Architecture

Mark Crawford & Shi-Wan Lin
Co-Chairs IIC TWG Architecture Task Group

June 19 2017

www.iiconsortium.org

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***
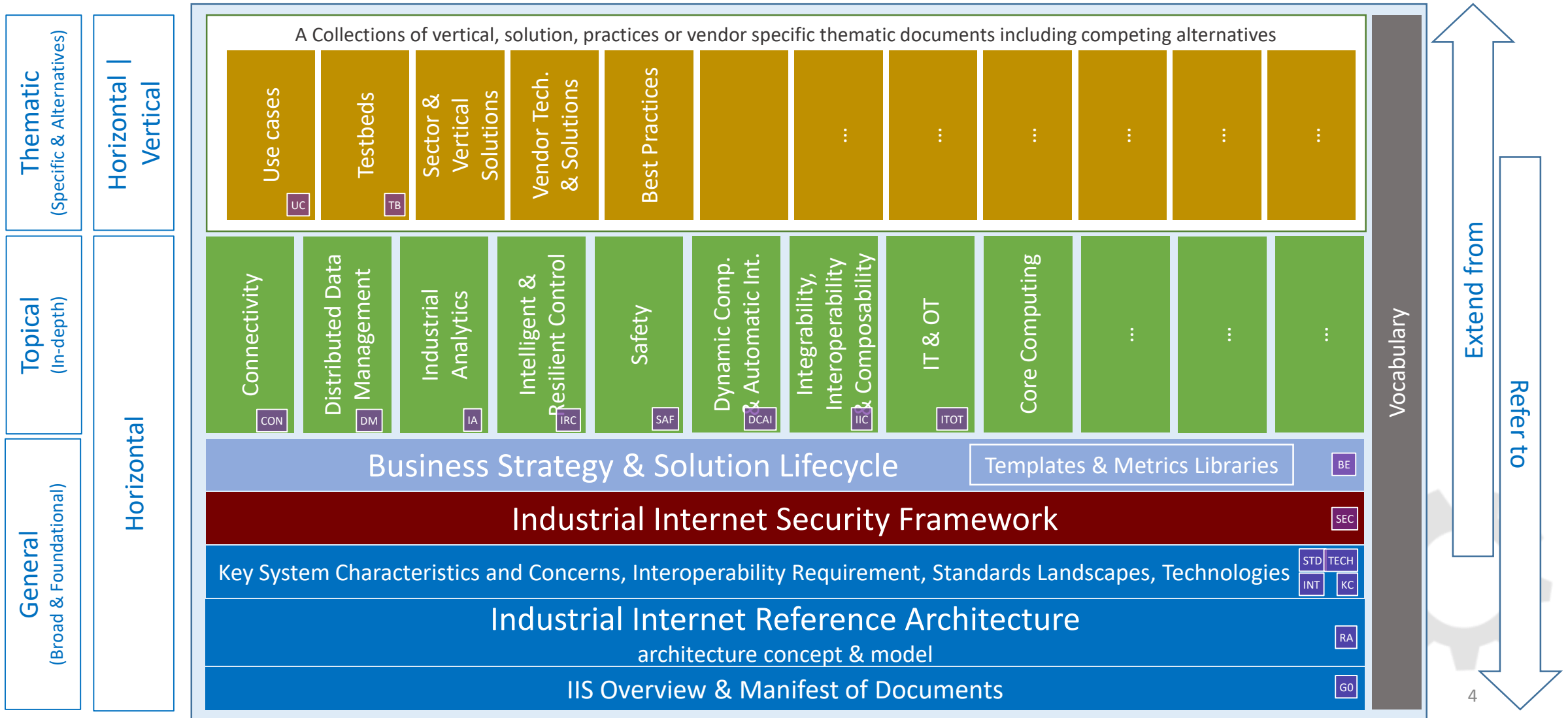
IIC Architecture Task Group Scope

- 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

Thematic (Specific & Alternatives)

Horizontal | Vertical

Topical (In-depth)

General (Broad & Foundational)

Horizontal

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

Use cases — UC
Testbeds — TB
Sector & Vertical Solutions
Vendor Tech. & Solutions
Best Practices
… … … … … …

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
… … …

Business Strategy & Solution Lifecycle — BE
Templates & Metrics Libraries

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

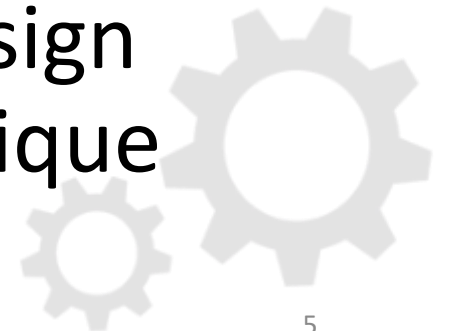Vocabulary

Extend from

Refer to

4

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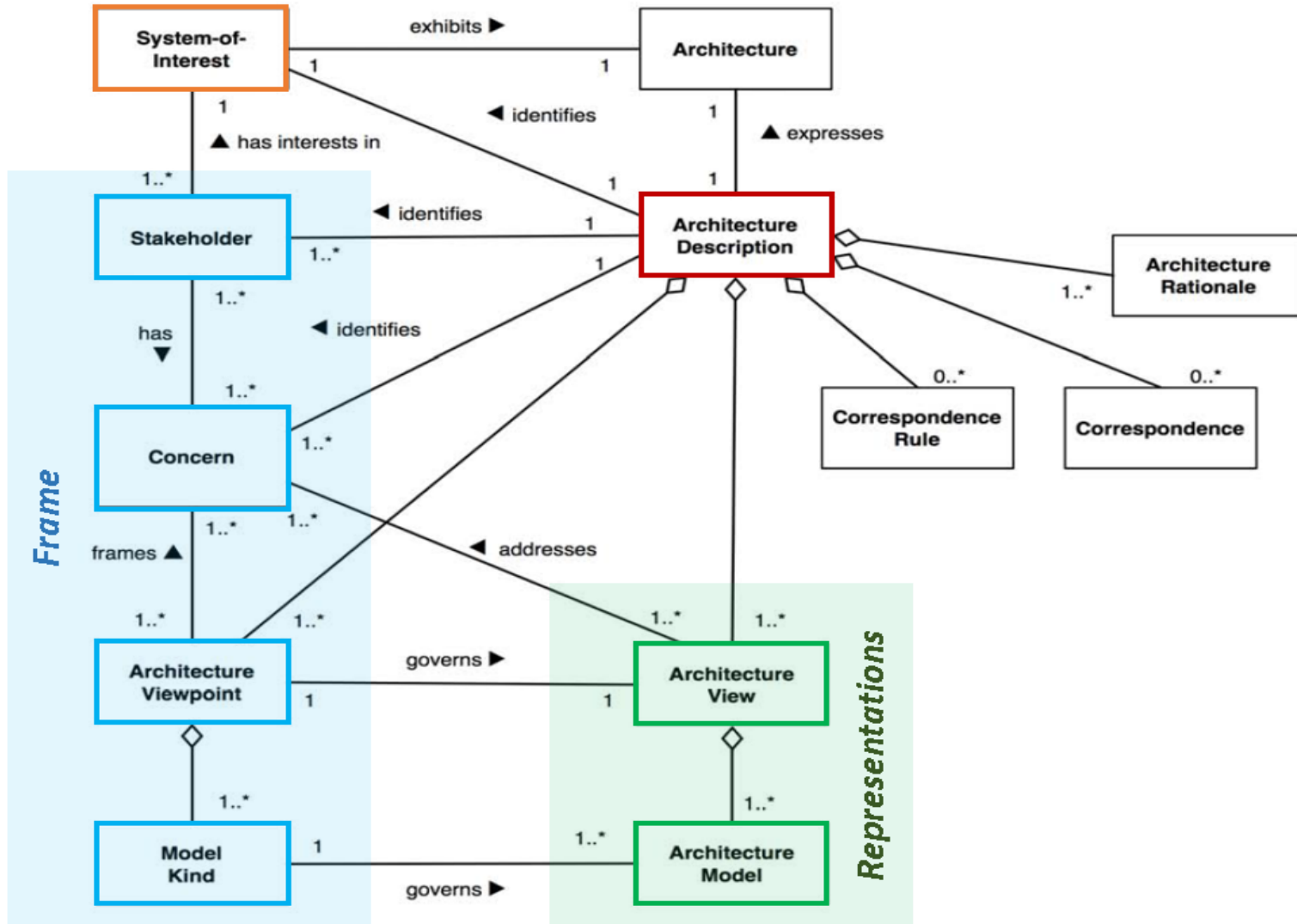
What it is not:

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.

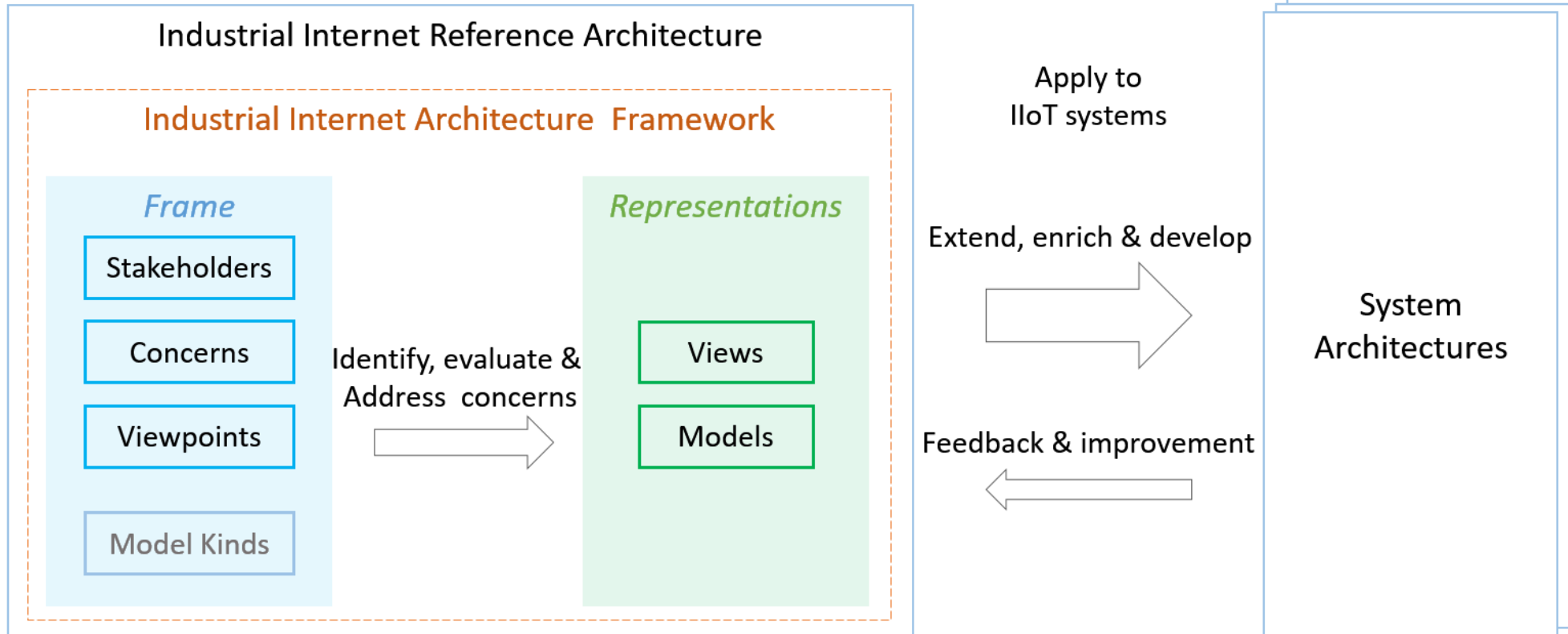# Basis: ISO/IEC/IEEE 42010:2011 – Systems & Software Engineering -- Architecture Description
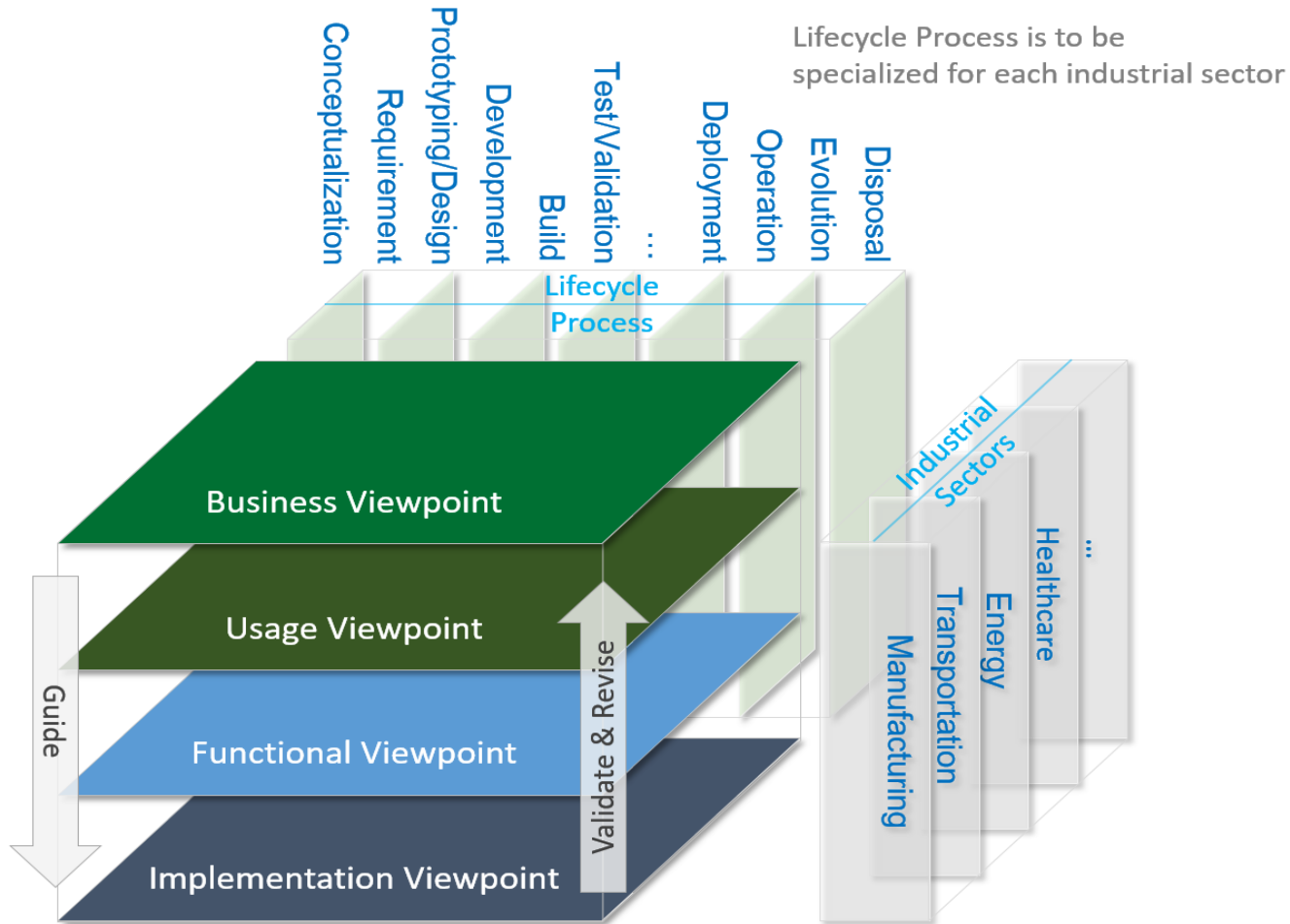

The IIRA leverages ISO 42010

IIRA and IIAF – Design, Build, Deploy & Feedback

The IIC IIoT Architecture Framework

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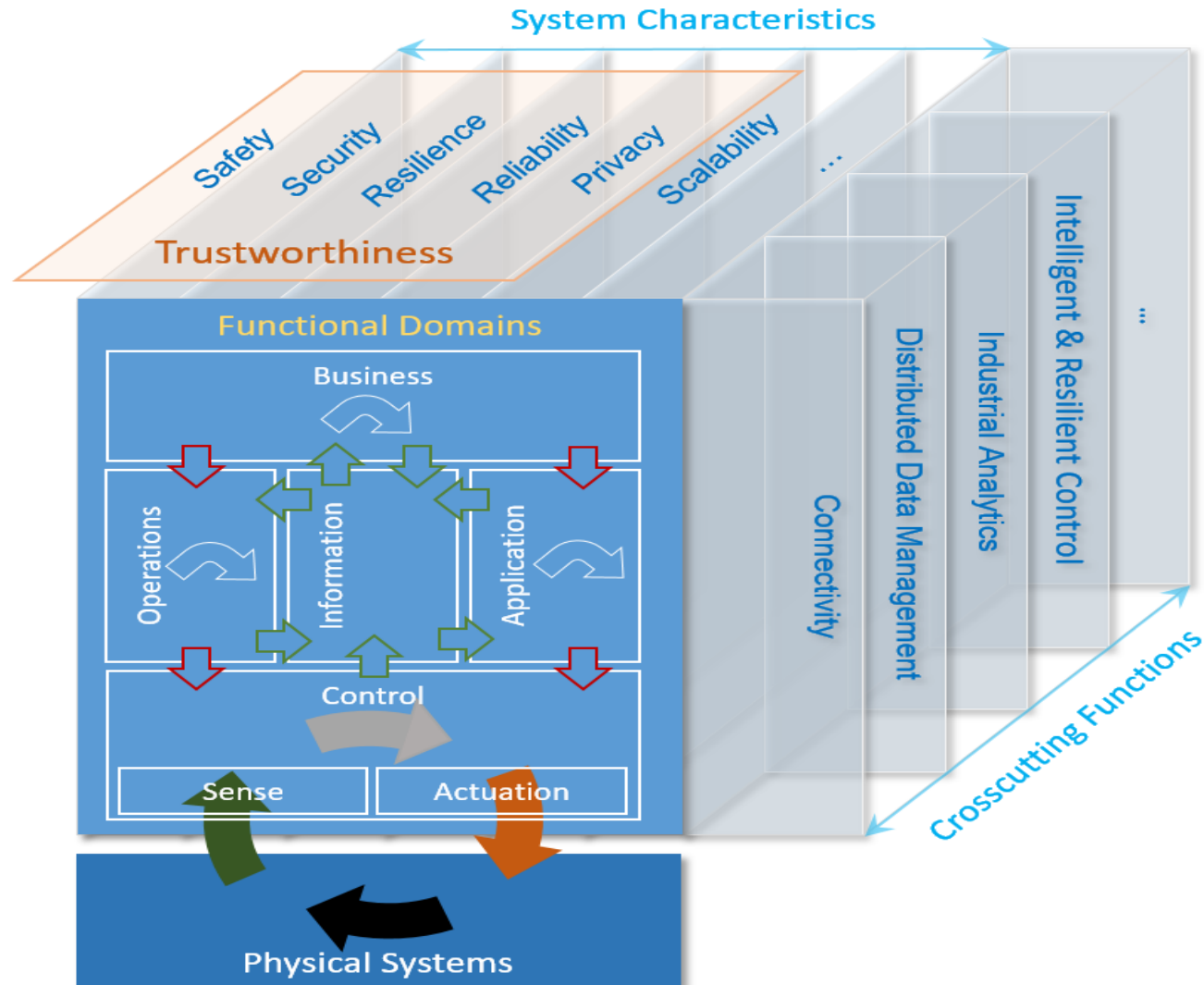- Viewpoints enable view creation regardless of industrial sector
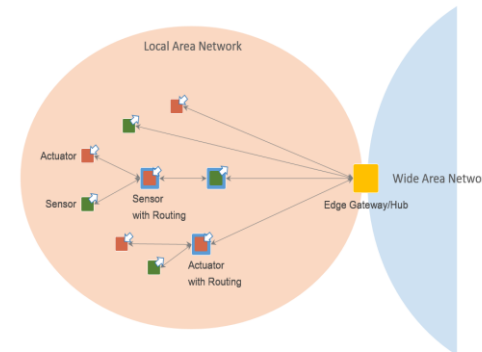
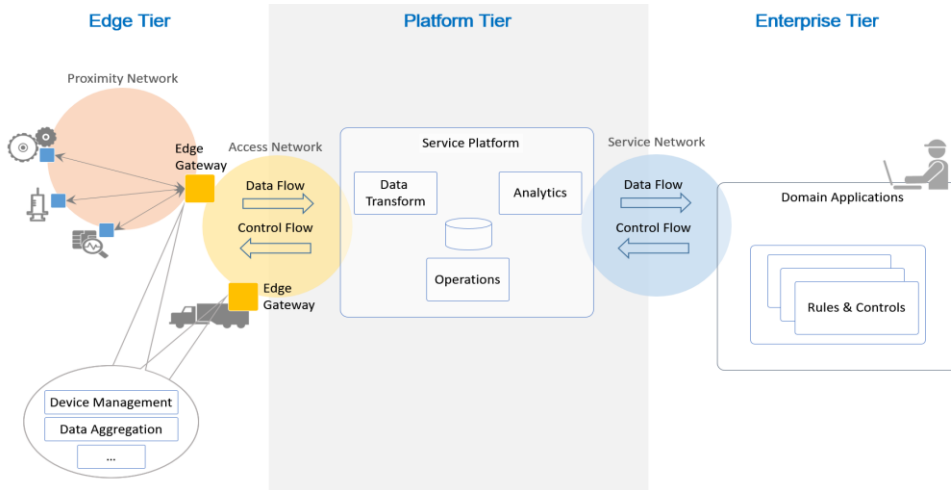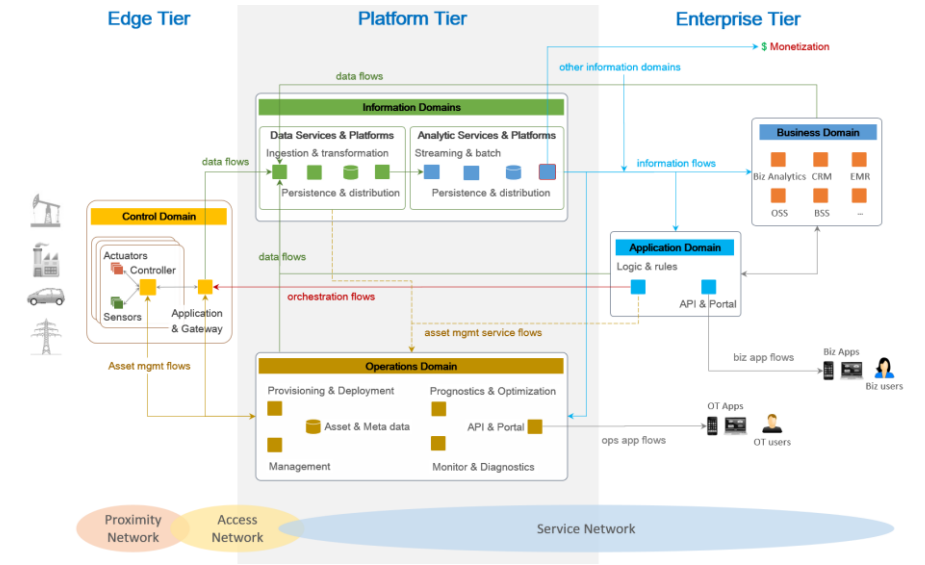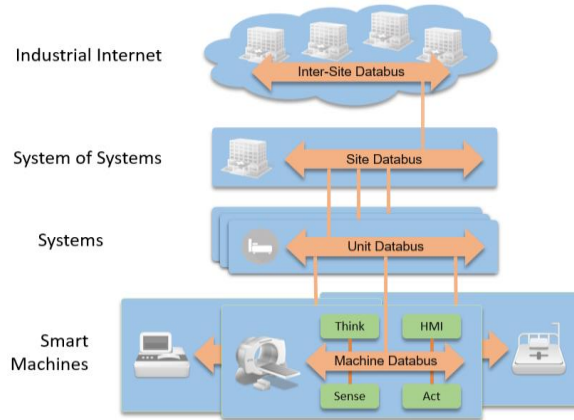# Functional View – Domains and Cross Cutting Functions

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
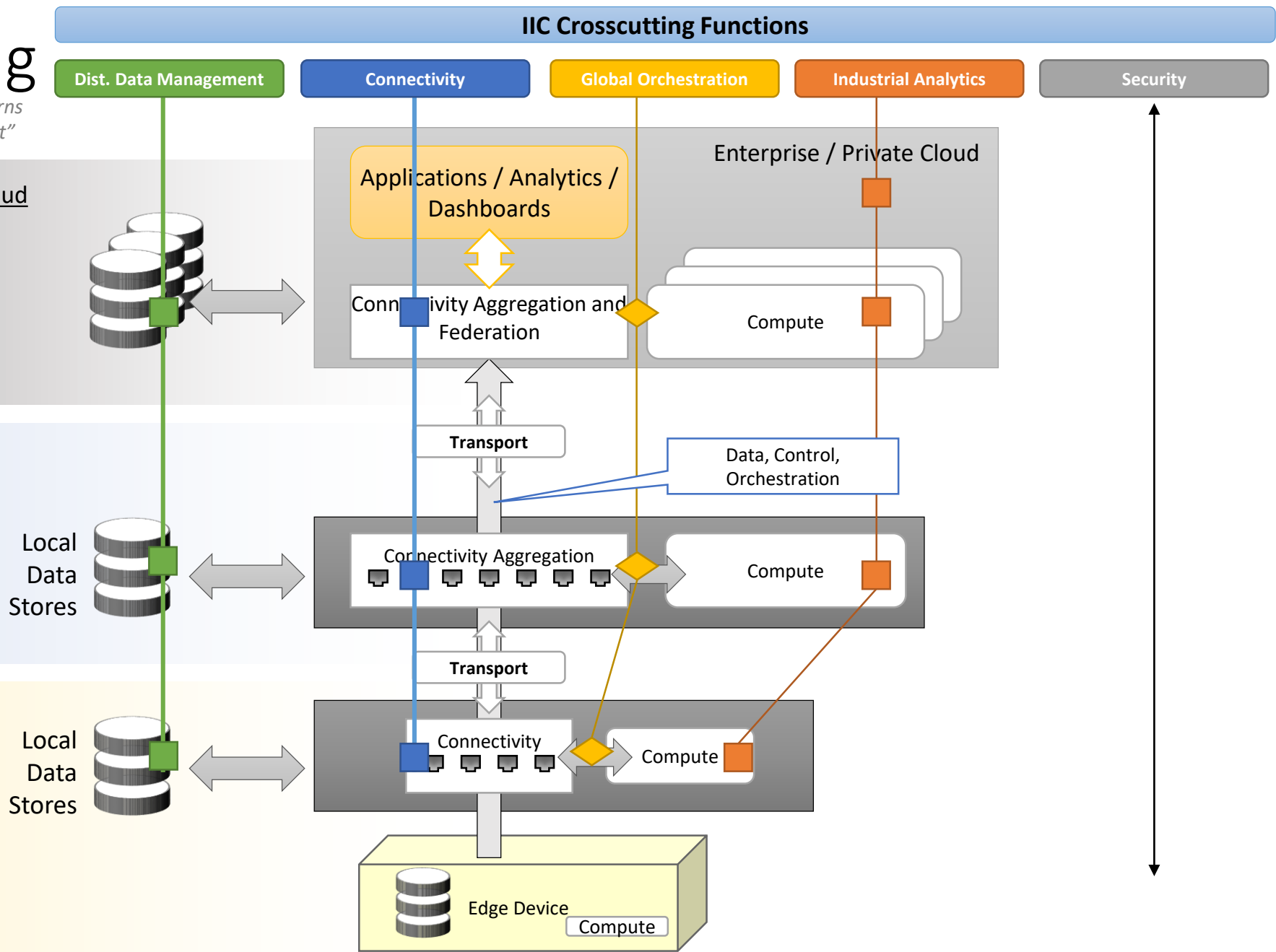
Architecture Patterns

IIC Crosscutting

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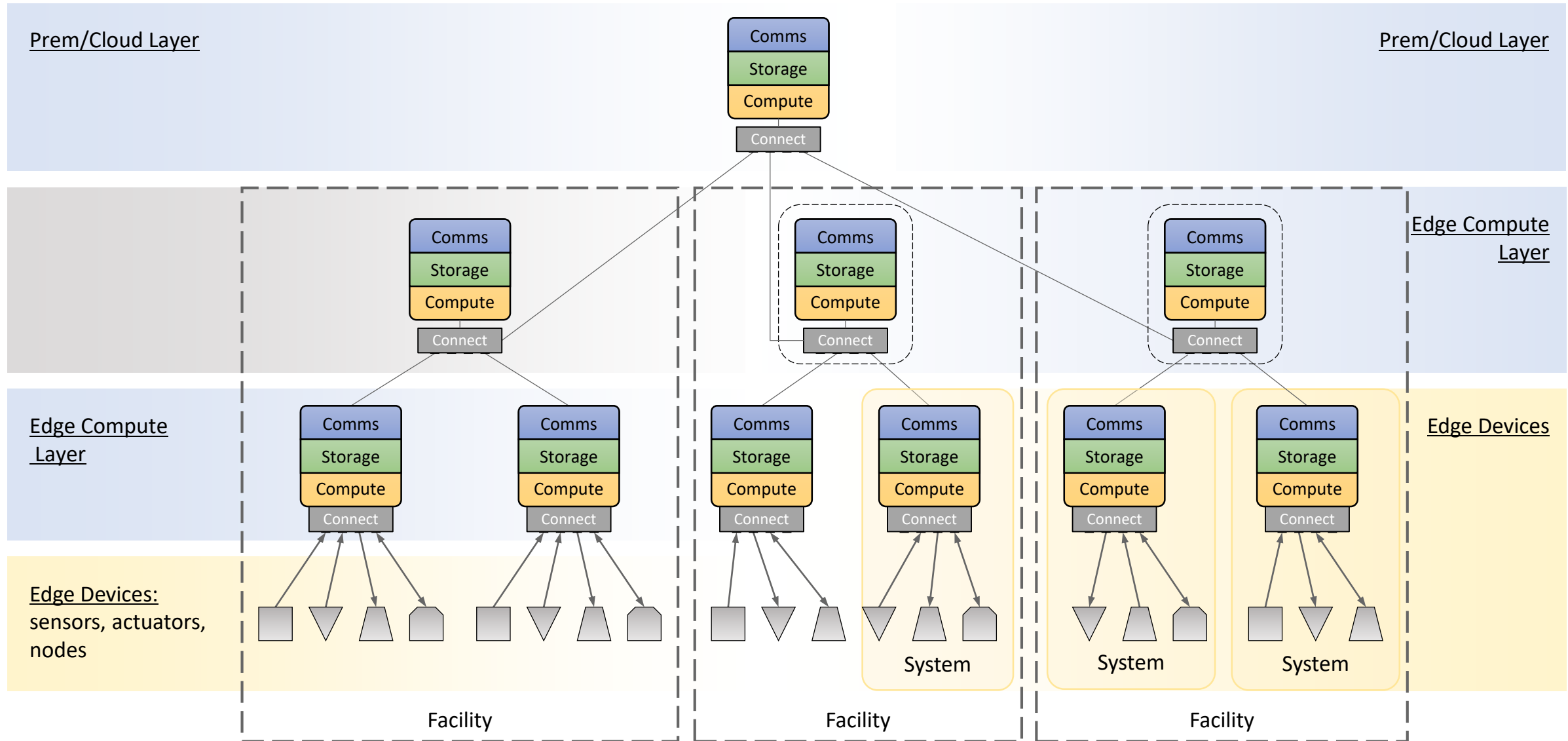

IIC Crosscutting Functions

Dist. Data Management | Connectivity | Global Orchestration | Industrial Analytics | Security

Enterprise / Private Cloud / Public Cloud

Applications / Analytics / Dashboards

Enterprise / Private Cloud

Connectivity Aggregation and Federation

Compute

Industrial Zone / Platform Tier
Manufacturing / IT / Enterprise Data Center

Local Data Stores

Transport

Connectivity Aggregation

Data, Control, Orchestration

Compute

Plant Level / OT / Cell Area Zone/Edge Tier

Local Data Stores

Transport

Connectivity

Compute

Edge Device

Compute

Edge/Edge Computing Definition Diagram

Thanks

Mark Crawford

Standards Strategist, SAP

Mark.Crawford@sap.com

Shi-Wan Lin

Thingswise

shiwanlin@thingswise.com