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| **Title\*:** | ZSM004 Updates on GSMA and OSM sections | | |
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| input for **Committee**\***:** | ZSM | | |
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| Contribution **For\*:** | Decision | **X** |  |
|  | Discussion |  |  |
|  | Information |  |  |
|  |  | | |
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**Decision/action requested:** For approval

**ABSTRACT:** This contribution proposes an update on GSMA section to capture the recent publication of GSMA NG.127. It also proposes an update on OSM section, changing OSM FIVE features with OSM TEN features.

r1: address comments received on ZSM-Interim#09-e, Monday 12th July

**First of changes**

5.13 GSMA

5.13.1 Network Slicing Management relevant to ZSM in GSMA

The GSM Alliance (GSMA) is a telco industry association representing the interests of mobile operators worldwide, uniting nearly 800 operators with almost 300 companies in the broader ecosystem. A key recognized activity of GSMA is to collect information on service requirements and regulatory issues from different vertical industry associations (e.g. 5G-ACIA, 5GAA), identify potential technologies that can satisfy these requirements, and inform corresponding SDOs (e.g. 3GPP, ETSI, IETF), so that they can develop corresponding technology solutions. One of the key technologies in this regard is network slicing.

GSMA vision on network slicing was first presented in [i.201]. This document was followed by [i.166], where GSMA provided a comprehensive overview about the service requirements on network slicing expressed by business customers from different vertical industries, including AR/VR, automotive, energy, healthcare, manufacturing (I4.0), LPWA, public safety, smart cities, etc. From the analysis conducted in [i.166], GSMA noted that service requirements on network slicing could be classified into performance, functional and control and management requirements. However, it concluded that there was no agreement on how vertical industries should express these requirements towards network operators. In this regard, GSMA agreed on the need to harmonise network slicing definition, identify network slice types with distinct characteristics and consolidate parameter and functionality requirements, from end-to-end perspective.

GSMA work on network slicing management is organized into two main workstreams.

The first workstream has the target to map service requirements from vertical industry use cases into network slice requirements. Based on the conclusions from [i.166], GSMA suggested that it was necessary to develop a solution able to offer verticals guidelines on how to issue service requirements on network slicing towards network operators, therefore addressing the existing gap between vertical and telco industries. To that end, the Generic network Slice Template (GST) has been defined and documented in GSMA PRD NG.116 [i.167]. The GST provides a universal description of a network slicing, containing all the potential attributes a network slice could have. It allows the network slice provider and a network slice customer to agree on SLA for a given network slice, by means of filling GST attributes with values based on service requirements. The GSMA Networks Group (NG) is responsible for updating and maintaining GSMA PRD NG.116 GST specification.

ZSM can cooperate with GSMA NG on how to satisfy the slice management related requirements identified in the GST.

The second workstream has the target to provide a deep end-to-end network slice architecture analysis, with the mission of identifying existing gaps and informing corresponding SDOs, fostering cross-standardization collaboration to address these gaps. The first results of this analysis have been documented in the GSMA NG.127 [i.x]. This activity is also led by the GSMA NG.

ZSM can cooperate with GSMA NG on how to address cross-domain network slice management related issues identified in the end-to-end slicing architecture.

**2nd change**

### 6.2.2 FM and PM in OSM relevant to ISG ZSM

Alarm management is automated based on monitoring and collected data (events and metrics). Alarms can be created based on metric thresholds or associated with events relevant for the proper operations of NSs. Alarm management plays a central role in auto-scaling behaviour too. Monitoring data (metrics) is stored and correlated in a local, highly scalable and performant Time Series Database to enhance lifecycle automation based on metrics aggregation and correlation, independent of their source.

Figure 6.2.2-1 demonstrates how Fault Management is implemented.



Figure 6.2.2-1: OSM Fault Management Architecture

Performance management and policy management are also facilitated by monitoring and can be used to support auto-scaling. Figure 6.2.2-2 demonstrates how Performance Management is implemented.



Figure 6.2.2-2: OSM Performance Management Architecture

The latest version is OSM Release TEN [i.176]. With this and previous versions, the OSM supports following features that are relevant to ZSM:

* E2E service orchestration across virtual domain, transport domain, and physical and hybrid network elements, with dynamic interconnections between DCs across heterogeneous WAN technologies.
* Multi-Site and multi-VIM support enables automated service delivery across multiple sites and VIMs. To manage resource capacity in the Transport network connecting remote sites, different WAN Infrastructure Manager (WIM) connectors can be used.
* A well-known Information Model (IM) that support Network Slices and Network Services (NS) composed of (virtual, cloud-native, physical) Network Functions, i.e. xNFs. Its abstraction features reduce complexity for developers, vendors and service providers to design services.
* soNetwork Service Of particular interest is the ability to take intelligent decisions for NS placement at provisioning time, with the integration of the Placement Optimization Module (PLA). The PLA allows to automatically find the most cost-efficient distribution of the xNFs in an NSD over the set of available VIMs when a Network Service is instantiated.
* Dedicated and unified channel (message bus) for asynchronous communication between components, which makes OSM open and simple to integrate with new pluggable modules, facilitating the access to a coherent set of common services.
* Service Modelling to simplify, accelerate and standardize the design-time phase.
* Among other techniques, it also provides a sound support of Service Function Chaining (SFC) to simplify service composition.
* Policy-based closed-loop control with extended monitoring capabilities to assure services.
* Monitoring and data collection covers both VIM and xNF. Additionally, monitoring data (e.g. alarms) are evaluated and notified to consumers via Kafka bus.
* Auto-scaling, supported by the policy-based fault management, performance management to enable certain degree of zero-touch operation and automation. This includes scaling for native Kubernetes charms.
* Policy manager coordinated with LCM orchestrator to automate the horizontal scaling decision at a fine VDU granularity.
* Subscription management, to allow OSS to subscribe to LCM events by using a Python library, and to facilitate the integration of third party systems [i.176]. Further information on these subscription management capabilities can be found in [i.176] and [i.y]
* A unified and model-driven northbound interface to control OSM system, compliant with ETSI GS NFV‑SOL 005 [i.18] (RESTful protocols specification for the Os-Ma-nfvo Reference Point) for NS management. For network slice (subnet) LCM, this interface is extended with some additional capabilities. This provides a standardized mechanism that protects the investment of the integration efforts, as stated in [i.176].

At the initial stage, the scope of OSM covers only some aspects (present some similarities) of the ZSM architectural vision, such as (E2E) network services and network slices orchestration, performance management, fault management, and service/data capability exposure. In addition, OSM has the similar goal as ZSM by making efforts towards automating slice and service provisioning. OSM will be extended to implement its goal with the inspiration of the current ZSM work.

**3rd change**

[i.167] GSMA: "Generic Network Slice Template Version 5.0".

NOTE: Available at https://www.gsma.com/newsroom/wp-content/uploads//NG.116-v5.0-7.pdf

[i.x] GSMA: “E2E Network Slicing Architecture v1.0”

NOTE: Available at <https://www.gsma.com/newsroom/wp-content/uploads//NG.127-v1.0-1.pdf>

[i.176] OSM Release TEN, https://osm.etsi.org/wikipub/images/3/30/OSM\_Release\_TEN\_-\_Release\_Notes.pdf

[i.y] OSM Release EIGHT, https://osm.etsi.org/wikipub/images/5/56/OSM\_Release\_EIGHT\_-\_Release\_Notes.pdf

**End of changes**