

CIS Exchange specification

Supporting TMPlan Workflow Management

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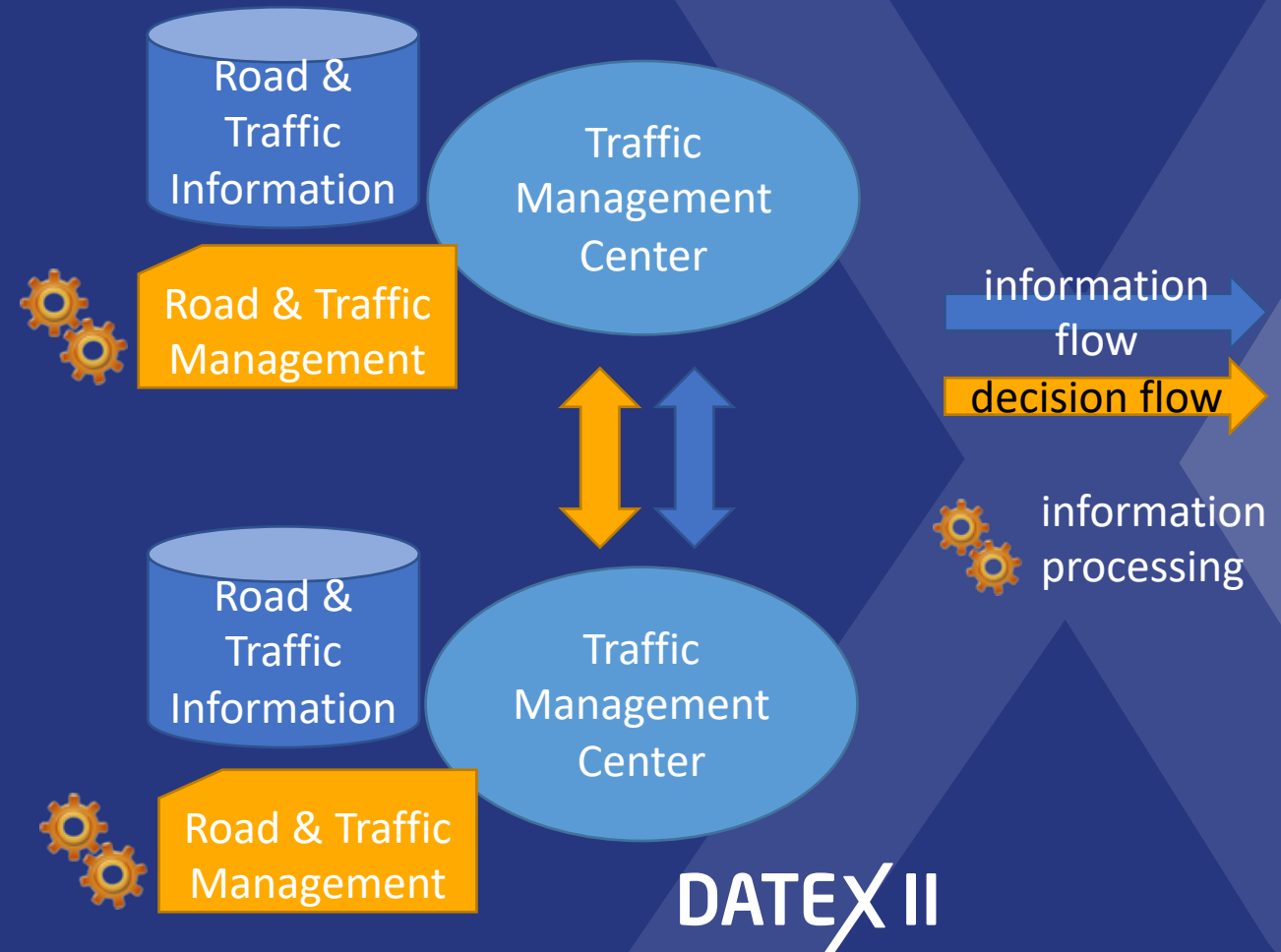
27th of January 2021



Exchange Specification supporting DATEX II

It includes decision specific requirements:

- **Bidirectional**
 - Request
 - Feedback
- **Transactional**
 - preemptive, atomic
 - non preemptive, atomic
- **Support to processing**

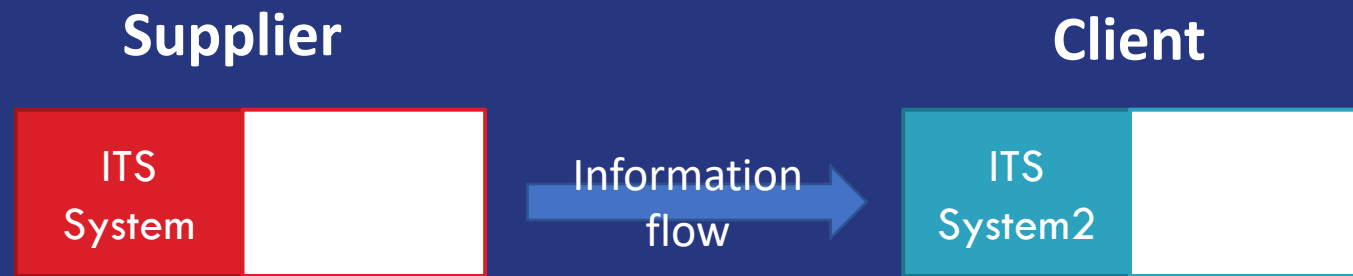


CIS use cases

- Operators Needs to Manage Devices based on Conditions which may arise in neighboring Network
 - VMS Messaging / SignSetting
 - Cameras, Lane Control Systems, Traffic Lights
- Combined Network Operation
 - Traffic Management Plans (TMPs / TMPlan)

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Information Delivery actors

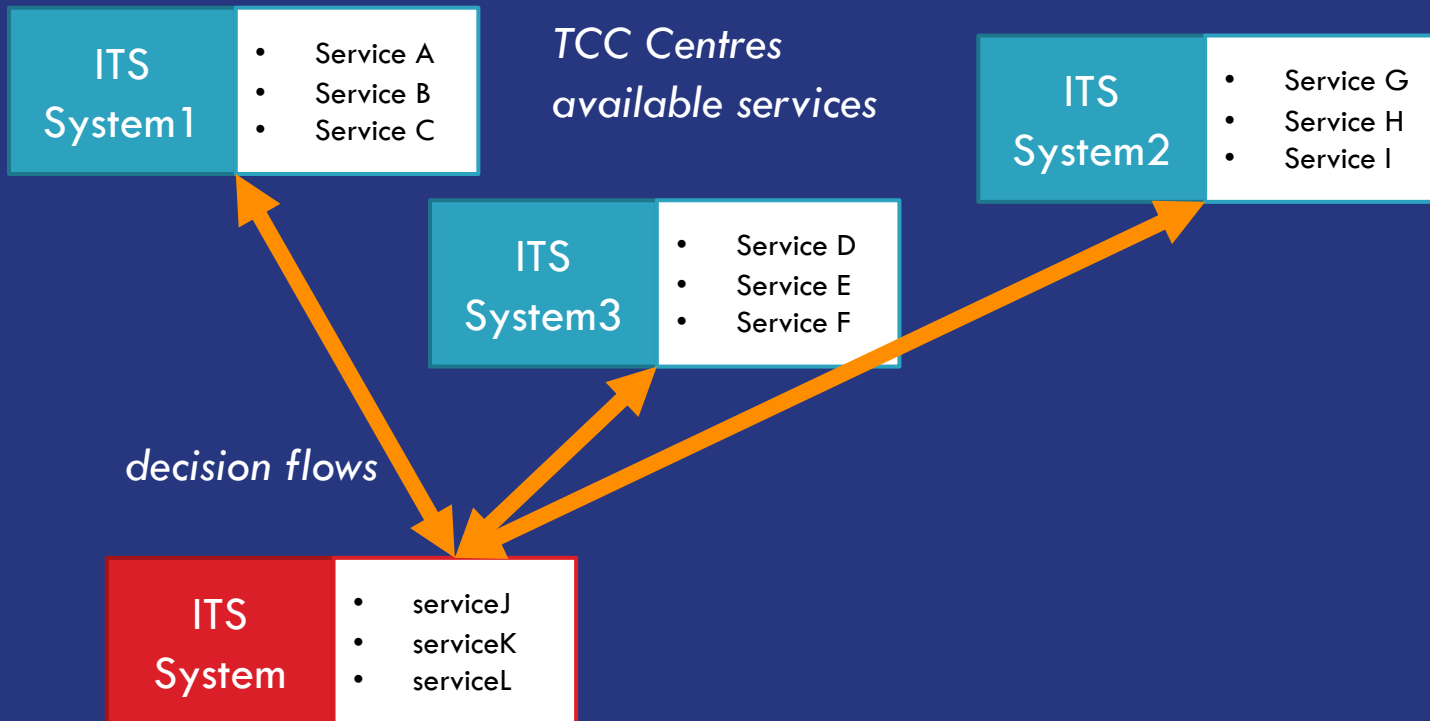


Interaction Model

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ITS Collaborative Services actors

ITS Service Providers



ITS Service Requester

ITS Services

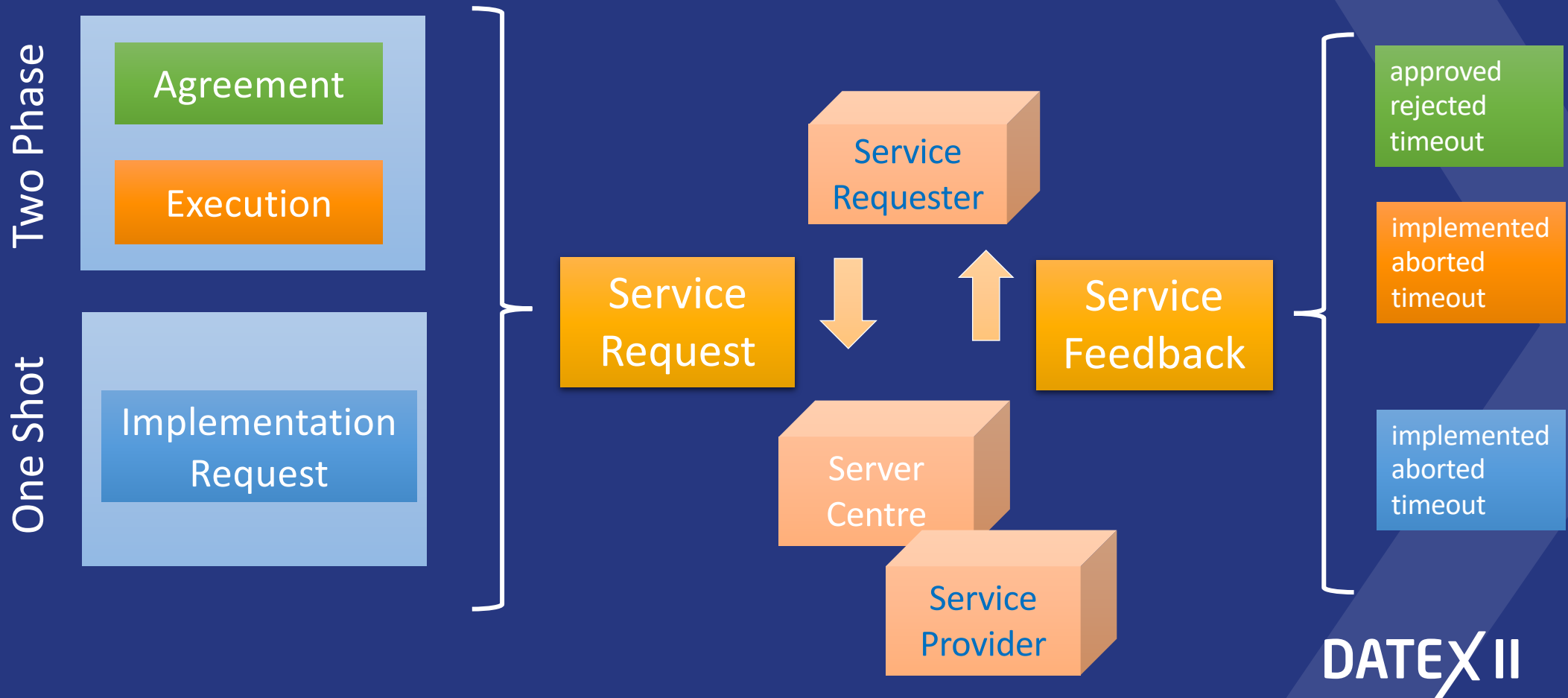
- Specific VMS Message request
- Specific Camera Settings
- Specific Road Management
- Specific Information Delivery Service (e.g. broadcast TMC)

CIS as distributed services operation

- Call Service CIS **ALPHA**
 - System1 (Service B)
 - System2 (Service H)
 - System3 (Service D)

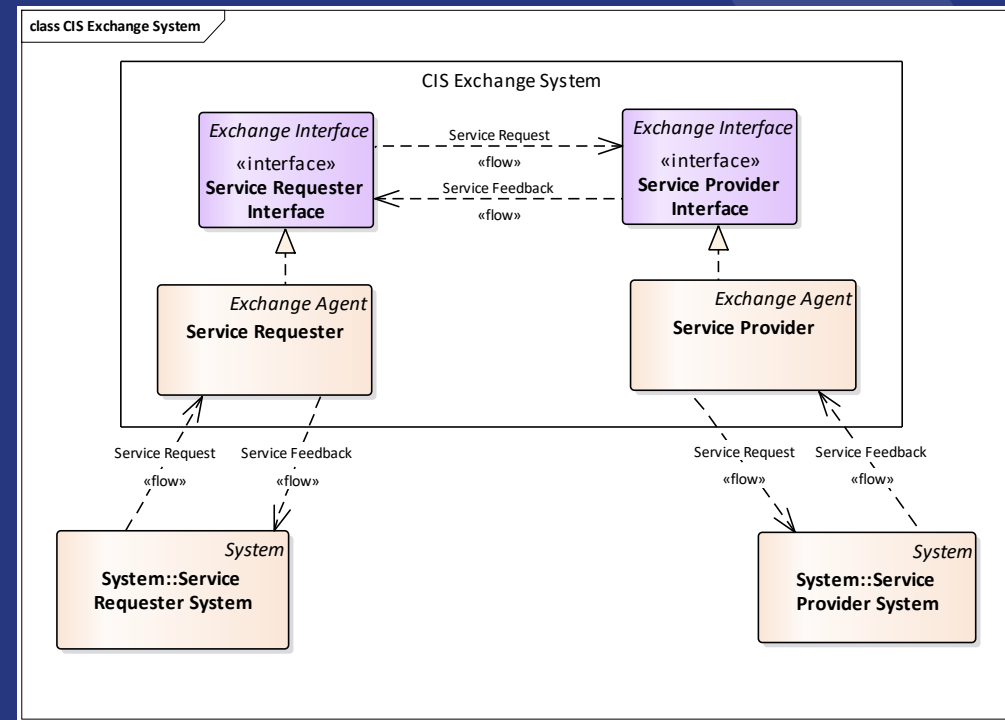
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CIS Operation Workflow Management



CIS Exchange Modeling

- Service Provider and Service Requester roles
- Exchange Agent specialisation
- Service Request and Service Feedback interfaces



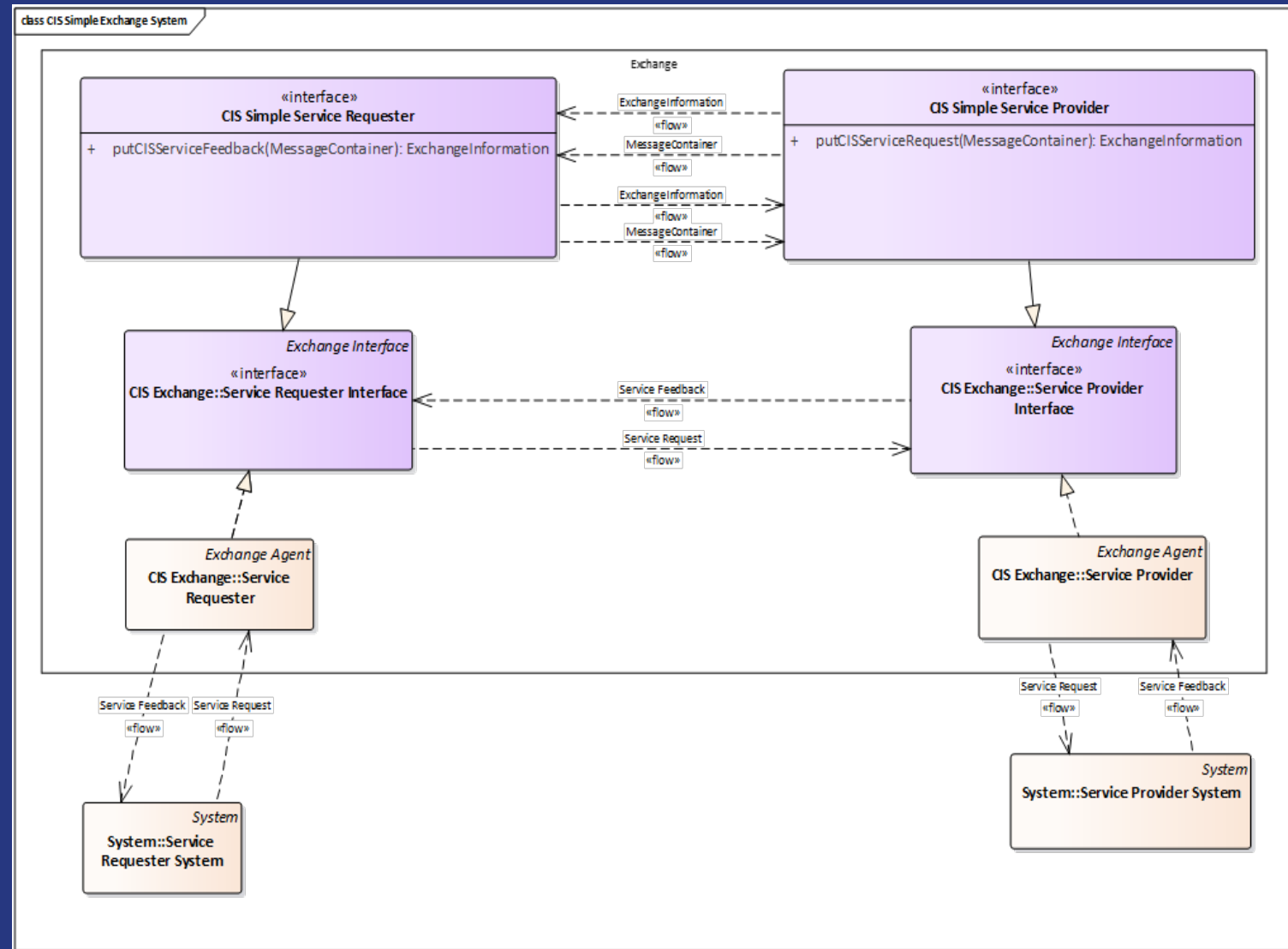
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Simple CIS

Sessionless Exchange

- When needed a service request can be instantiated
- A Service Feedback can be supplied as processing request result
- No connection status monitoring, management decision can be unaware of problems on Service Provider node.
- Service Request errors have only minor consequences and do not imply blocking of other actions

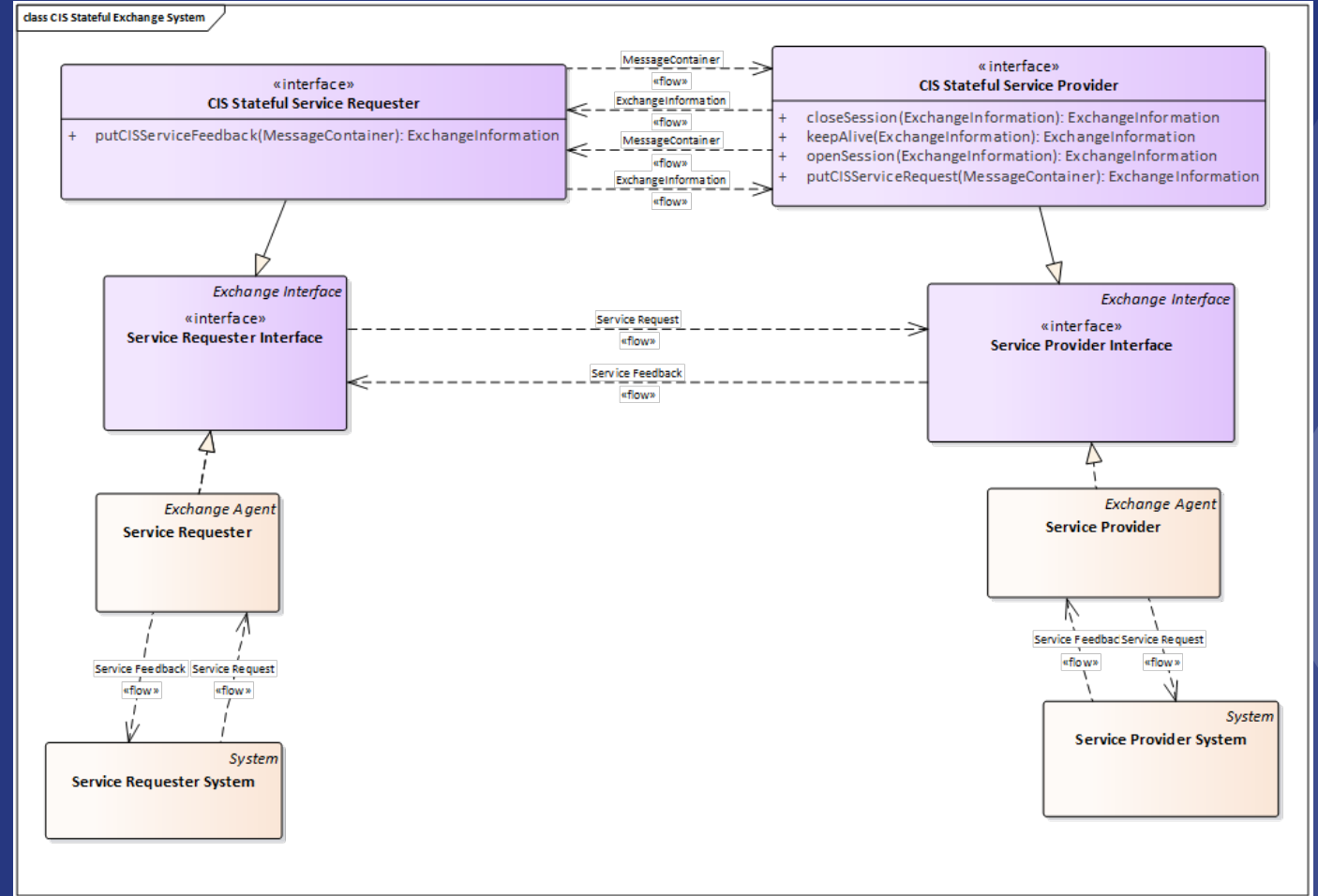


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Stateful CIS

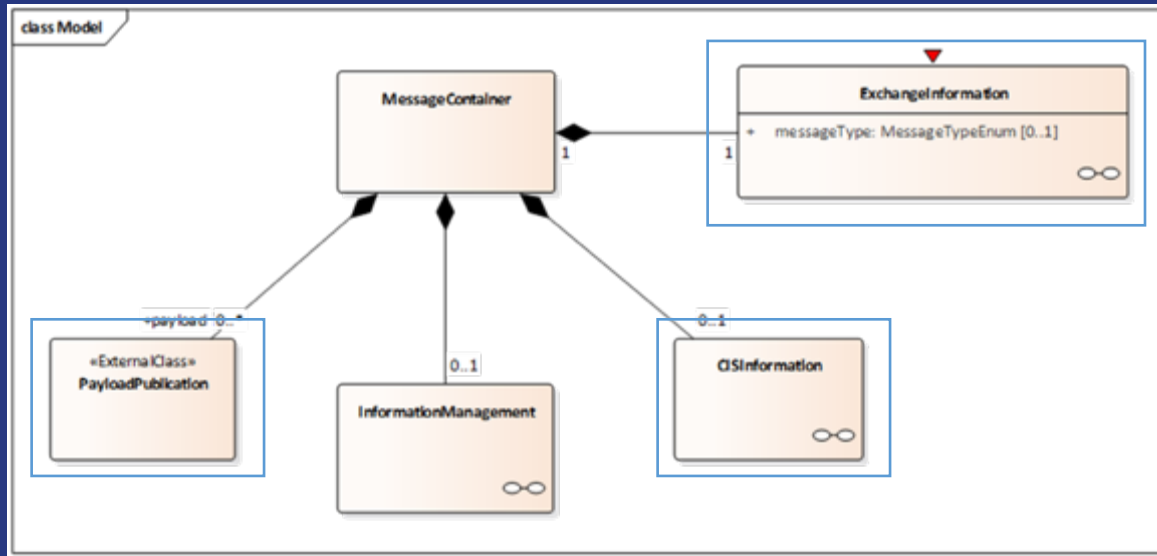
- Session managing and link monitoring are fully implemented
- Exchange status and feedback returned leads to specific management at Service Requester side.
- Further management actions are consequences of the status and feedback of all involved nodes.
 - Both for non preemptive and preemptive transactions



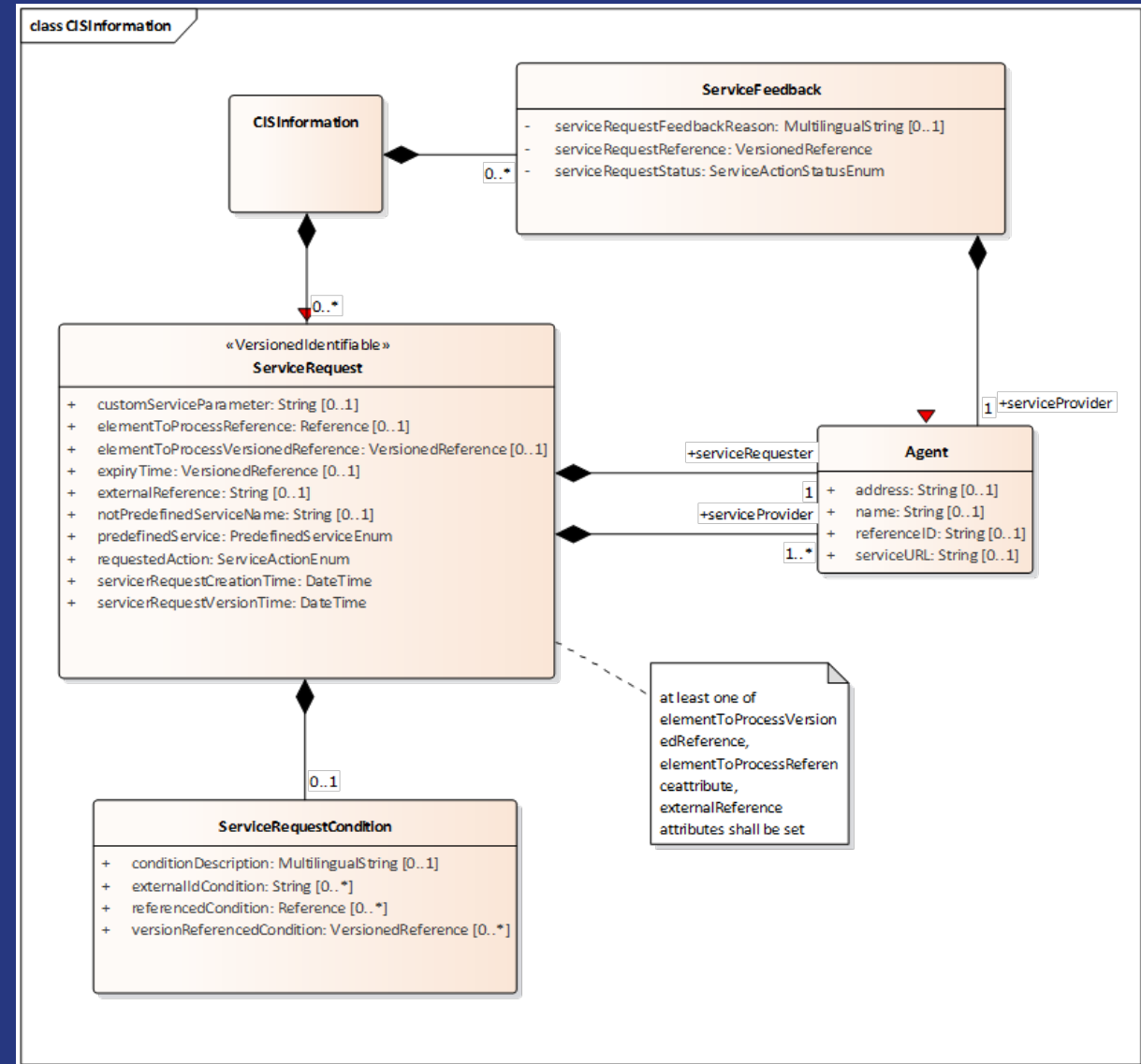
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CIS Information Data Model



- Service Request and Service Feedback information

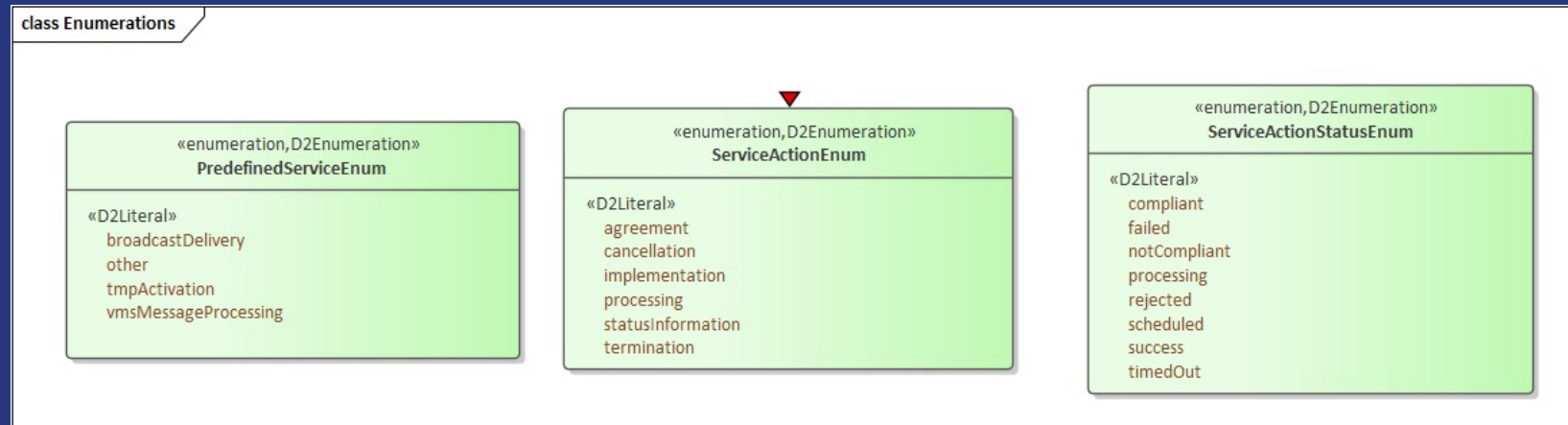


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Action, request, action status types



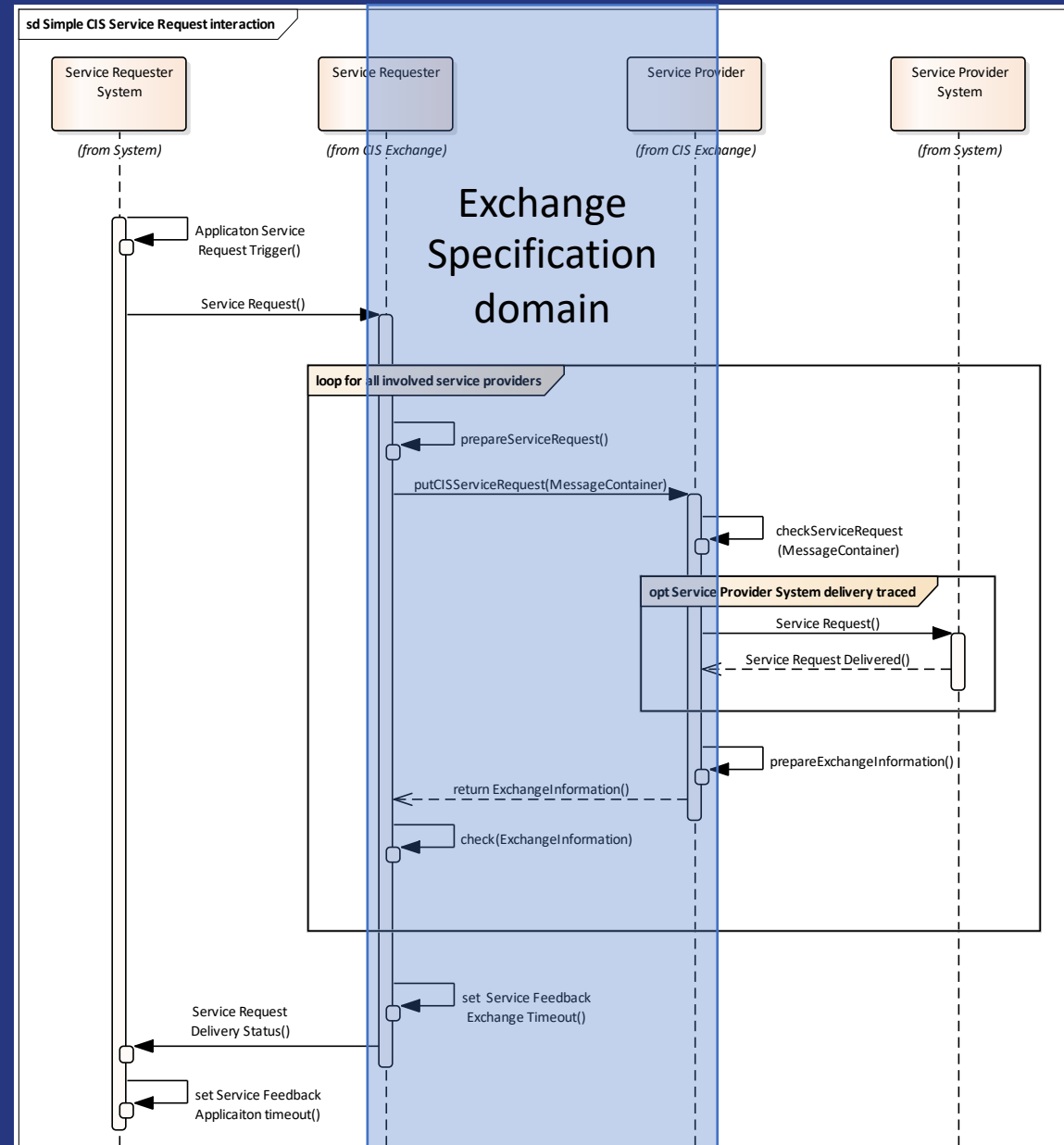
TMPlan Model

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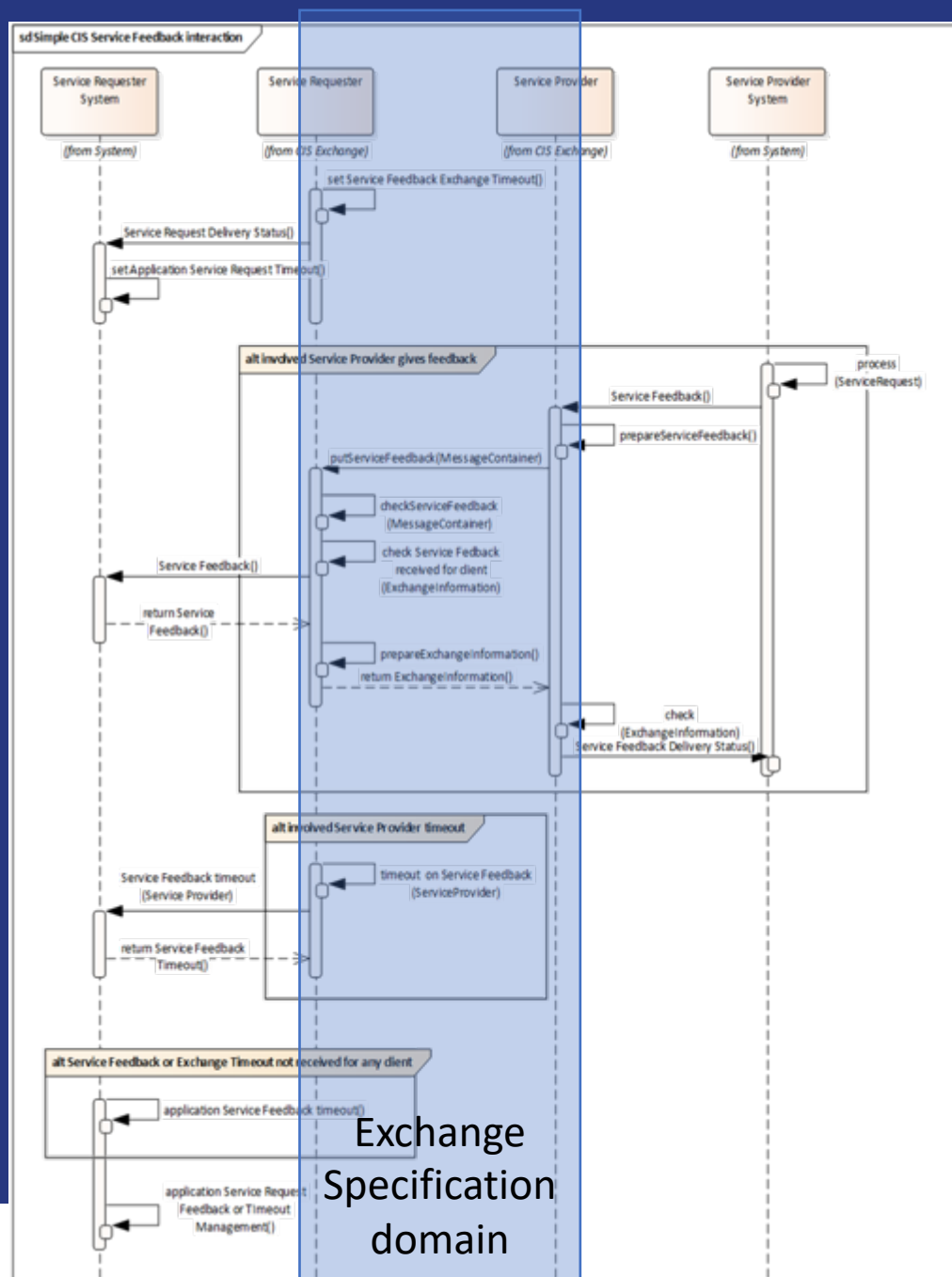
CIS Workflow Service Request

- Delivery from Service Requester to Service Provider
- Ack of correct reception from Service Provider
- Timeout management for ServiceFeedback delivery



CIS Workflow Service Feedback

- Delivery from Service Provider to Service Requester
- Ack of correct reception from Service Requester
- Timeout management for ServiceFeedback delivery at Exchange level
- Application level timeout also mentioned, application specific



TMPlan + CIS workplan

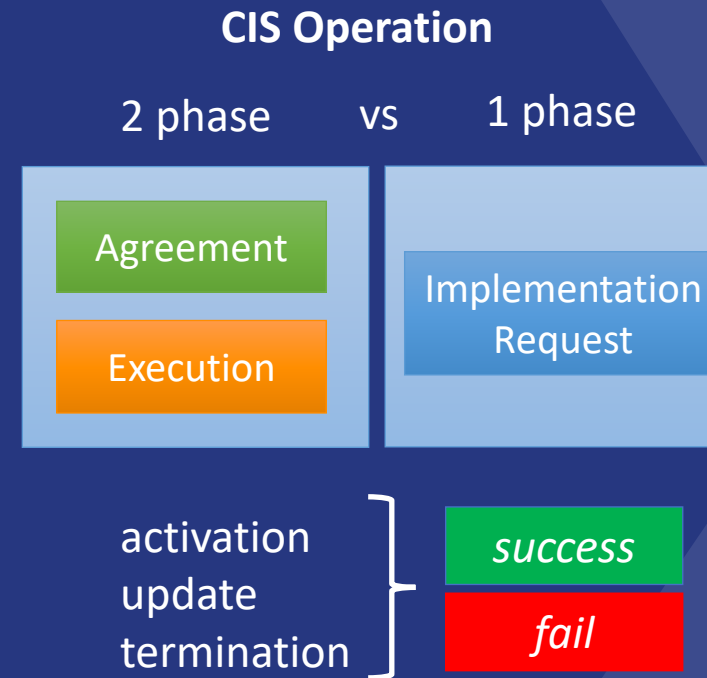
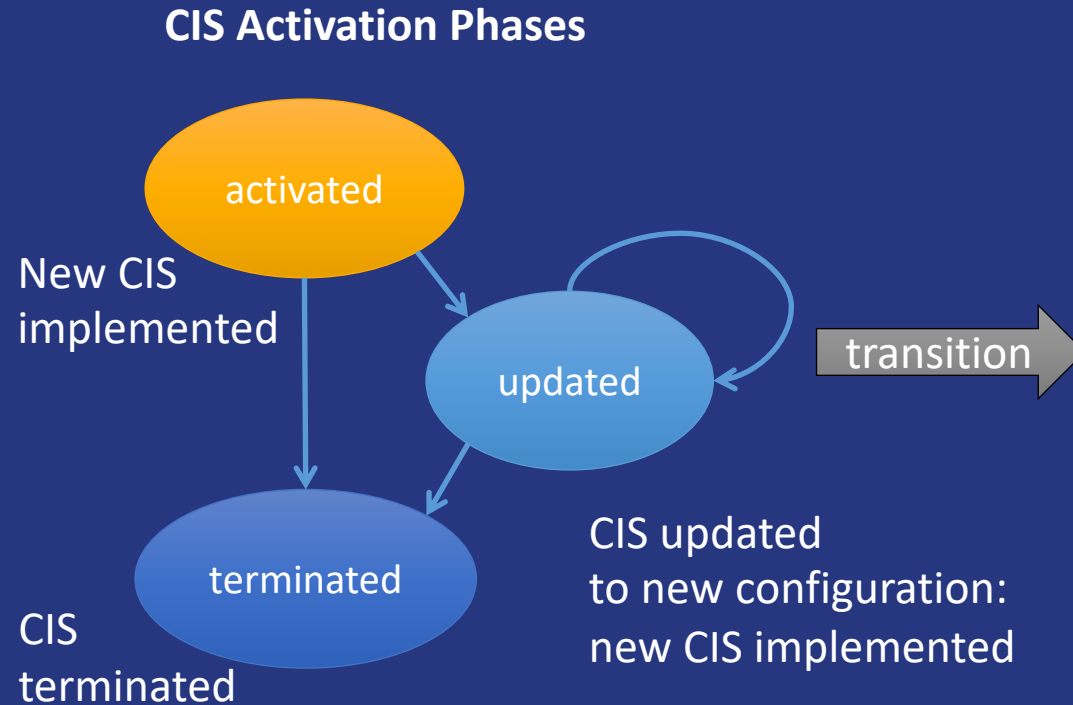
- CISServiceRequest
 - → MessageContainer
 - TMPlan Publication (optional)
 - CIS Information
 - **ServiceRequest**
 - ExchangeInformation
 - ← ExchangeInformation
- CISServiceFeedback
 - → MessageContainer
 - CISServiceInformation
 - **ServiceFeedback**
 - ExchangeInformation



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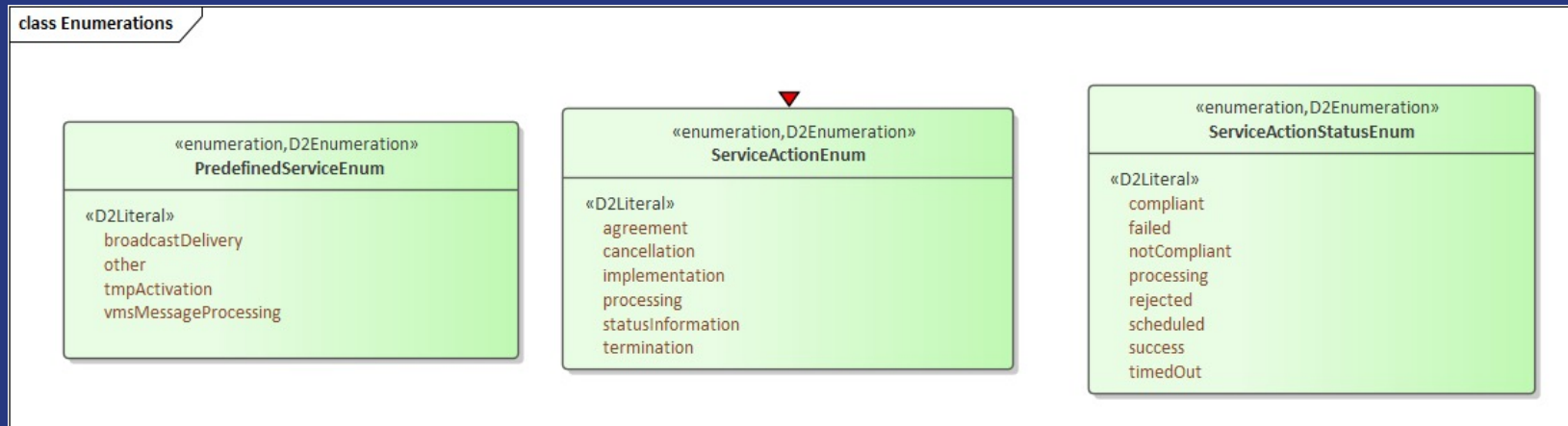
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CIS Operating and Lifecycle



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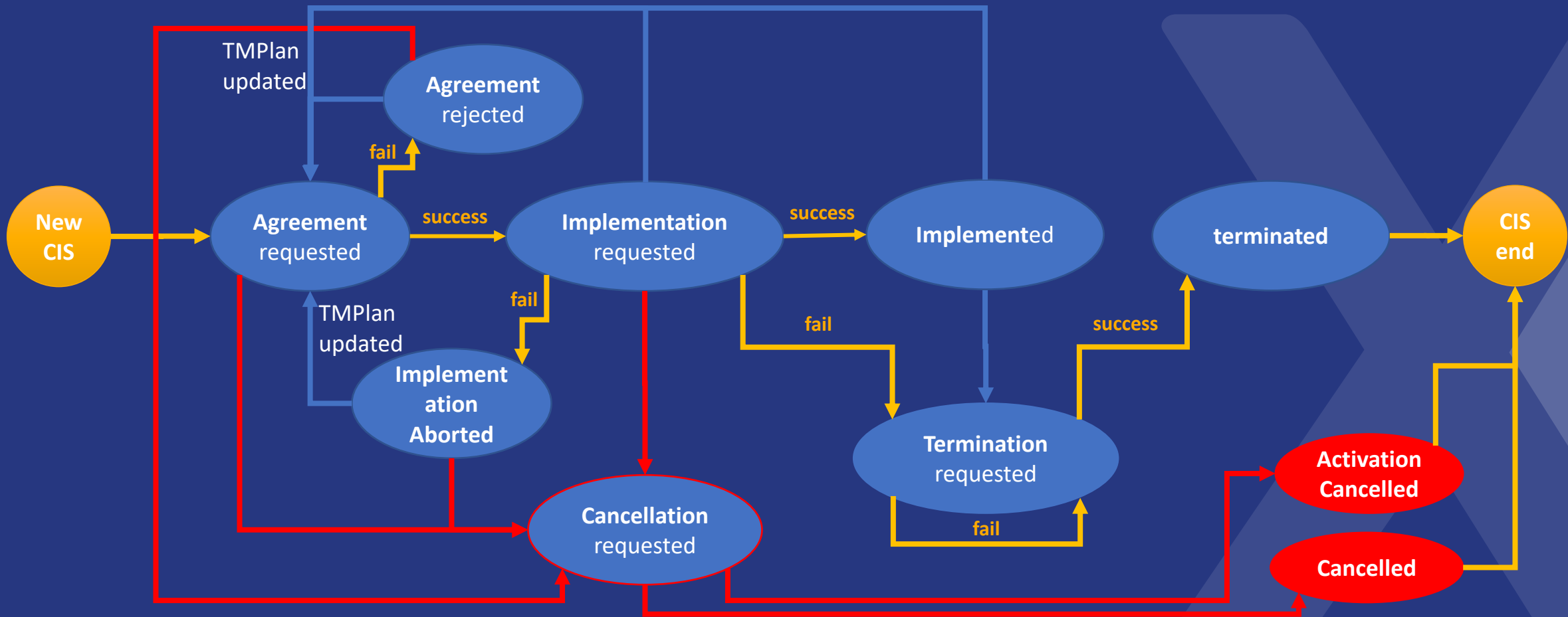
Action, request, action status types & TMPlan Operation Status



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TMPlan workflow: TMPlan operation status



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Implementing TMPlan Workflow recap

1. Exchange TMPlan Table for predefined TMPlan
2. Trigger TMPlan Operation activation:
 - Predefined TMPlan reference
 - On the Fly Operation description
3. CIS Exchange
 - a) Cycle
 1. *Send Agreement Request*
 2. *Manage overall agreement request feedback*
 3. Send Implementation Request
 4. Manage overall Implementation request feedback
 - b) Send Termination/Cancellation Request
 - c) Manage overall Termination/Cancellation request feedback

NOTE: Manage CIS activation status and TMPlan activation status accordingly

NOTE: Manage timeout, failed request, communication error by raising decision issues to be managed at TMC application level, either manually or by knowledge based rule decisions.

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