Architecture

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Role of the Industrial Internet Consortium

Vision: *The Industrial Internet Consortium is the world's leading organization transforming business and society by accelerating the Industrial Internet of Things (IIoT).*

Mission: *To deliver a trustworthy IIoT in which the world's systems and devices are securely connected and controlled to deliver transformational outcomes.*

Over 260 Member Organizations Spanning 30 Countries

Launched in March 2014 by five founders:

at&t   CISCO   GE   IBM   intel

Supported by 5 contributing members:

BOSCH   DELL   HUAWEI   SAP   Schneider Electric

And 250 plus general members from large industry to academia

Overview
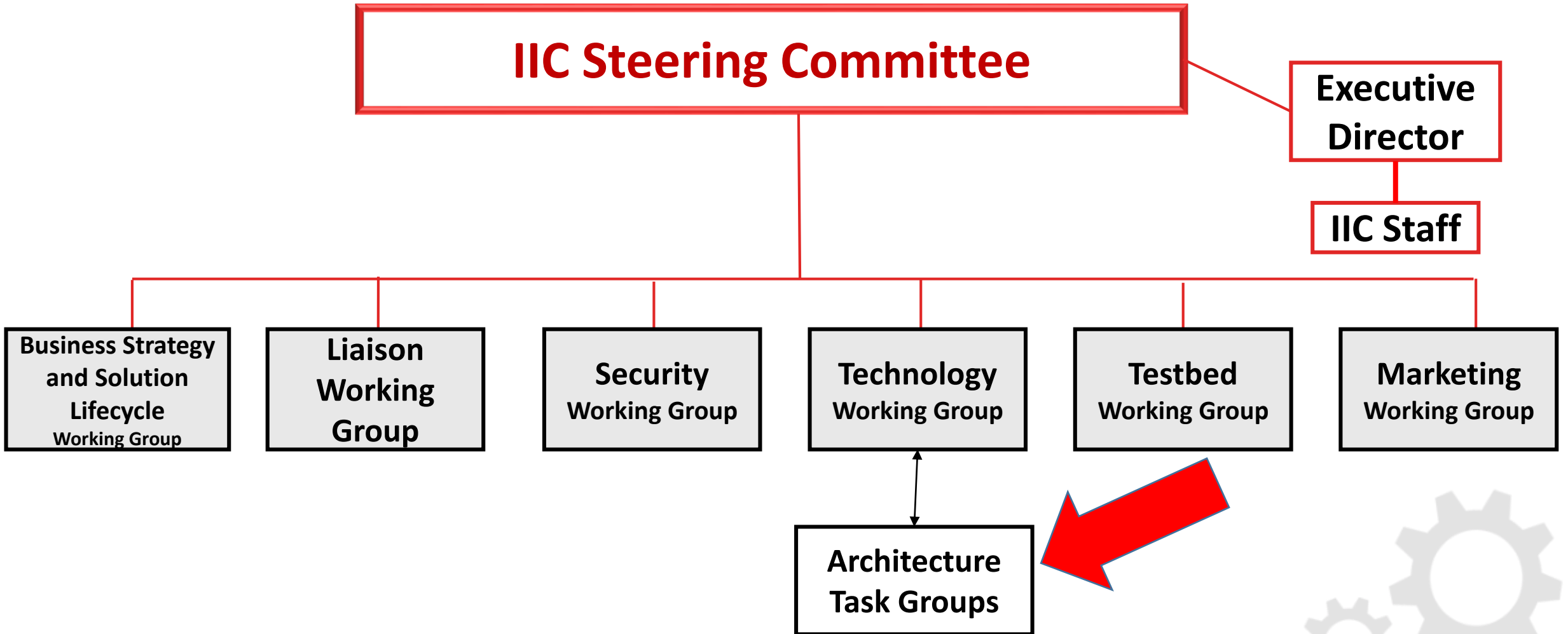
IIC Architecture Task Group Mission

The Architecture Task Group is responsible for the creation, evolution and adoption of the Industrial Internet Reference Architecture (IIRA) and its supporting materials to ***enable open and interoperable IIoT technologies***
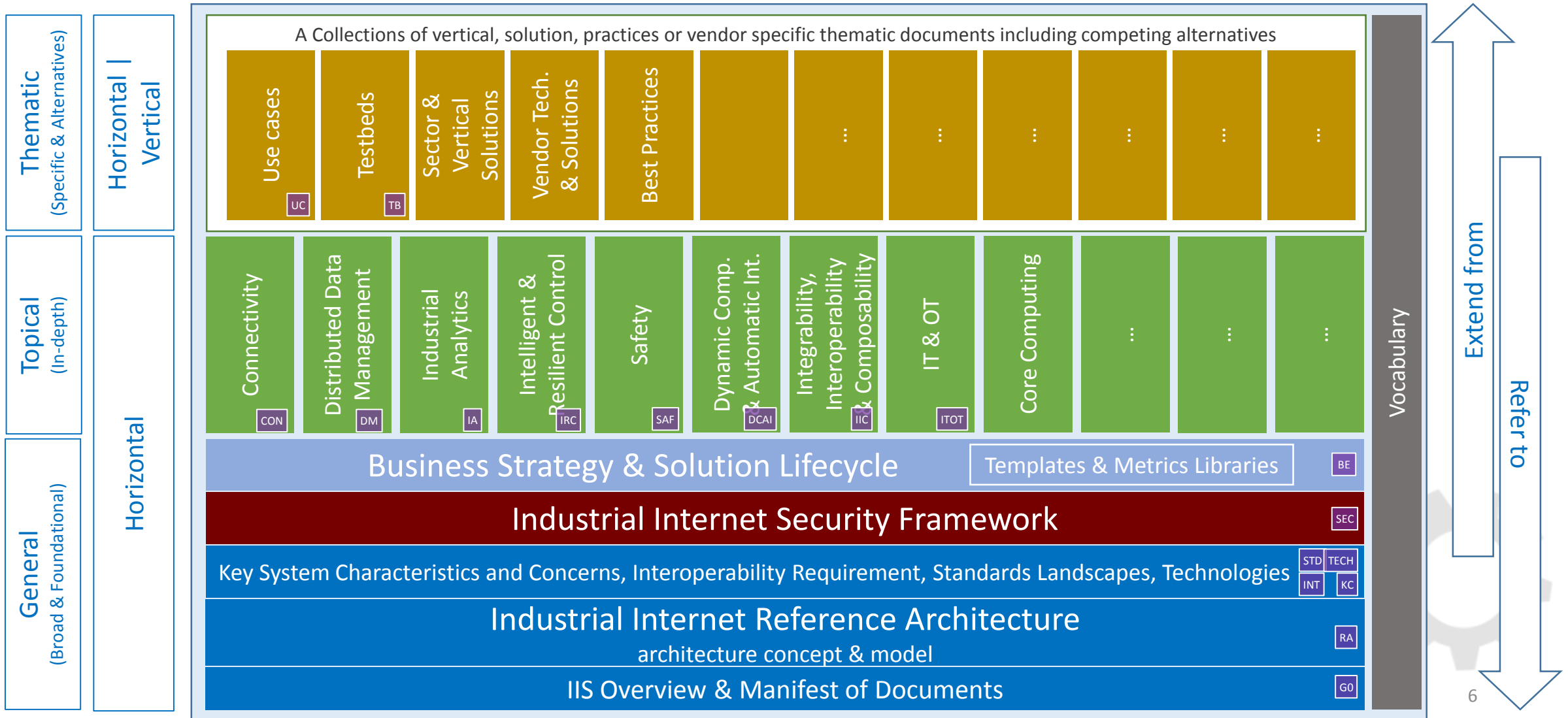
IIC Architecture Task Group Scope

- Identify and document major IIoT architecture concerns and develop systematic ***architecture frameworks and methodologies*** for their resolution;

- Identify and elaborate ***common IIoT architecture patterns***

- Identify and evaluate standards, practices, and technologies best suited for building IIoT systems, and highlight gaps where needed.

- Identify and document architecture elements and development activities that guide the realization and evaluation of IIoT key system characteristics.

- ***Engage with testbed teams and other adopters*** to leverage IIRA successfully and incorporate their feedback into future versions.

- Manage the author and publication lifecycle of the IIRA, and coordinate with other teams to ***ensure consistency*** between IIRA and other related artifacts in both structure and content.

IIC Industrial Internet of Things Deliverables

A Collections of vertical, solution, practices or vendor specific thematic documents including competing alternatives

Thematic (Specific & Alternatives) — Horizontal | Vertical

- Use cases (UC)
- Testbeds (TB)
- Sector & Vertical Solutions
- Vendor Tech. & Solutions
- Best Practices
- …

Topical (In-depth) — Horizontal

- Connectivity (CON)
- Distributed Data Management (DM)
- Industrial Analytics (IA)
- Intelligent & Resilient Control (IRC)
- Safety (SAF)
- Dynamic Comp. & Automatic Int. (DCAI)
- Integrability, Interoperability & Composability (IIC)
- IT & OT (ITOT)
- Core Computing
- …

General (Broad & Foundational) — Horizontal

- Business Strategy & Solution Lifecycle | Templates & Metrics Libraries (BE)
- Industrial Internet Security Framework (SEC)
- Key System Characteristics and Concerns, Interoperability Requirement, Standards Landscapes, Technologies (STD, TECH, INT, KC)
- Industrial Internet Reference Architecture — architecture concept & model (RA)
- IIS Overview & Manifest of Documents (G0)

Vocabulary

Extend from

Refer to

What the RA is – and is not
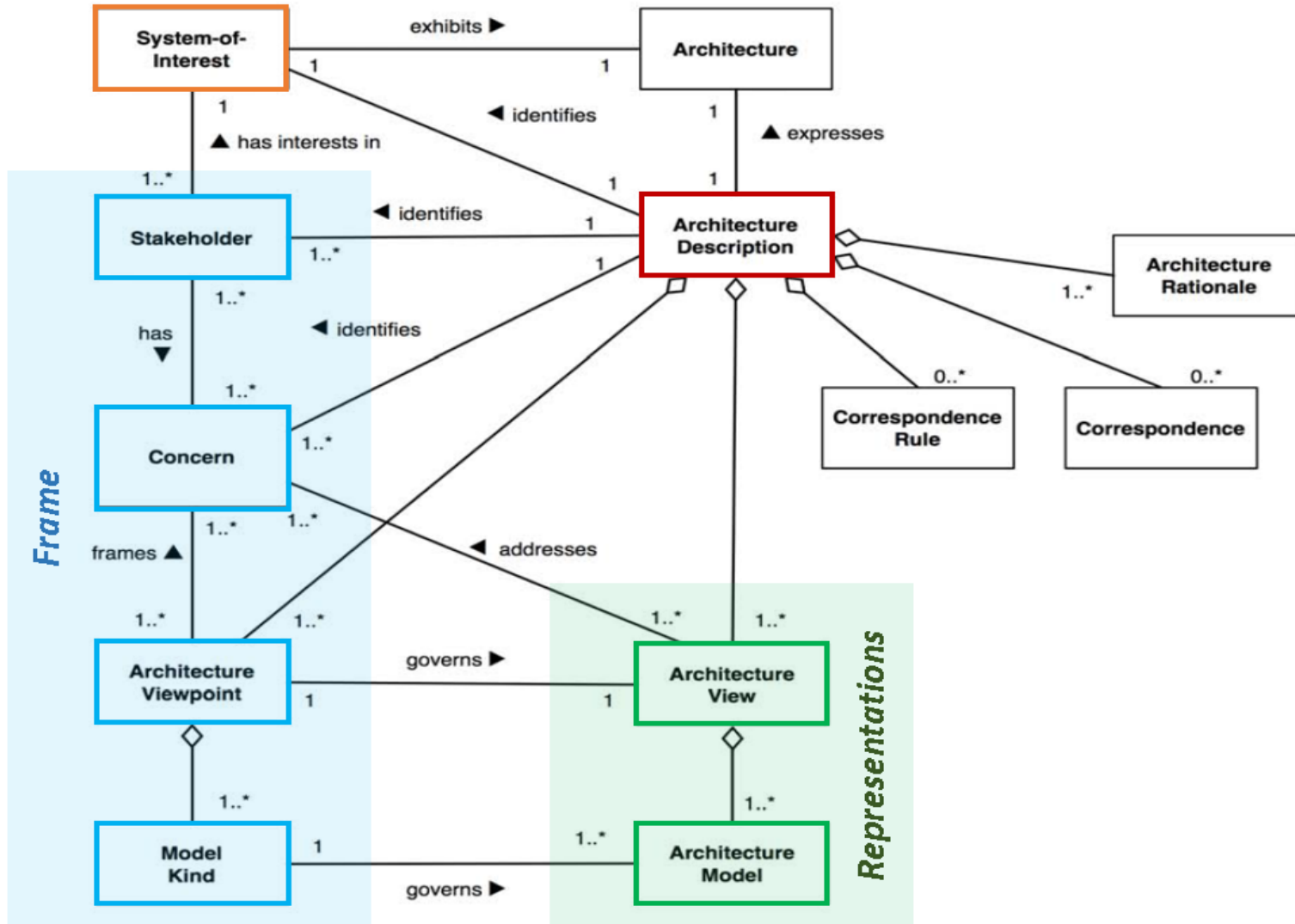
What it is not:

An Architecture

What it is:

A methodology that enables system architects to use standards based common approaches, common vocabularies, and common representations to design an optimal, interoperable IIoT system for their unique requirements.
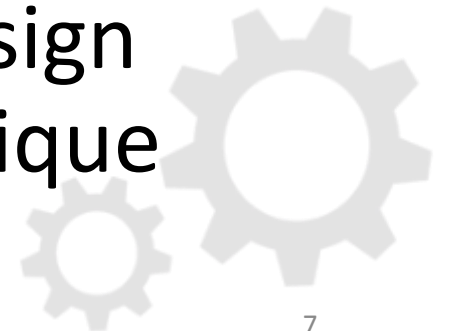
Basis: ISO/IEC/IEEE 42010:2011 – Systems & Software Engineering -- Architecture Description
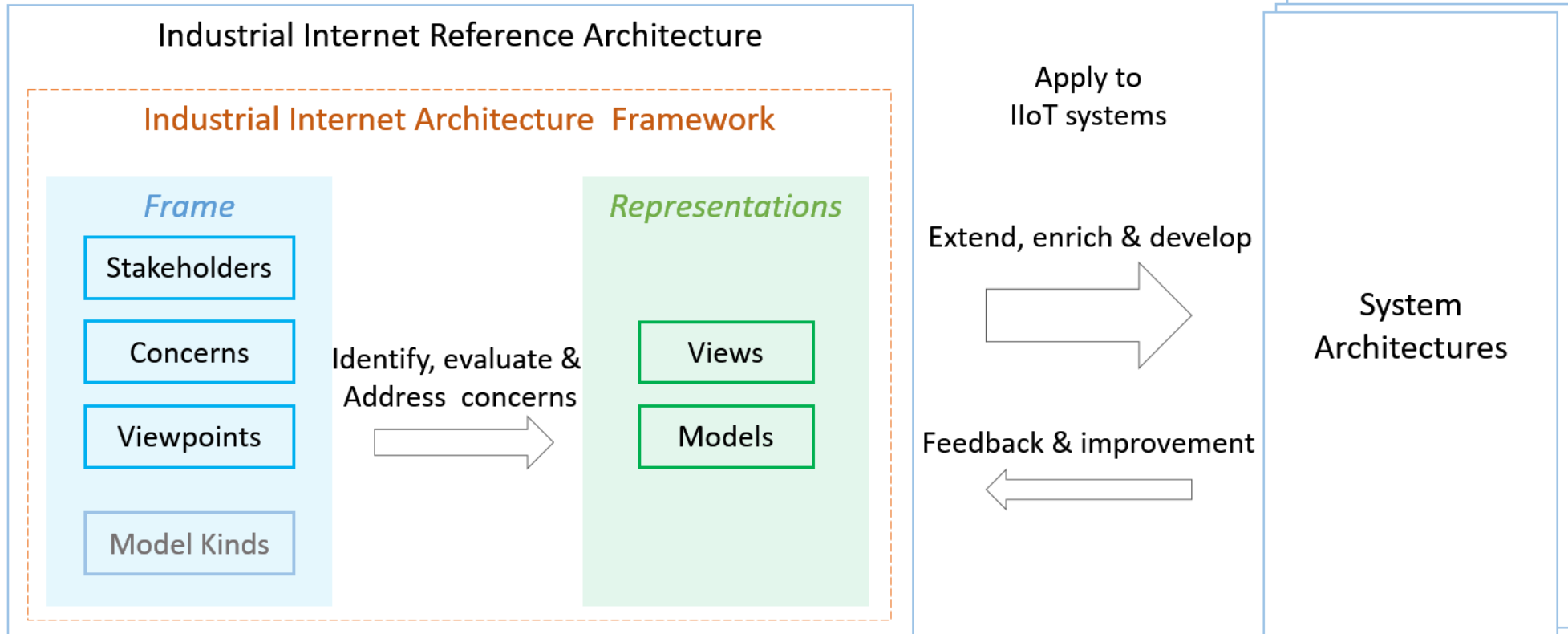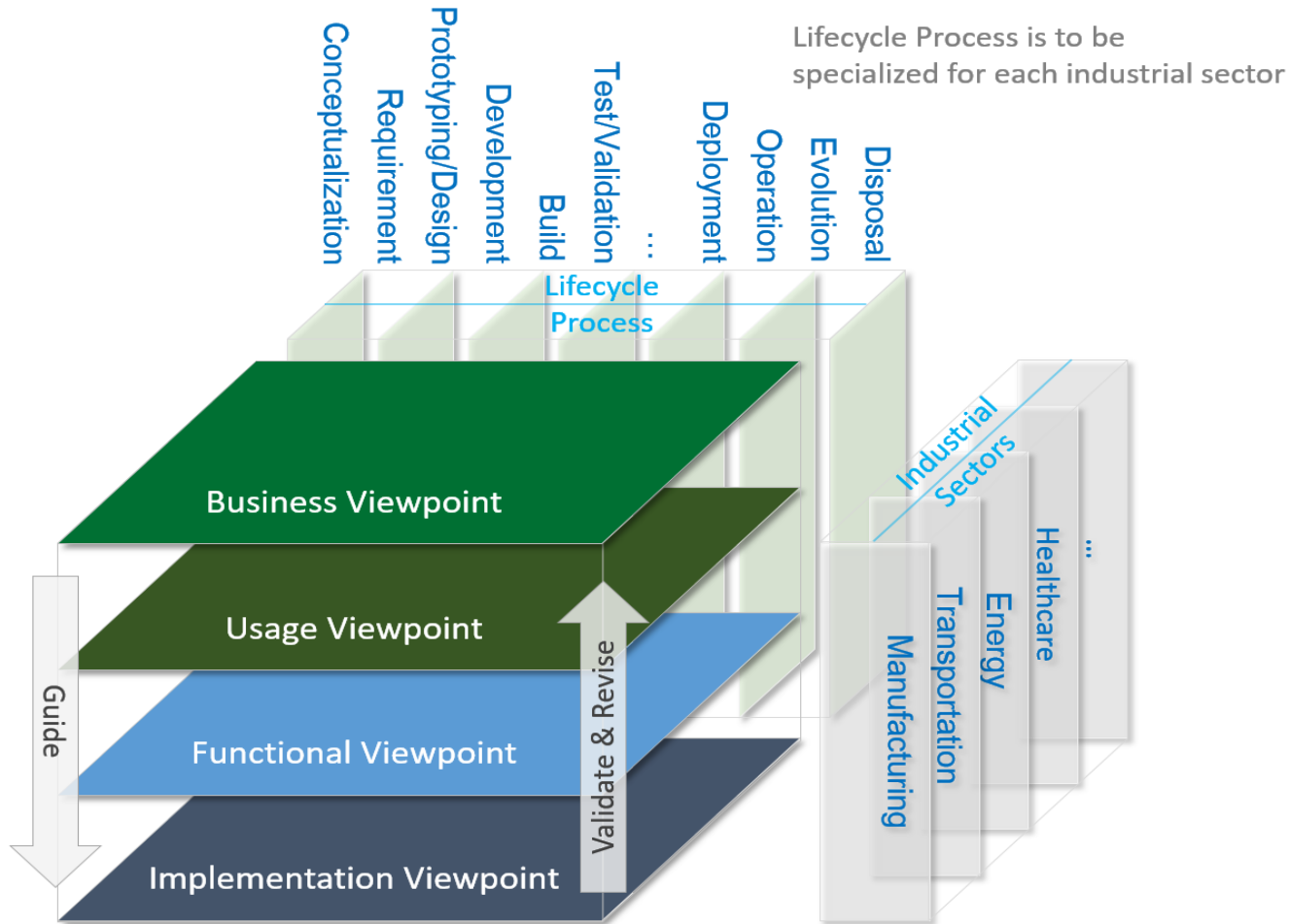

The IIRA leverages ISO 42010

IIRA and IIAF – Design, Build, Deploy & Feedback

Industrial Internet Reference Architecture

Industrial Internet Architecture Framework

Frame
- Stakeholders
- Concerns
- Viewpoints
- Model Kinds

Identify, evaluate & Address concerns

Representations
- Views
- Models

Apply to IIoT systems

Extend, enrich & develop

Feedback & improvement

System Architectures

The IIC IIoT Architecture Framework

- Viewpoints address specific stakeholder requirements
- Viewpoints are sequential
- Viewpoints are multidirectional
- Viewpoints address Lifecycle process
- Viewpoints enable view creation regardless of industrial sector
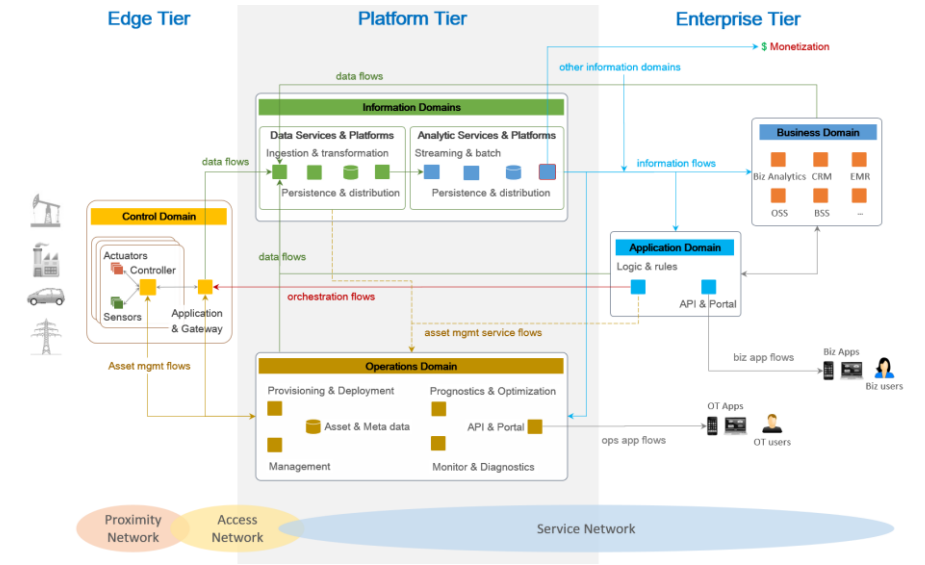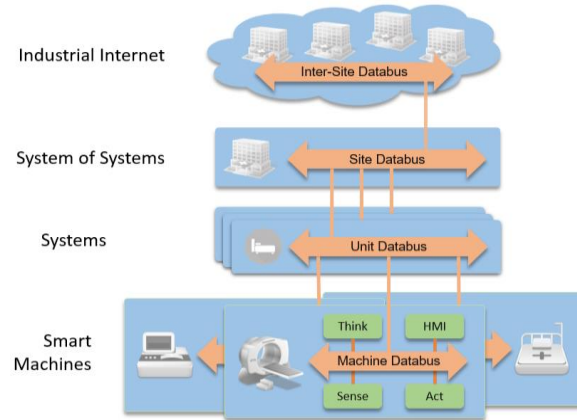
Functional View – Domains and Cross Cutting Functions

A *functional domain* is a (mostly) distinct functionality in the overall IIoT system

IIRA Functional View defines Five Domains – Control, Operations, Information, Application, Business

Additional functions must be provided to enable the major system functions
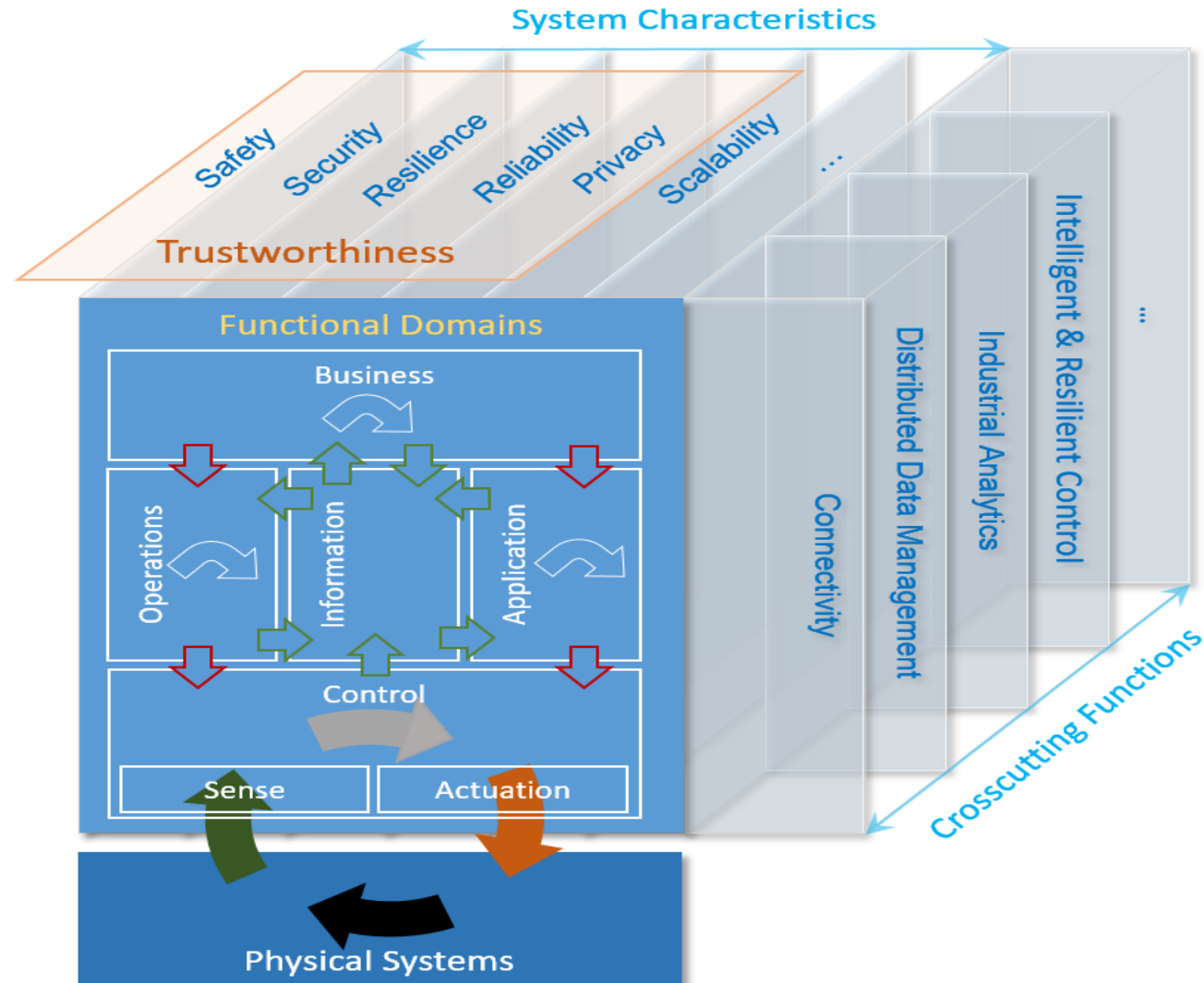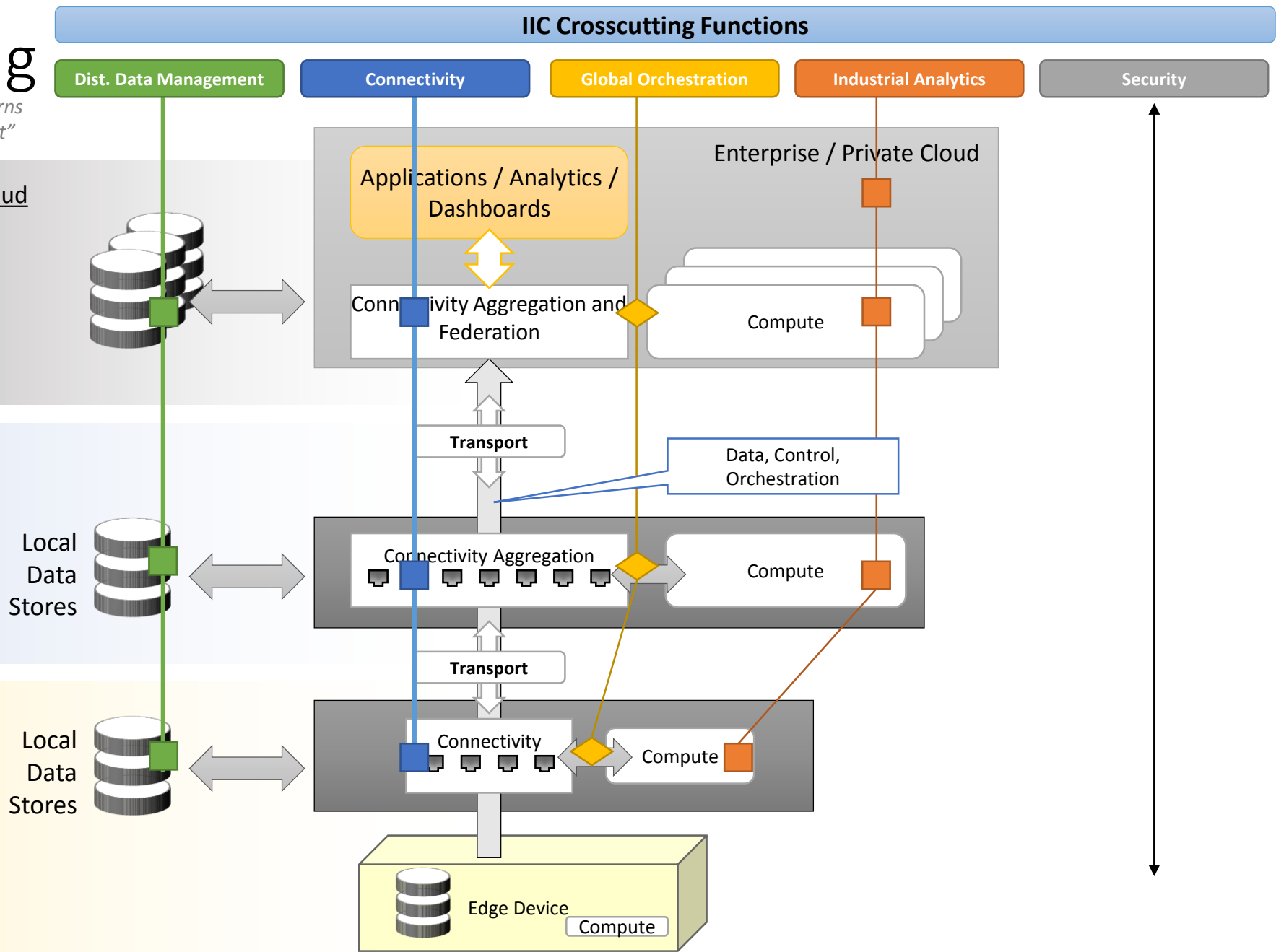
Architecture Patterns
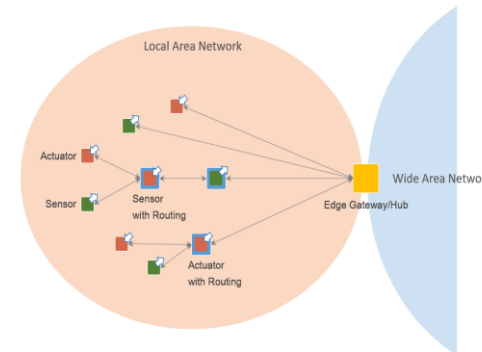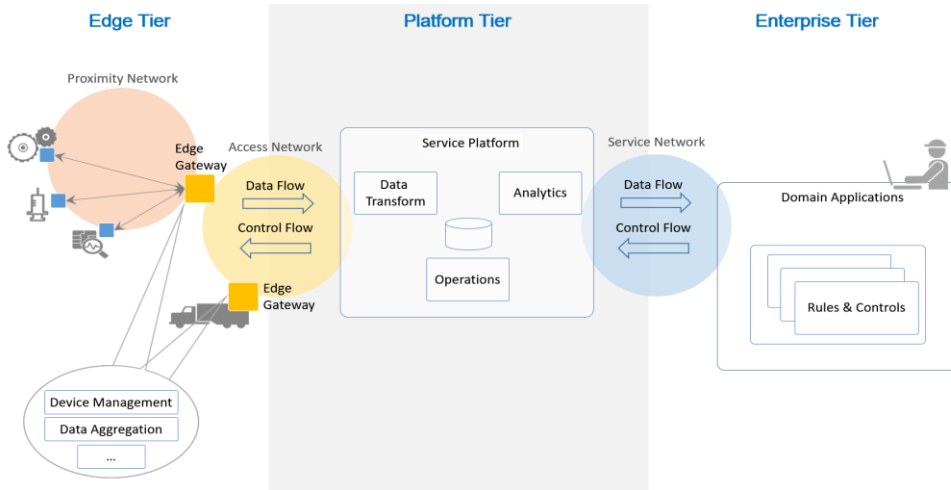
IIC Crosscutting

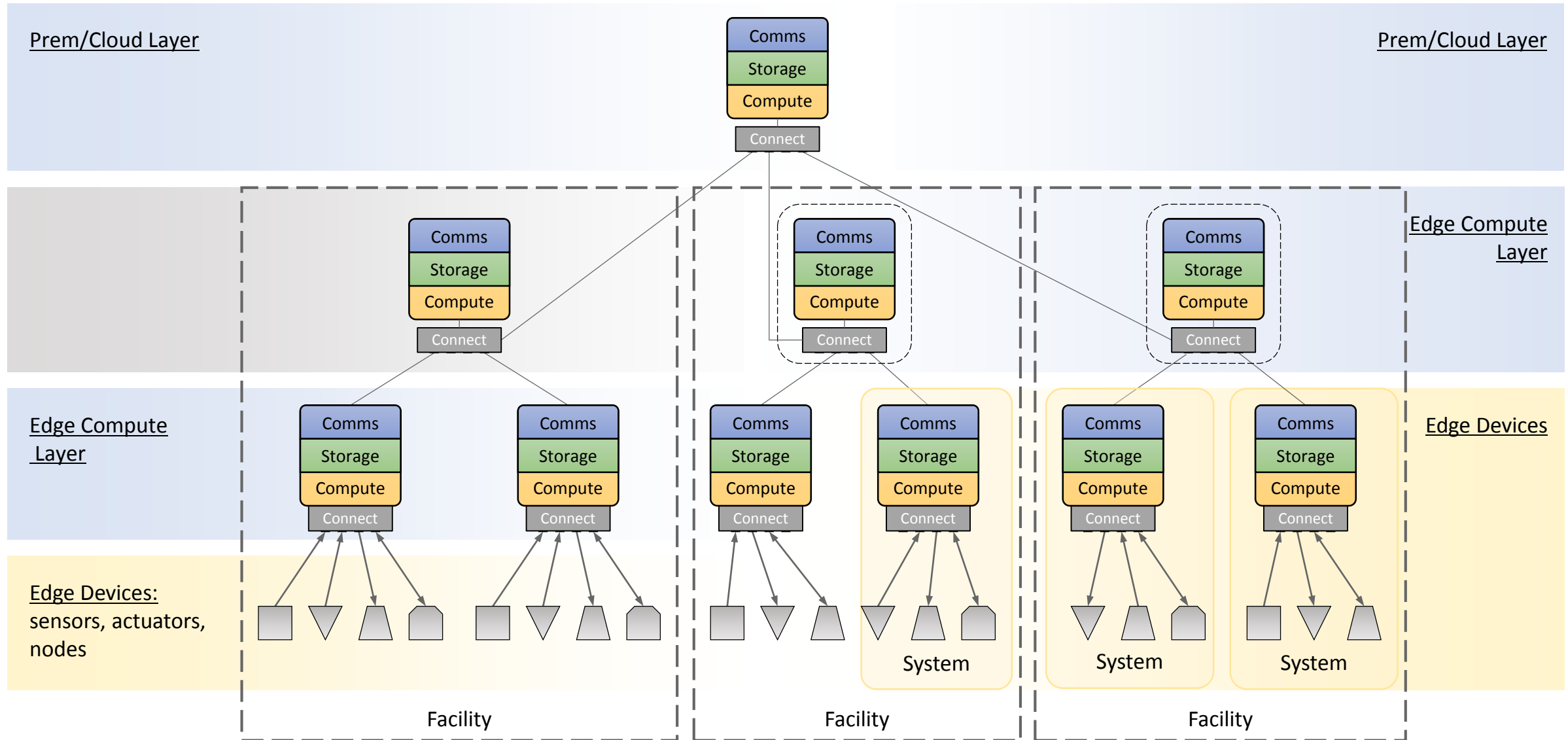*"Identify deployment models that address patterns and characteristics for IIoT Compute Deployment"*

Edge/Edge Computing Definition Diagram

Thanks

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