

ETSI ZSM activity on Artificial Intelligence

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NMRG57

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ETSI ZSM ISG

- Zero Touch Network and Service Management
- Created Dec. 2017, renewed for 2-years term \Rightarrow Dec. 2021
- Objectives:
 - Define an end-to-end automated network and service management architecture
 - Support both legacy and virtualized network infrastructures
 - Collaborate with relevant open-source projects, standardization bodies and fora
 - Create a foundation for diverse open source groups to produce interoperable solutions
- Links:
 - ZSM Technology Page: <http://www.etsi.org/zsm>
 - ZSM Wiki: <https://zsmwiki.etsi.org/>
 - ZSM Open Area (Draft specs): <http://docbox.etsi.org/ISG/ZSM/Open>
 - ZSM Portal (members' working area): <http://portal.etsi.org/zsm>

ZSM framework reference architecture

ZSM service aka management service: A set of offered management capabilities.

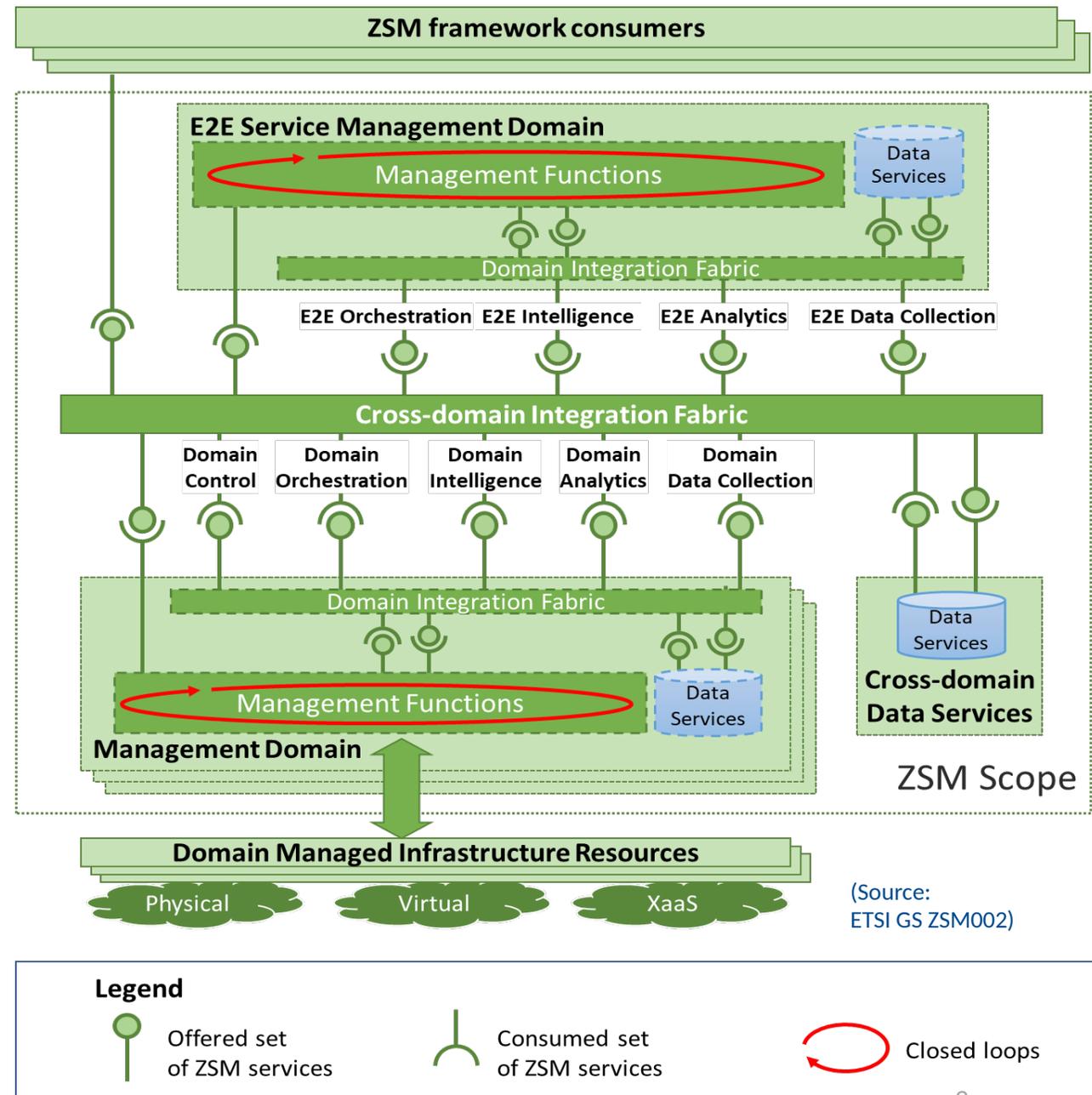
Management function: Logical entity playing the roles of service consumer and/or service producer.

Integration fabric: A management function, playing the roles of both service consumer and service producer, that enables interoperation and communication between management functions within and across management domains.

Cross-domain data services: Services that allow to share data with authorized consumers across domains.

Management domain: A scope of management delineated by a technological, business, administrative or other boundary.

E2E service management domain: A management domain specialized to manage E2E services.



ZSM architecture feature: Service-based

The ZSM architecture defines management services which can be provided and consumed by management functions.

(The realization of management functions is out of scope.)

Domain data collection

- Event notification services
- Performance measurements streaming service
- Performance measurements collection service
- Log collection service

Domain analytics

- Analytics services
- Domain condition detection service
- Data optimization services

Domain intelligence

- AI model management service
- Deployed AI model assessment service
- AI training data management service
- Knowledge base service
- Health issue reporting service

Domain orchestration

- Domain orchestration service
- Feasibility check service
- Managed services catalogue management service
- Testing service
- Domain inventory information service
- Domain inventory management service
- Domain topology information service

Domain control

- Resource configuration management service
- Resource lifecycle management services
- Configuration data generation service

E2E service data collection

- E2E performance data reporting service

E2E service analytics

- Analytics services
- E2E service quality management service
- E2E service condition detection service

E2E service intelligence

- AI model management service
- Deployed AI model assessment service
- AI training data management service
- E2E service health issue reporting service

E2E service orchestration

- E2E service orchestration service
- Feasibility check service
- Managed services catalogue management service
- E2E testing service
- E2E services inventory information service
- E2E services inventory management service
- E2E services topology information service

Integration fabric services

- Management services registration service
- Management services discovery service
- Management communication service
- Management service invocation routing service
- Management capability exposure configuration service

Data services

- Data store management service
- Data persistence services
- Data processing service

Domain Analytics

- The domain analytics services provide domain-specific insights and generate domain-specific predictions based on data collected by domain data collection services and other data (e.g. data collected by other domains or stored in data services).
- In support to different types of analytics: hindsight, insight, foresight aka descriptive, diagnostic analytics, and predictive analytics.

Domain Intelligence

- Domain intelligence services are responsible for driving intelligent closed-loop automation in a domain by supporting variable degrees of automated decision-making and human oversight with fully autonomous management being the final stage
- Intelligence services can be categorized as follows:
 - 1) Decision support
 - 2) Decision making
 - 3) Action planning
- Decision support services enable decision making via technologies such as artificial intelligence, machine learning and knowledge management

Data Services

- Data services provide means of data persistence and enable data sharing with authorized consumers within and across management domains, subject to information security and data governance regulations.
- Data services also enable abstraction of data persistence and data processing actions from the management functions. This enables stateless management functions and eliminates the need to handle data persistence and processing on per-function basis.

ZSM architecture feature: Enabling automation based on closed loops

Observe

- *Data collection services* monitor the managed entities (resources and services), and provide live performance and fault data to support closed-loop automation.

Orient

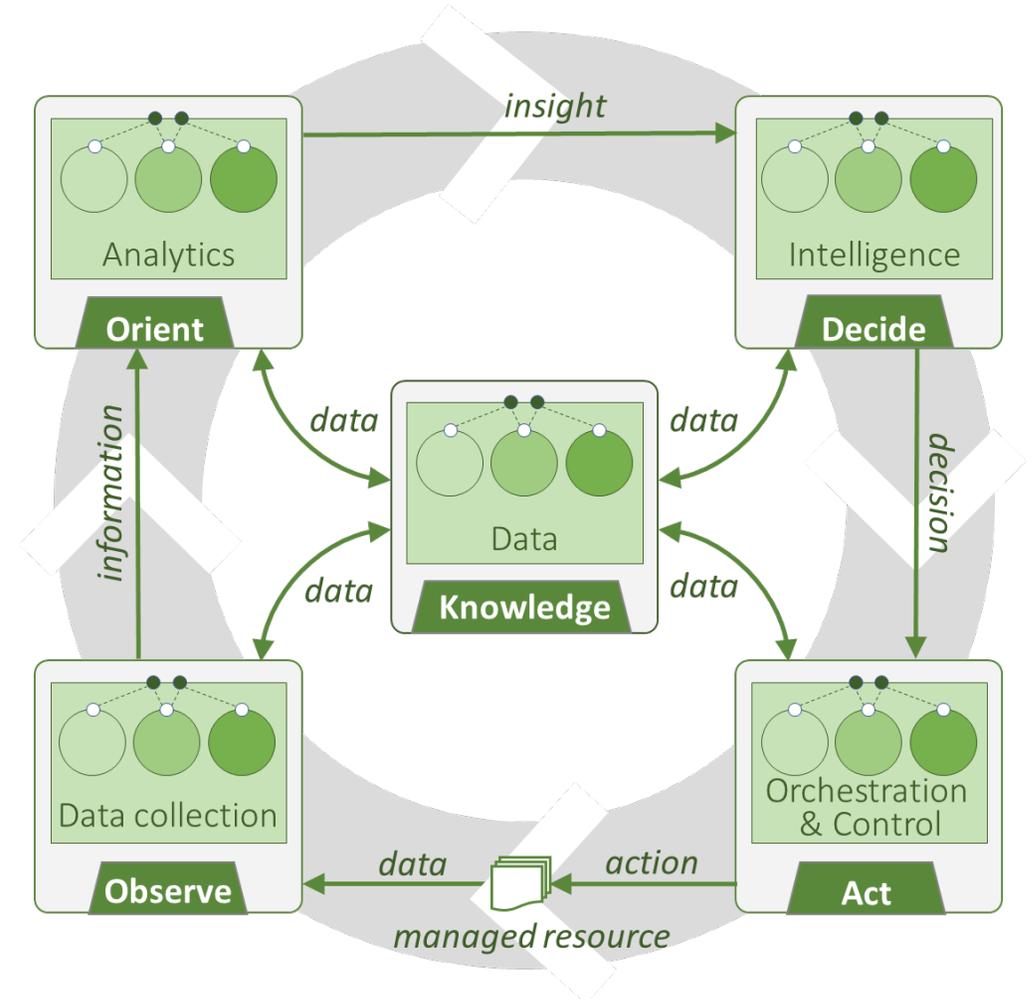
- *Analytics services* provide specific insights based on data collected by data collection services and on other data / knowledge.

Decide

- *Intelligence services* provide specific decisions and recommendations, to drive closed-loop automation.

Act

- *Orchestration services* automate workflows and processes to handle instantiation and lifecycle management of the managed services.
- *Control services* individually steer the state of each managed entity (resource, service).



ETSI GS ZSM002

- The specification was published by ETSI in August 2019 and is publicly available here:
https://www.etsi.org/deliver/etsi_gs/ZSM/001_099/002/01.01.01_60/gs_zsm002v010101p.pdf

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Zero-touch Network and
Service Management
(ZSM);

Reference Architecture