

# WHAT IS “INTEROPERABILITY”?

1. **Ingestion Interoperability:** Connect Data Sources to Data Stores
  - Normalize data using common semantics upon data ingestion.
2. **Transfer Interoperability:** Connect Multiple Stacks
  - Exchange data between vertical silos.
3. **Mesh Interoperability:** Connect Devices and Services
  - Communication and control among distributed devices and services
4. **Application Interoperability:** Deploy Code across a Distributed System
  - Manage applications running in portable and secure contexts.

# INTEROPERABILITY TYPE VS. TECHNICAL REQUIREMENTS:

Priority	Requirement Type		Interaction Abstraction	Data Interpretation	Discovery Mechanism	Application Environment
1	Ingestion		Description	Data Model		
2	Transfer		Description	Data Model		
3	Mesh		Description	Data Model	Introduction, Directory	
4	Application		APIs and/or Description	Data Model	Introduction, Directory	Management, APIs, Runtime

# IOT DATA AND METADATA STANDARDS MAP: START STATE

Discovery	Ingestion	Exchange	Modeling	Consumption
Descriptions	Encoding	Protocols	Semantics	Query
W3C: RDF Schema/SHACL			W3C: RDF/JSON-LD	W3C: SPARQL
W3C: WoT Thing Descriptions			OGS: O&M	W3C: OWL
LF: Swagger/OpenAPI			iot.schema.org	
RAML			Haystack	
JSON Schema			W3C: SSN	
Microsoft: DTDL/DCL			ETSI: NGSI-LD	
OPC-UA: XML Schema				
W3C: HTML		IETF: HTTP	OCF: oneiota	
Oasis: TOSCA/UDDI		IETF: CoAP	Zigbee	SQL
Oasis: SAML		OMG: DDS	ZWave	
OneDM: SDL	IETF: CBOR	Oasis: MQTT	LwM2M/IPSO	
	IETF: JSON	Oasis: AMQP	OneM2M	
	W3C: XML	IETF: ICN	OneDM	IETF: COIN
	YAML	IETF: IP/TCP/UDP	IETF: YANG	

CRUD(N)

Pub/Sub

RDF

Relational

Structured

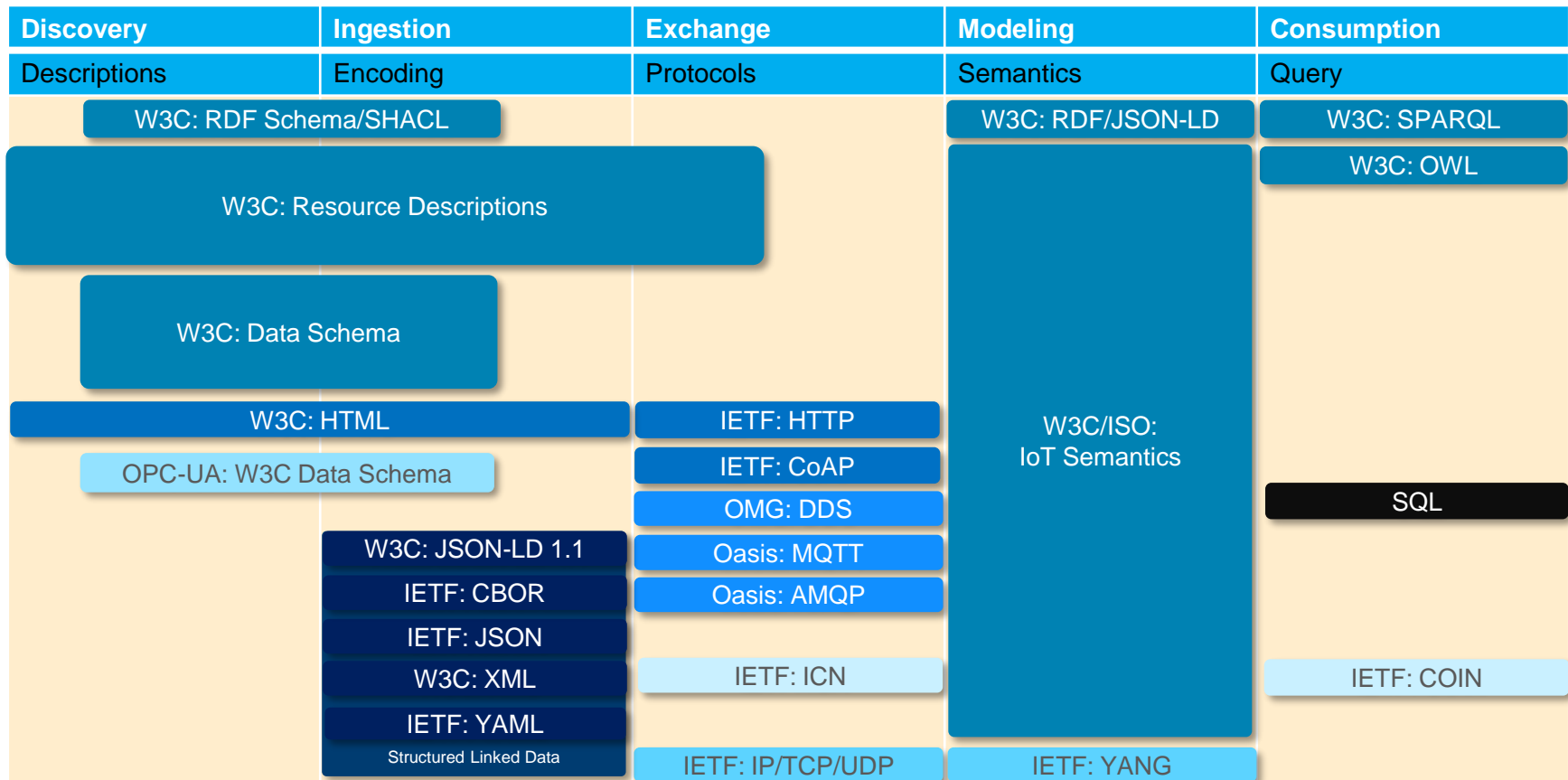
OCF

Other

Emerging



# IOT DATA AND METADATA STANDARDS MAP: TARGET STATE



CRUD(N)

Pub/Sub

RDF

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Structured

OCF

Other

# DATA STANDARDS CONVERGENCE TIMELINE

