



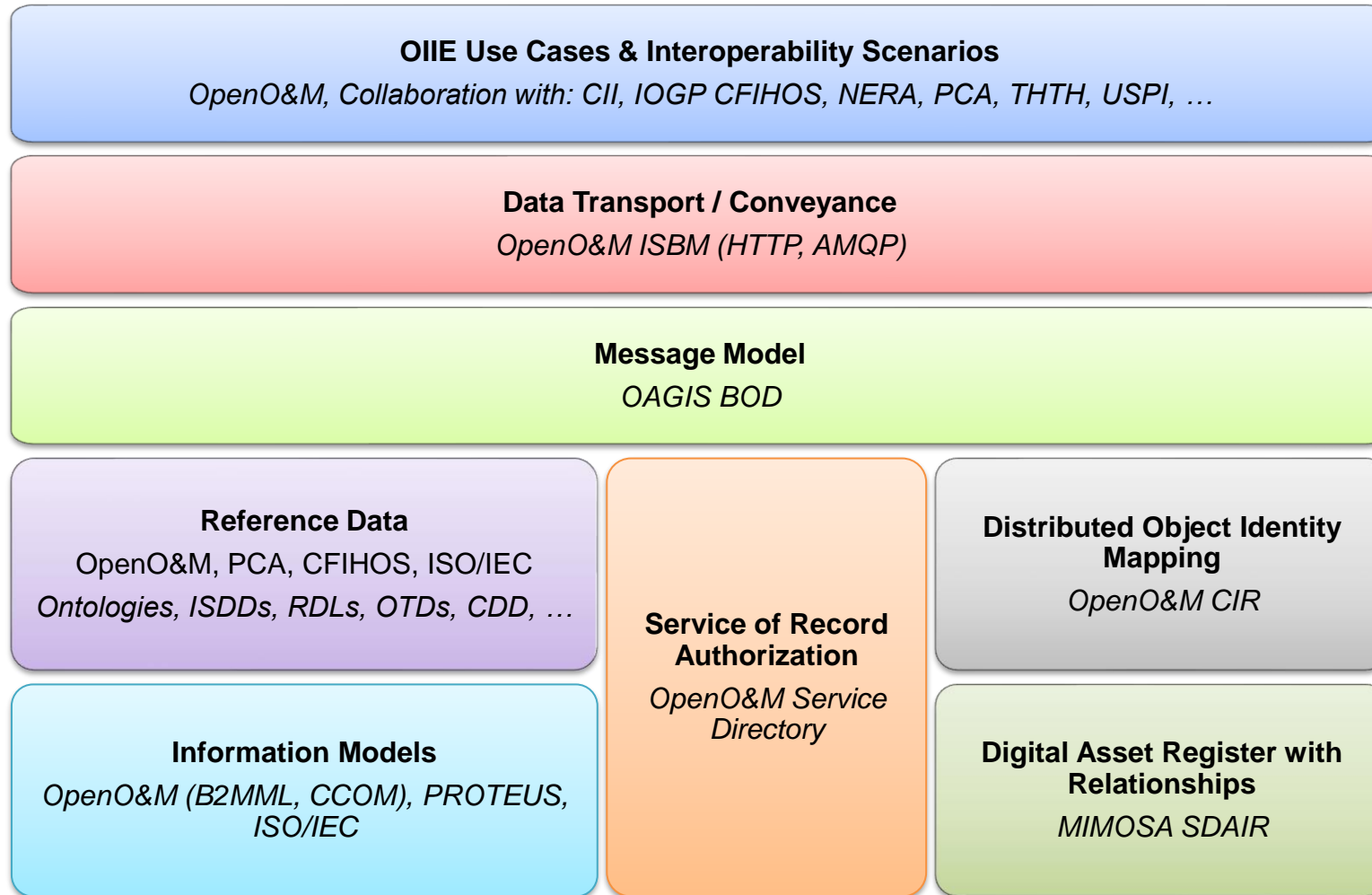
Open Standards for
Physical Asset Management

OIE Component Specifications

Brief Overview

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University of South Australia

OIE Components



OIE Component Specifications

ISBM



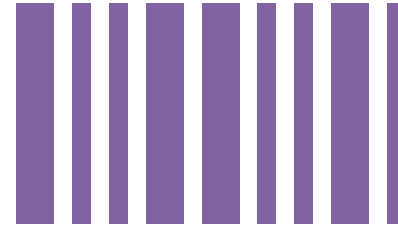
- Common Communication and Message Exchange Interfaces

Service Directory



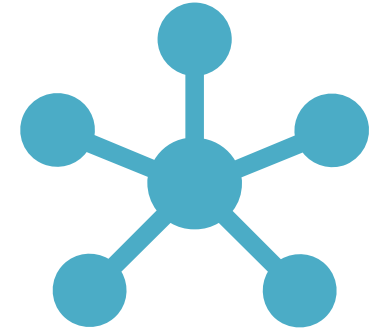
- Service Discovery and Configuration

CIR



- Object Identification, Mapping, and Translation

SDAIR



- Federation, Provenance, and Management of Change

OIIE Specification - ISBM

ISBM

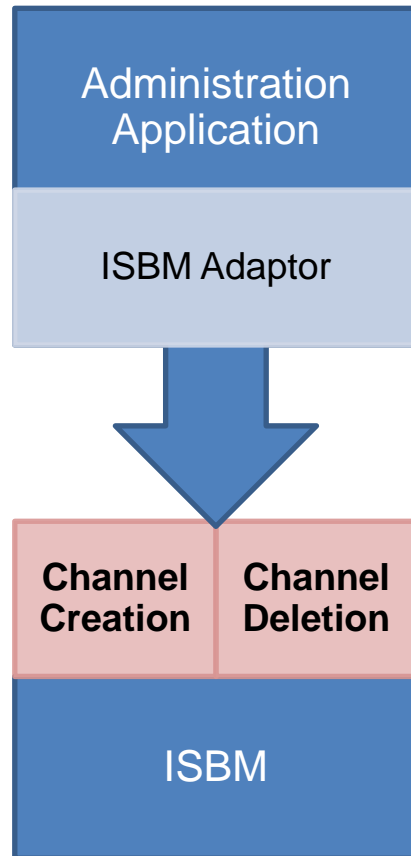


- Common Communication and Message Exchange Interfaces

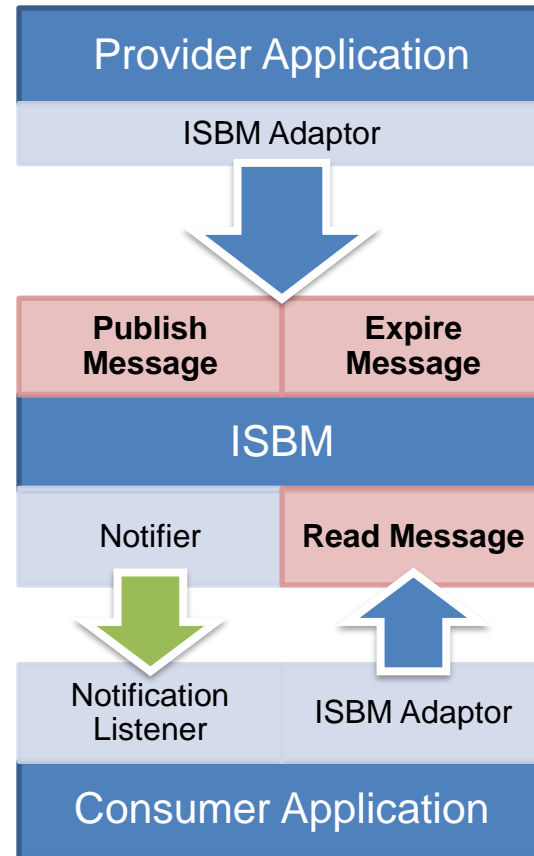
- **Connectivity Backbone of OIIE**
- Bi-directional alignment with ISA-95/IEC 62264 Part 6 MSM
- Defined as a subset of interfaces for ESBs to allow vendor neutral interfaces
- Service definitions support **publish-subscribe**, **request-response**, and push **notifications**
- **ISBM v2.0 SOAP and REST/JSON interfaces**

Primary ISBM Service Interfaces

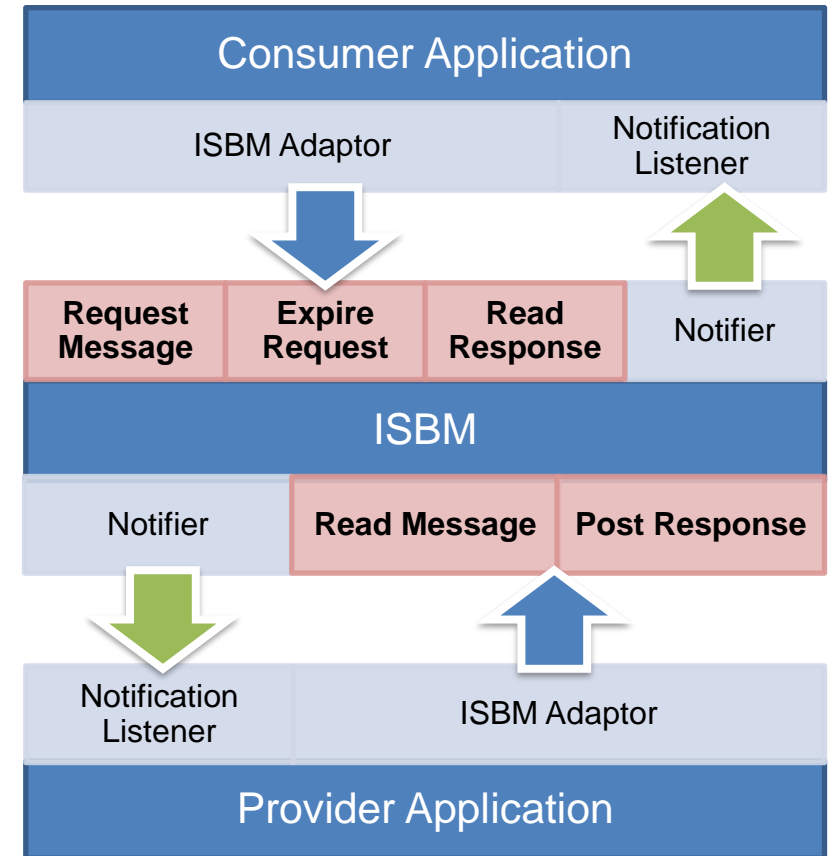
Channel Management



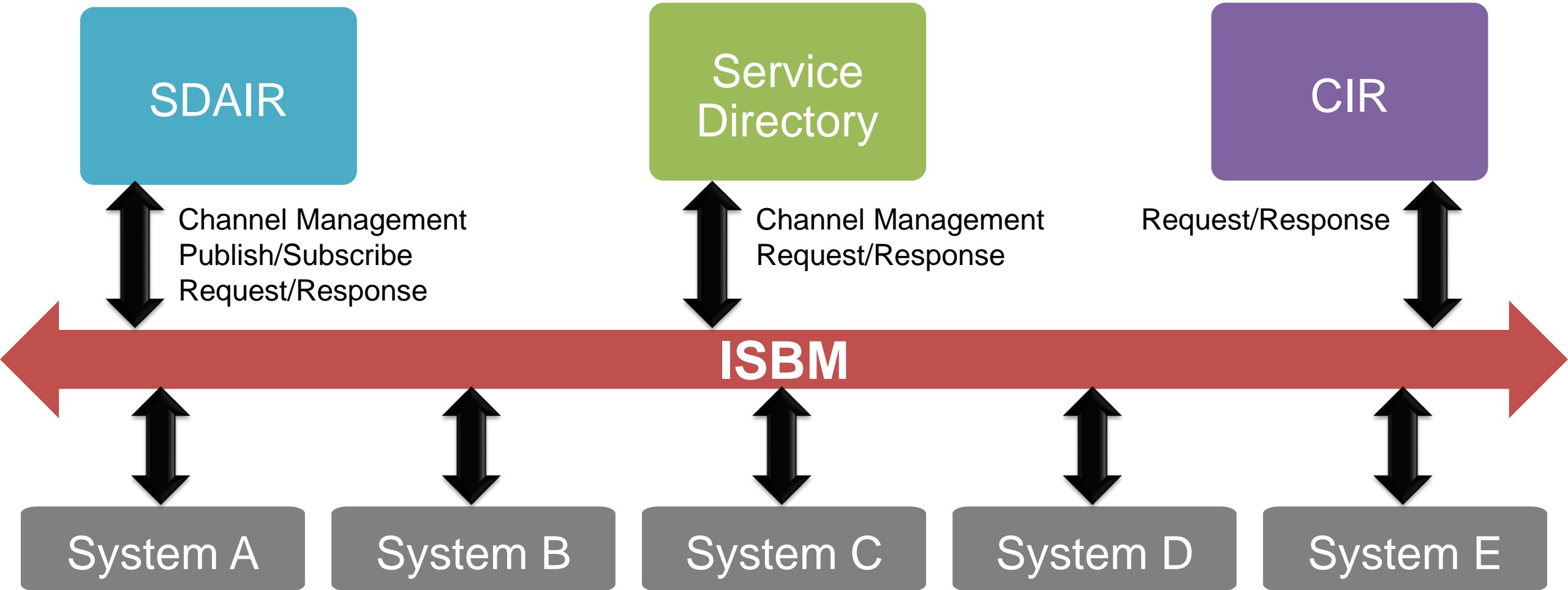
Publish/Subscribe (Notification optional)



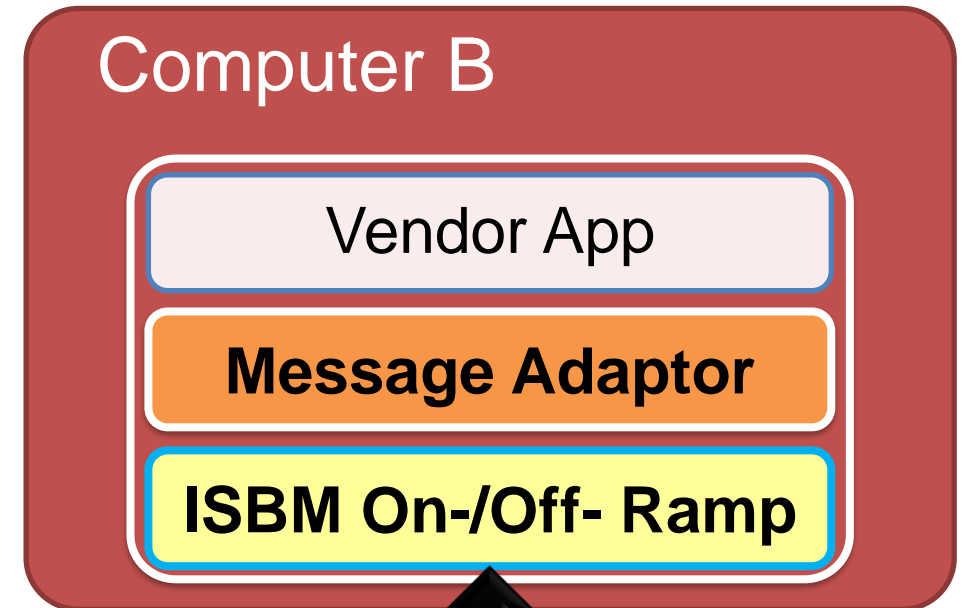
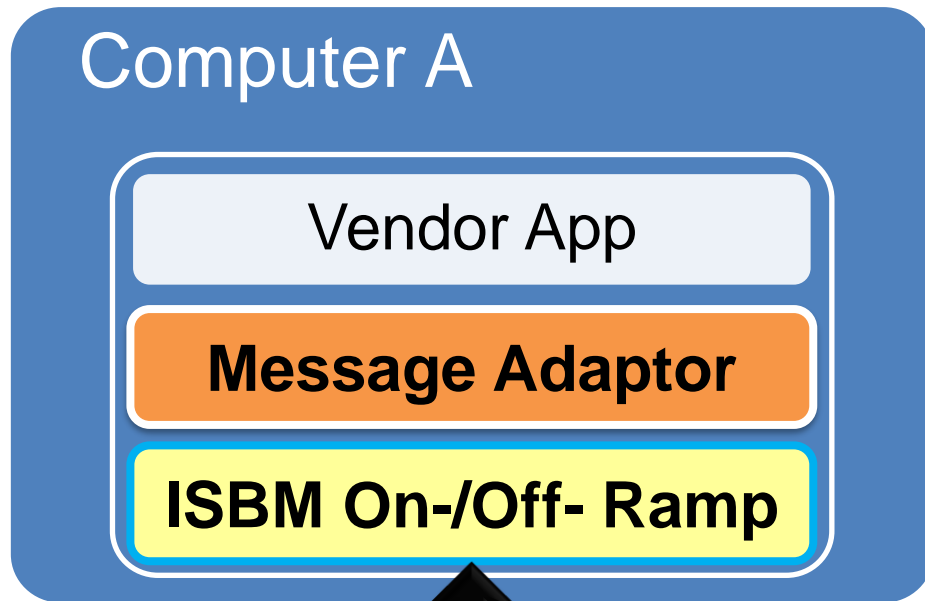
Request/Response (Notification optional)



OIE Component Specifications



OIE Adaptors



IEC 62264 Messaging Service Model /OpenO&M ISBM

A large yellow arrow with a blue outline points from right to left across the bottom of the diagram, containing the text 'IEC 62264 Messaging Service Model /OpenO&M ISBM'. Two thick black double-headed vertical arrows connect the bottom of each computer's ISBM layer to the top of this horizontal arrow.

OIIE Specification – Service Directory

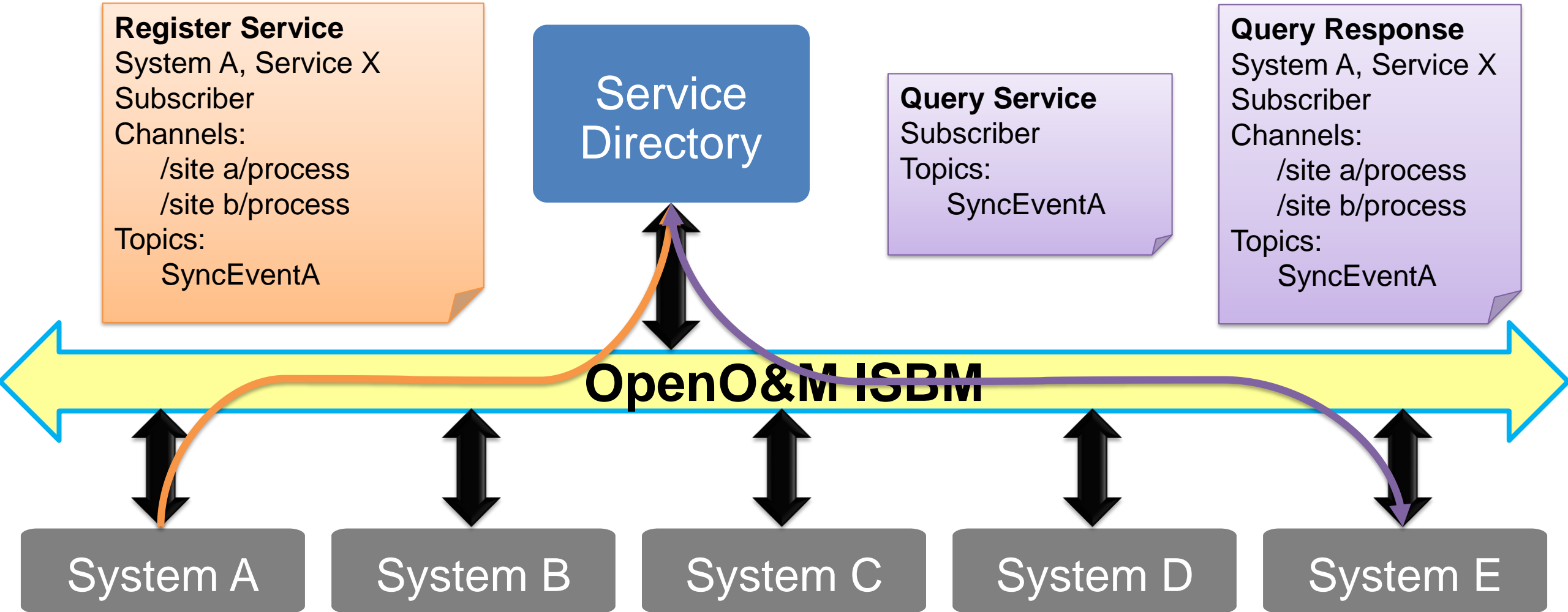
Service Directory



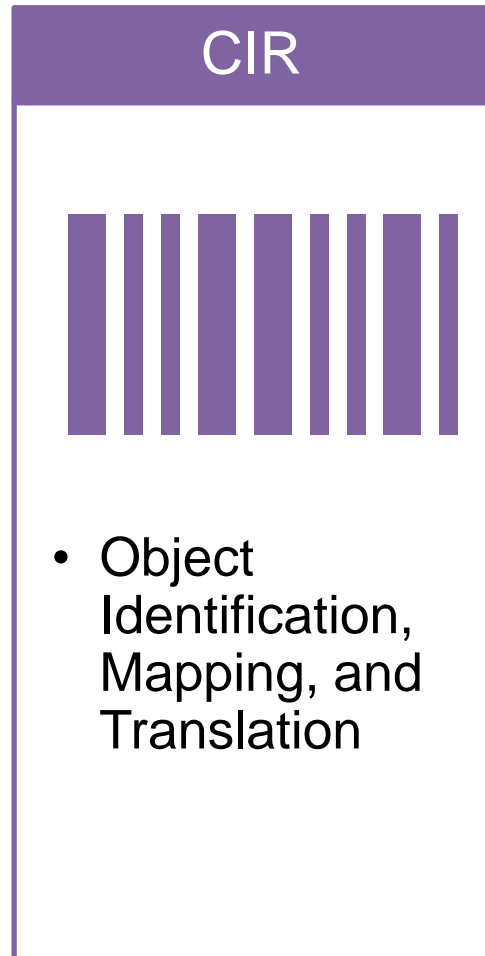
- Service Discovery and Configuration

- Configuration and Service Management, fundamentally:
 - Register services
 - Query services
 - Feedforward configuration to connected ISBM instances
- The “App Store” of OIIE instances
- Centralized management
- Holistic view of ecosystem configuration
- Designate SoR to applications

Service Directory Example

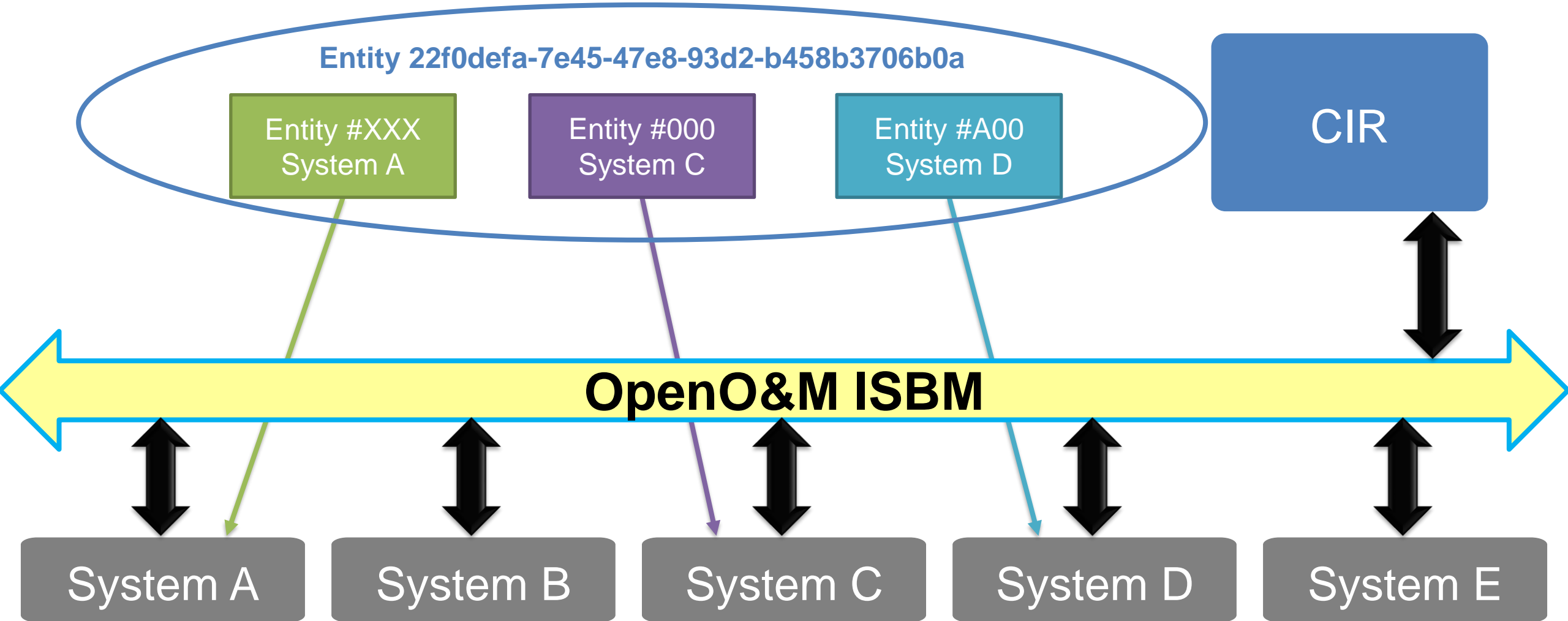


OIIE Specification – CIR



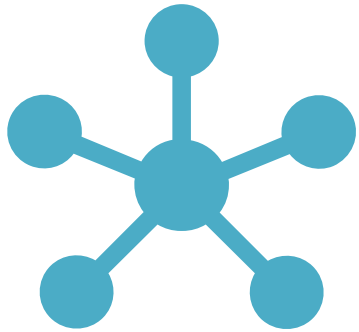
- Common Interoperability Registry
- Interfaces for:
 - Registering object identifiers
 - Mapping of “equivalent” object identifiers
 - Querying of “equivalent” object identifiers w.r.t. a specific context
- E.g., translating entity identifiers of internal identifiers into equivalent identifiers of a reference data set such as CFIHOS

OpenO&M CIR Example



OIIE Specification – SDAIR

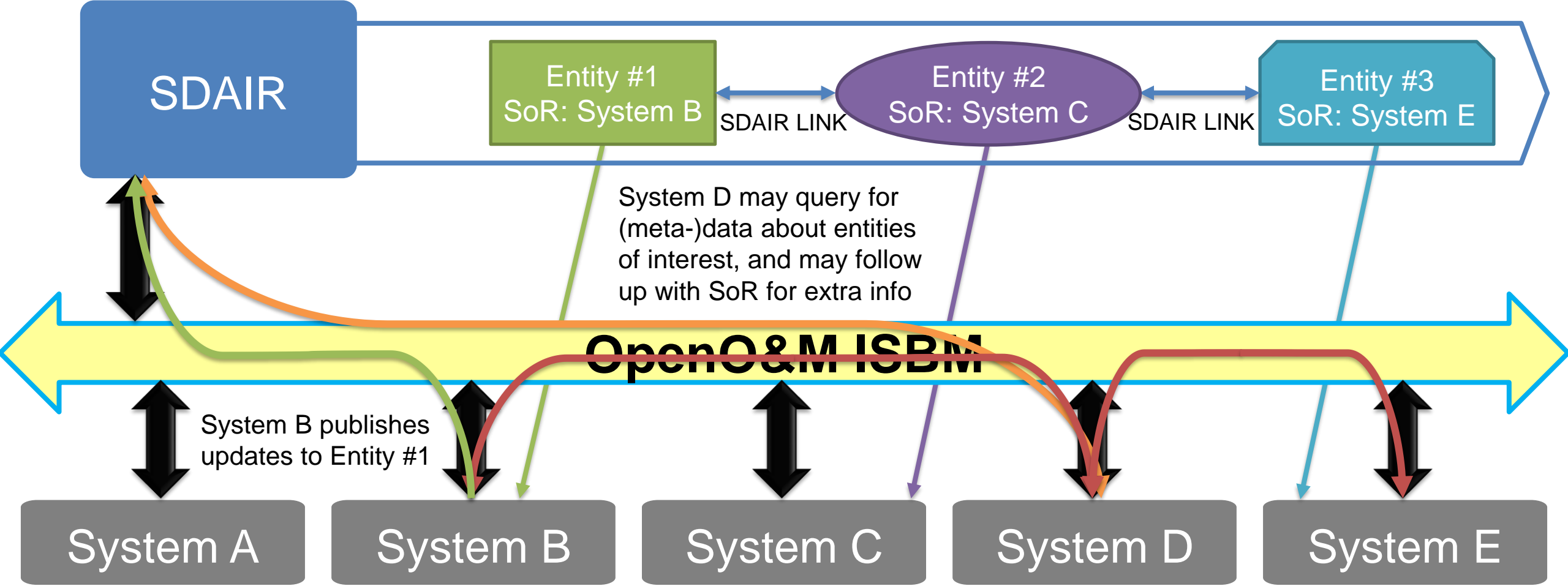
SDAIR



- Federation, Provenance, and Management of Change

- Structured Digital Asset Interoperability Register
- Provides federation capabilities
 - “Structured object graph”
- Provenance meta-data (e.g., System of Record)
- Management of Change

SDAIR Example



Bringing it all together

- Dynamically configuration by querying SDAIR and CIR services
- System register itself in the SDAIR as SoR, and register services in the Service Directory
- Registers local identifiers with CIR, when new entities are created
- Entity creation and updates registered by SDAIR
- SDAIR registers entities, referring back to the System, and maintains change history when receiving updates
- Other systems query (or listen to published info from) SDAIR and SoR (possibly by searching for services in Service Directory), resolving IDs through CIR as necessary

Bringing it all together: Guidelines

- System IDs in Service Directory should be registered in SDAIR
- SDAIR entity UUIDs should be used as the core identifier in CIR
- CIR system names resolve against registered systems in SDAIR

Resources

- Getting starting guide – <https://www.mimosa.org/wp-content/uploads/2021/01/MIMOSA-Getting-Started-Guide.pdf>
- OIIE – <https://www.mimosa.org/open-industrial-interoperability-ecosystem-oiie/>
- OpenO&M ISBM – <http://www.openoandm.org/isbm/>
- OpenO&M Service Directory – http://www.openoandm.org/files/standards/Service_Directory_1.0.pdf
- OpenO&M CIR – <http://www.openoandm.org/ws-cir/1.0/ws-cir.html>
- SDAIR – <https://www.mimosa.org/mimosa-sdair-draft/>