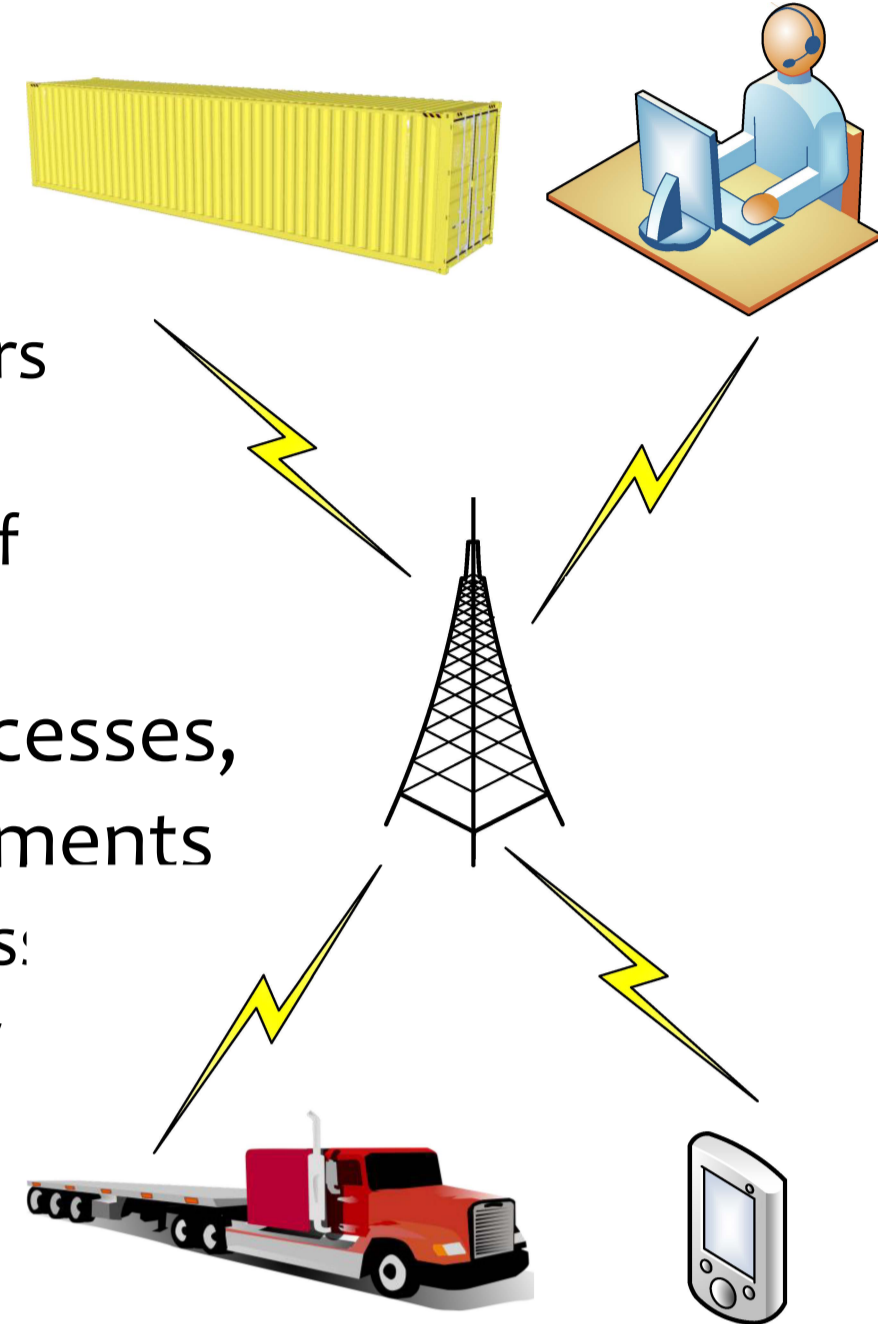




Adaptive Business Process Monitoring Service with Enhanced NFV MANO

Problem setting

- IoT often adopted to monitor business processes
 - Objects participating in the process coupled with **smart devices**
 - Smart devices equipped with sensors and communication interface
 - Status of activities and conditions of objects constantly monitored
- To reliably monitor business processes, network must fulfill QoS requirements
 - Requirements change during process execution, based on current activity
 - Network must be scalable
 - Requirements should be dynamically defined



Advantages in 5G networks

- Designed with IoT in mind
 - Handles high device density and M2M communications
 - Supports Ultra Reliable Low Latency Communications (URLLC)
- Supports network slicing
 - Virtual networks (NFV) with custom QoS
 - Management and Orchestration (MANO) infrastructure

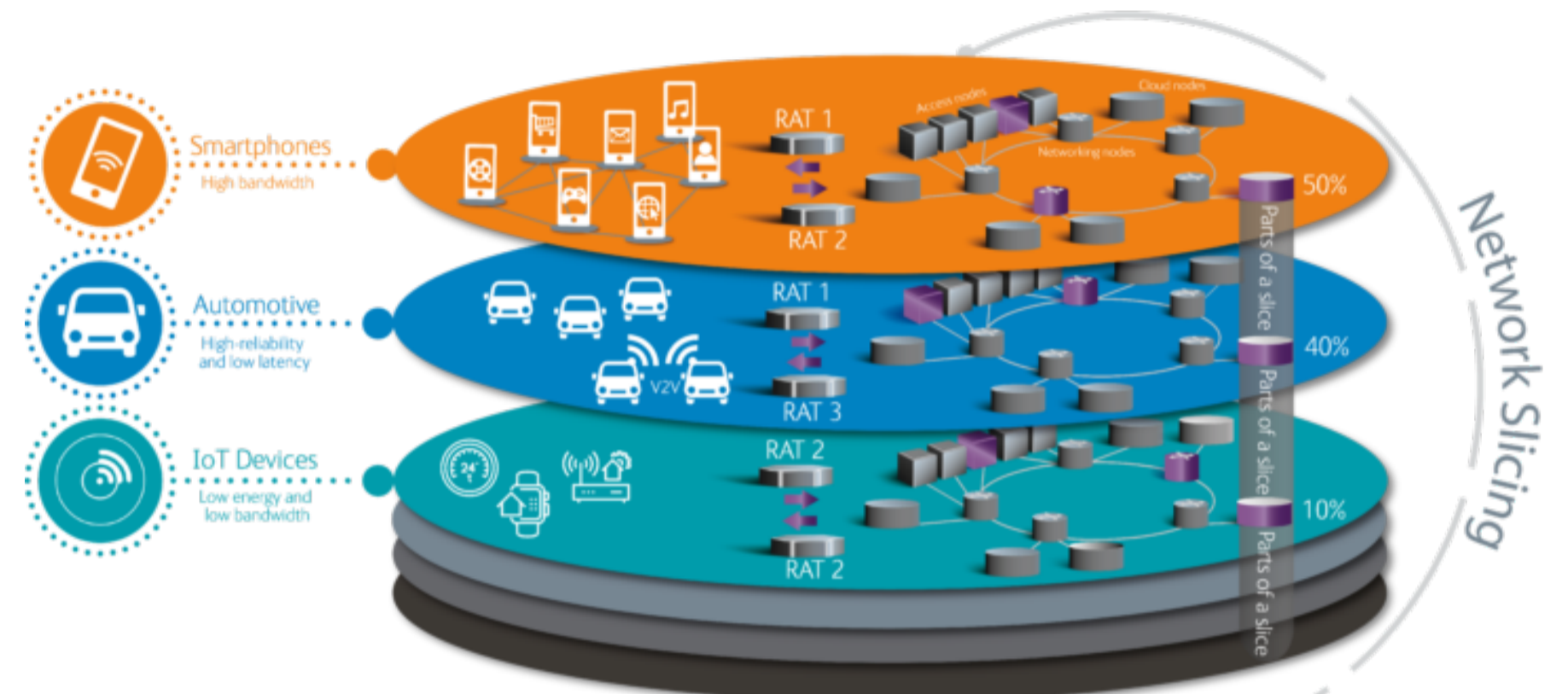
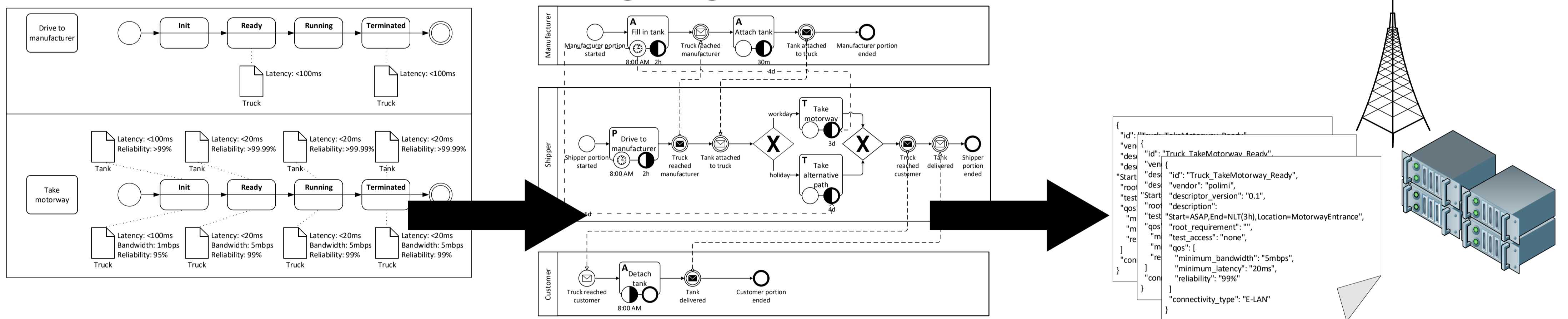


Image source: <https://www.viavisolutions.com/en-us/5g-network-slicing>

Goal: dynamically configuring 5G networks from BPMN process models

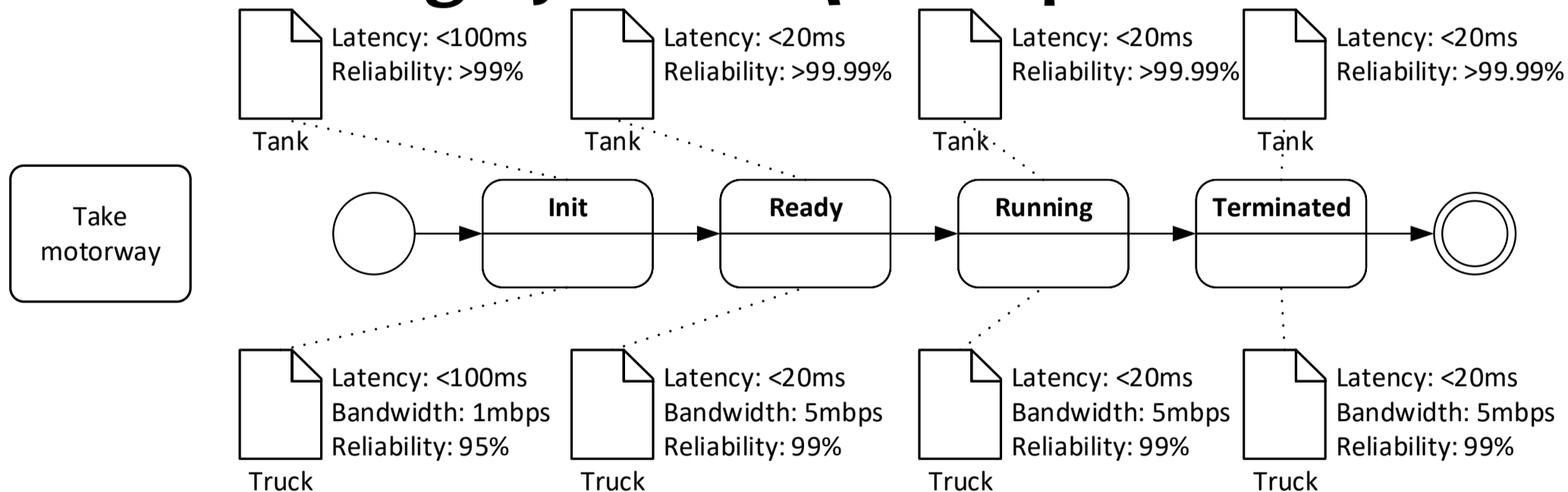


Step 1 Define QoS requirements for BPMN activities

Step 2 Enrich the BPMN model with time and location info

Step 3 Automatically generate configuration files for 5G NFV MANO

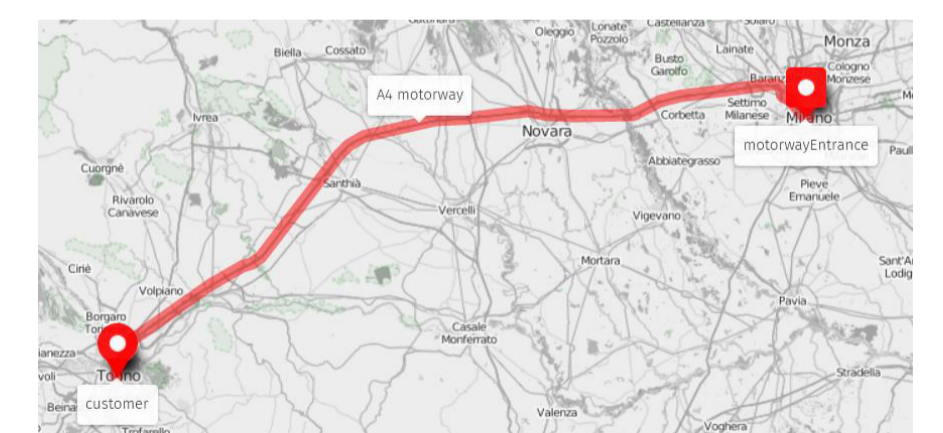
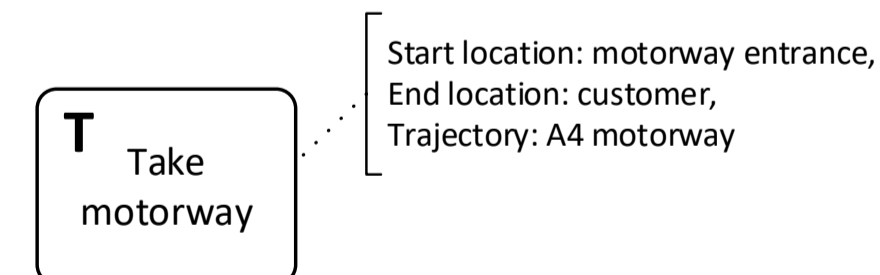
Defining dynamic QoS requirements



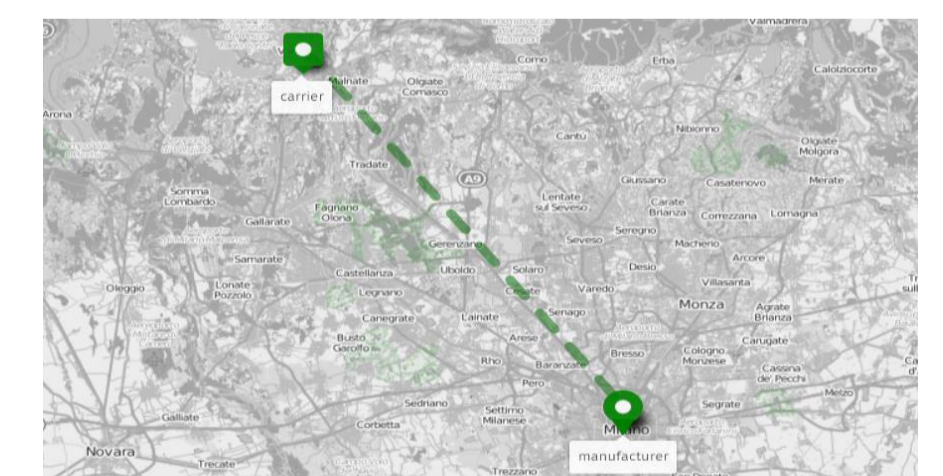
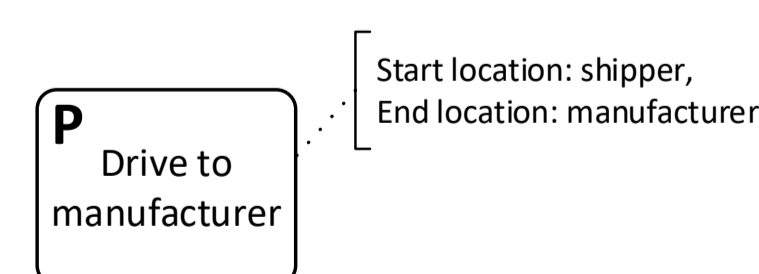
- Starting point: subset of activity lifecycle
 - Init: process initiated
 - Ready: activity ready to start
 - Running: activity being executed
 - Terminated: activity completed
- QoS requirements must hold only when activity enters specific state
 - For each activity A_i , define lifecycle states S_j
 - For each state S_j in A_i , define smart devices SD_k
 - For each smart device SD_k in S_j , define QoS requirements

Introducing location information

Trajectory-based activity



Path-based activity



Area-based activity

