



The Standards People



ETSI ZSM work items on Closed loop automation

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Motivation

- ✔ Further specify how Closed Loop Automation can be realized within the ZSM framework
- ✔ Identify gaps and improve the ZSM framework
 - ✔ New management services and capabilities
 - ✔ Use case-agnostic enablers
 - ✔ Solutions to documented scenarios
- ✔ Enable the creation and execution of closed loops, as well as the integration and interoperability between closed loops within ZSM framework
- ✔ Influence/collaborate other SDOs and open source projects



ZSM009 – Closed Loop (CL) Automation

ZSM009-1 – Enablers

- Enablers for closed loop automation for multiple use cases
- Mainly divided between:
 - CL Governance
 - CL Coordination
- Extension of ZSM framework with new management services and capabilities

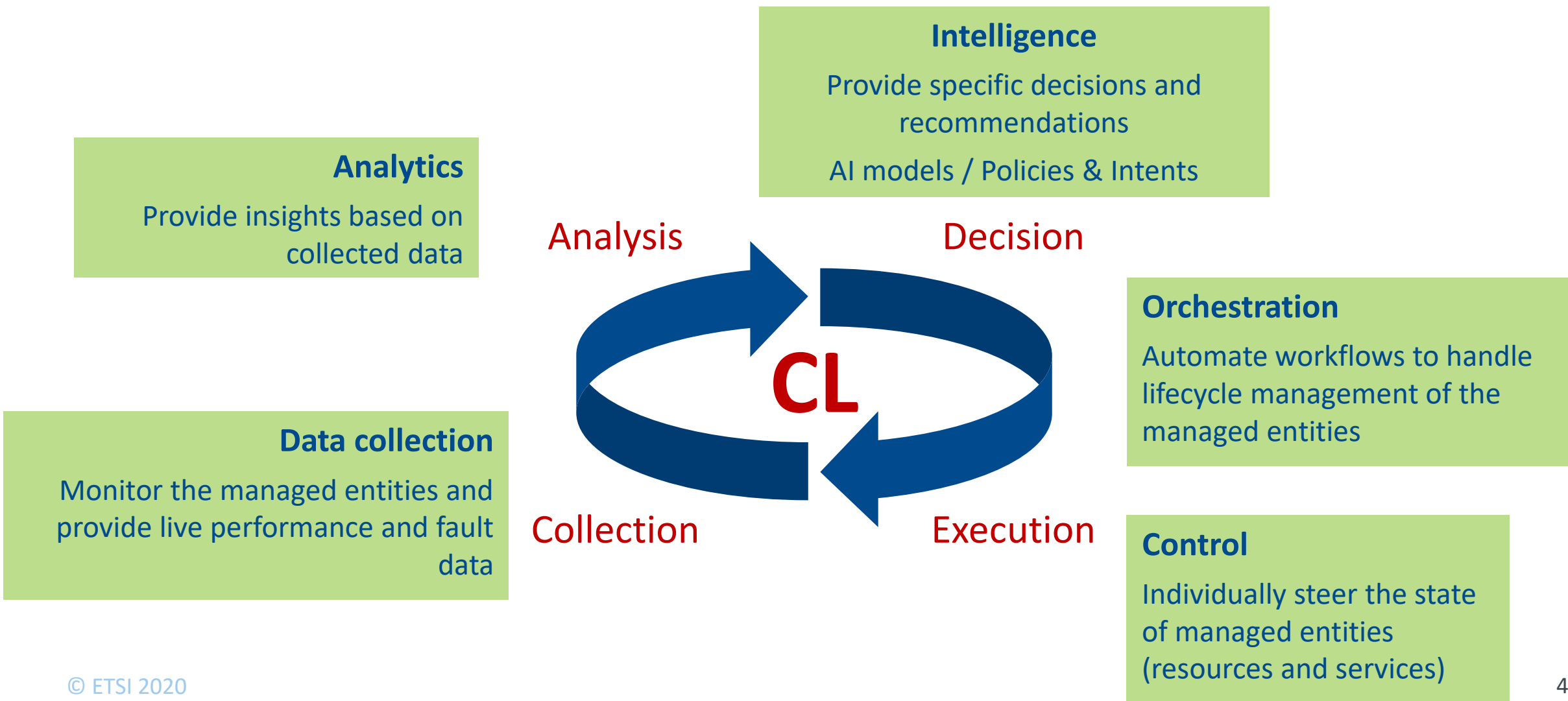
ZSM009-2 – Solutions

- Solutions for end-to-end service and network automation
- Based primarily on the scenarios of ZSM001
- (Re)-uses the enablers specified in ZSM009-1

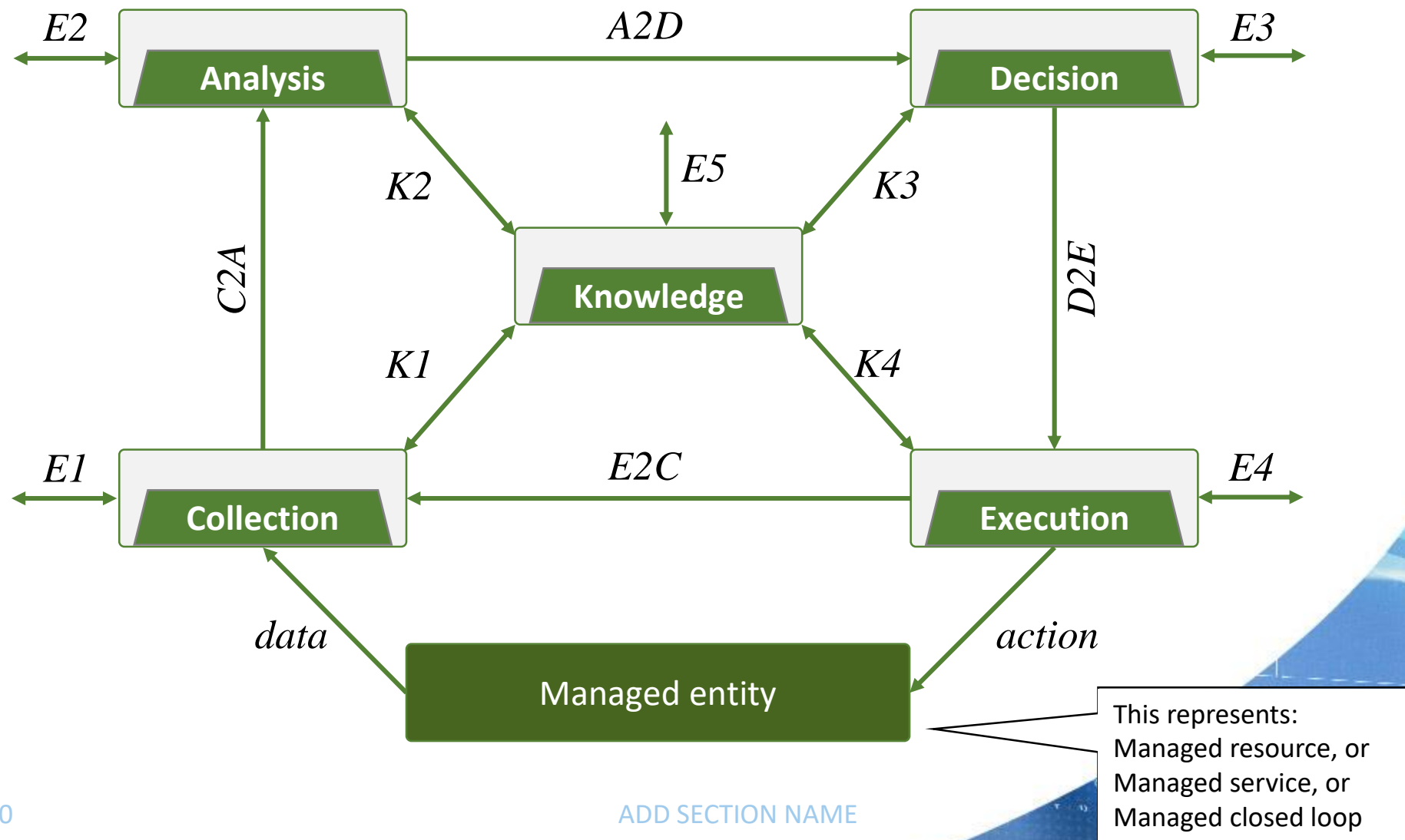
ZSM009-3 – Advanced topics

- Advanced topics, such as cognitive capabilities
- Problem statements and potential solutions

ZSM framework management services grouping (Example)



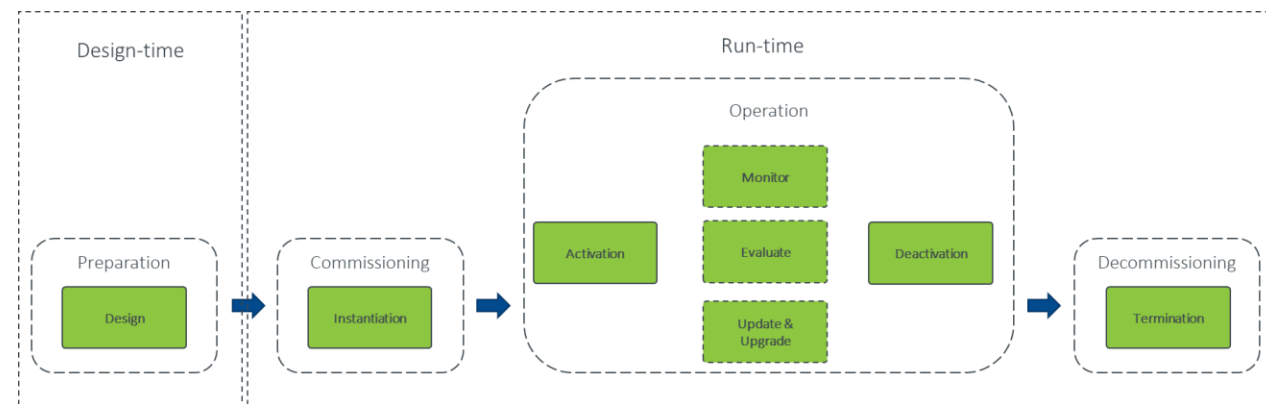
CL in ZSM framework - Functional view



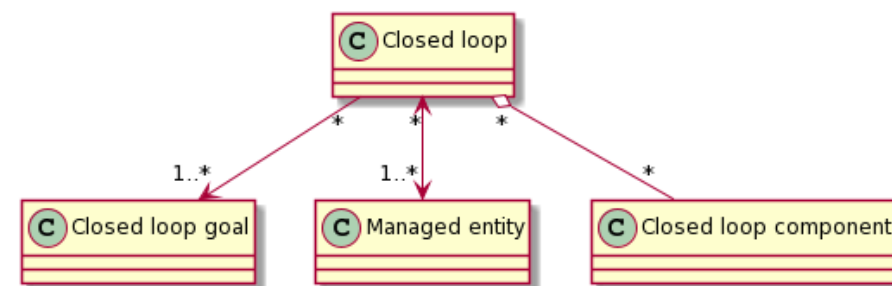
Closed loop governance

- Set of capabilities for external entities to manage the CL models and the lifecycle of CLs (design-time AND run-time);
- Configuration of policies, rules, triggers and priorities for the CLs;
- Status and performance information of the CLs.

CL LCM – Phases and activities

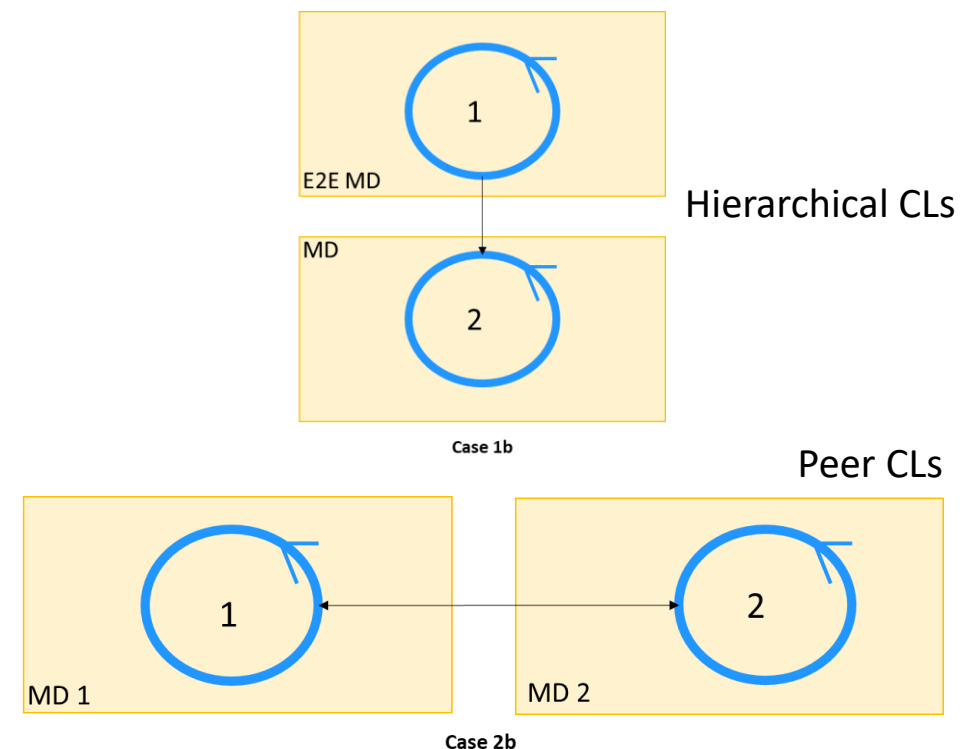


Closed loops (meta)model



Closed loop coordination

- ✔ Set of capabilities that allows multiple CLs running within the ZSM framework to be coordinated (run-time)
- ✔ Main objective: improve the performance and the fulfilment of the CL goal(s)
- ✔ Focus on conflict detection and mitigation
- ✔ Pre-action and post-action coordination
- ✔ Delegation and escalation
- ✔ Information sharing between multiple CLs



Solutions for various scenarios specified in ZSM009-2

✔ Solutions for Management automation scenarios

- Dynamically configurable monitoring
- Plug n Play
- Back up services
- Automated service healing

✔ Related to CL coordination

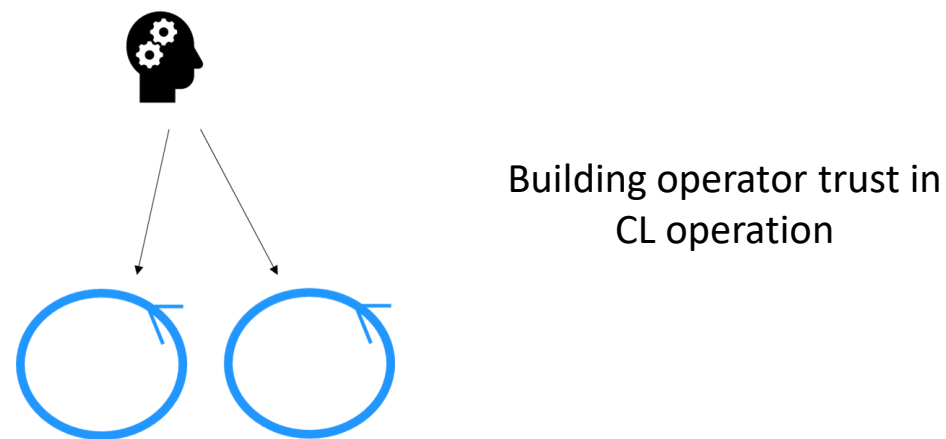
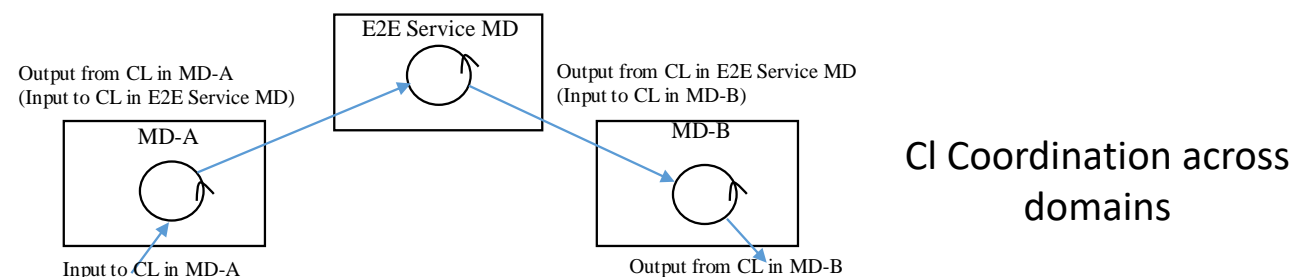
- Escalation/Delegation
- Knowledge sharing
- Limiting actions

✔ Related to AI/Analytics

- Maintenance of the AI model in CLs
- Use of analytics in CL

✔ Building trust in CL

- Logging the actions of a CL
- Pausing a CL



ONAP transport slicing and ZSM closed loops

- ✓ Governance of multiple closed loops using Closed Loops models and CL LCM
- ✓ Coordination of multiple closed loops using CL Coordination Management Services
- ✓ **Potential for collaboration**
- ✓ Solutions specified in ZSM009-2

