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Monitoring of hybrid environments

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- ▶ Introduction of new network architectures, massive virtualization of the services, cloud based environments creates challenges to follow what's happening along the resources and services delivered by them.
- ▶ Due to dynamism of the assets under management network model driven approach becomes more and more problematic as the instances of the assets may dynamically disappear or be created.
- ▶ Standardization bodies like Tele Management Forum or ETSI uses different data models using different description methods so integration of virtual environments with legacy world becomes also very problematic. Majority of virtual assets uses TOSCA and legacy environments commonly uses SID.
- ▶ Regardless of recent works on making those worlds closer to each other there is no common understanding on how legacy and virtual assets can be observed in the same manner.
- ▶ This leads to the conclusion that traditional monitoring of resources and services in hybrid environment, where cloud and virtual assets are present in parallel to legacy environments, may have little chance of success to provide End to End view.

- ▶ 99% of the traditional monitoring solutions, regardless of the monitoring purpose (fault management, performance management, security threats identification, fraud detection etc.) are based on 3 major steps:
  1. Data collection mainly driven by network model or service models defining relationships among various elements of the model, using set of standardized protocols (most commonly SNMP but also logs from various systems).
  2. Data analysis – in most common way executed also in several standardized steps like
    - a. Data formats normalization
    - b. Data redundancy removal
    - c. Data creation and interpretation (in most cases topology based analysis based on set of predefined correlation rules)
  3. Data visualization and notifications to 3<sup>rd</sup> party systems
- ▶ In static networks (in terms of installed monitored assets) the main differentiator for commercially available solutions is the way they represented data and the flexibility to create correlations between monitoring elements.

- ▶ Such approach is very challenging in hybrid environment where many assets with specific formats are being subject for monitoring. The term "service monitoring" in virtual environment may mean completely different things for physical equipment, hypervisor layers or e.g. VNF layers (if we consider NFV architecture). The same refers to any cloudified assets.
- ▶ Such problem also applies to resources where definition of "resource" starts to be quite blurry
  - what does it mean "resource" in virtual environment – for example shall the logical resource be treated as resource or maybe that is already service.
- ▶ All of that leads to conclusions that traditional monitoring mechanisms, focussed at accuracy and performance will most probably need to step out and enable injection of new mechanisms with more flexibility in analysis. All of that leads to statistical analysis.
- ▶ It also opens door for real prescription mechanisms and closed loop automation.

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## Presenter:

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