

ONAP Integration Through Information and Data Modeling

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ONAP Information Integration GOAL

- We need a cohesive way to have a shared view of information across ONAP (and on ONAP External APIs, e.g., BSS/OSS, Partner Providers, Multi-VIM, third party clouds, etc.) that can be used for or be input into a model driven process whereby the cost of delivering platform functionality is drastically reduced and the time to delivery is dramatically decreased.



ONAP Information Integration Challenges

- Currently there are a number of information and data modeling efforts of varying similarity covering overlapping problem spaces
- These models often apply different models for the same concept or the same class name for different concepts
- The modeling patterns differ. E.g., some are inheritance based, others are composition based, etc.

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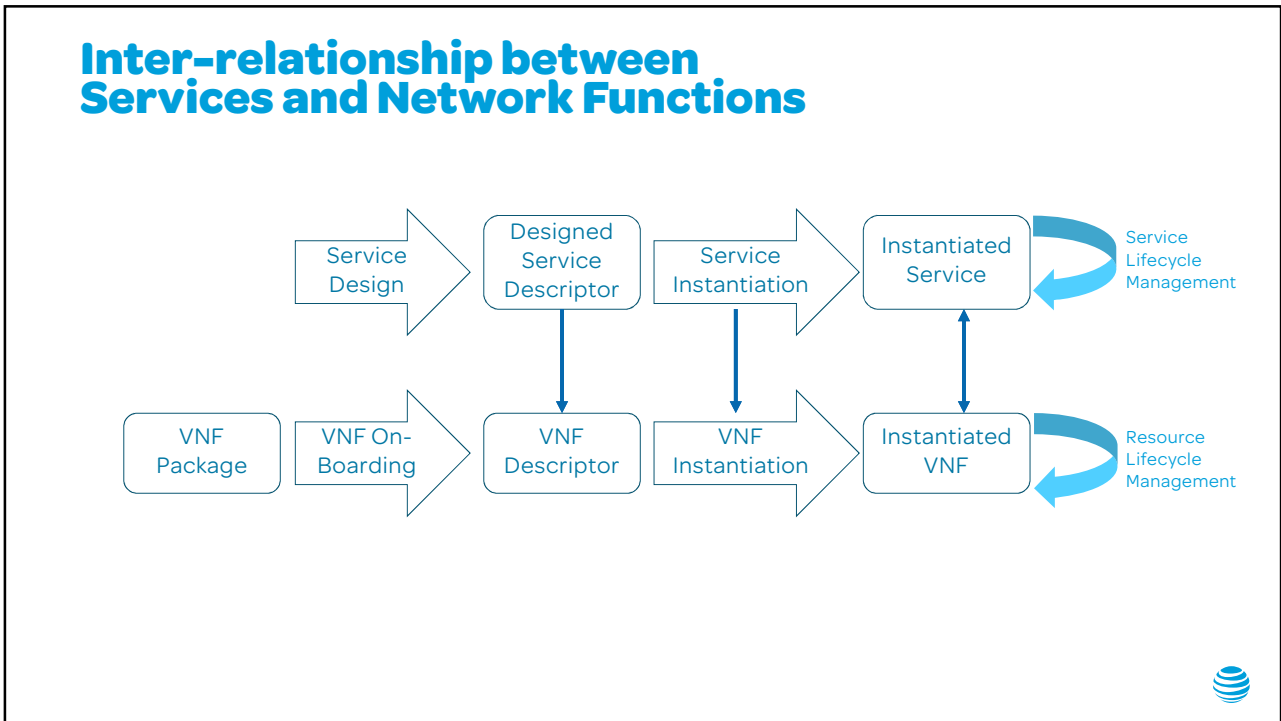
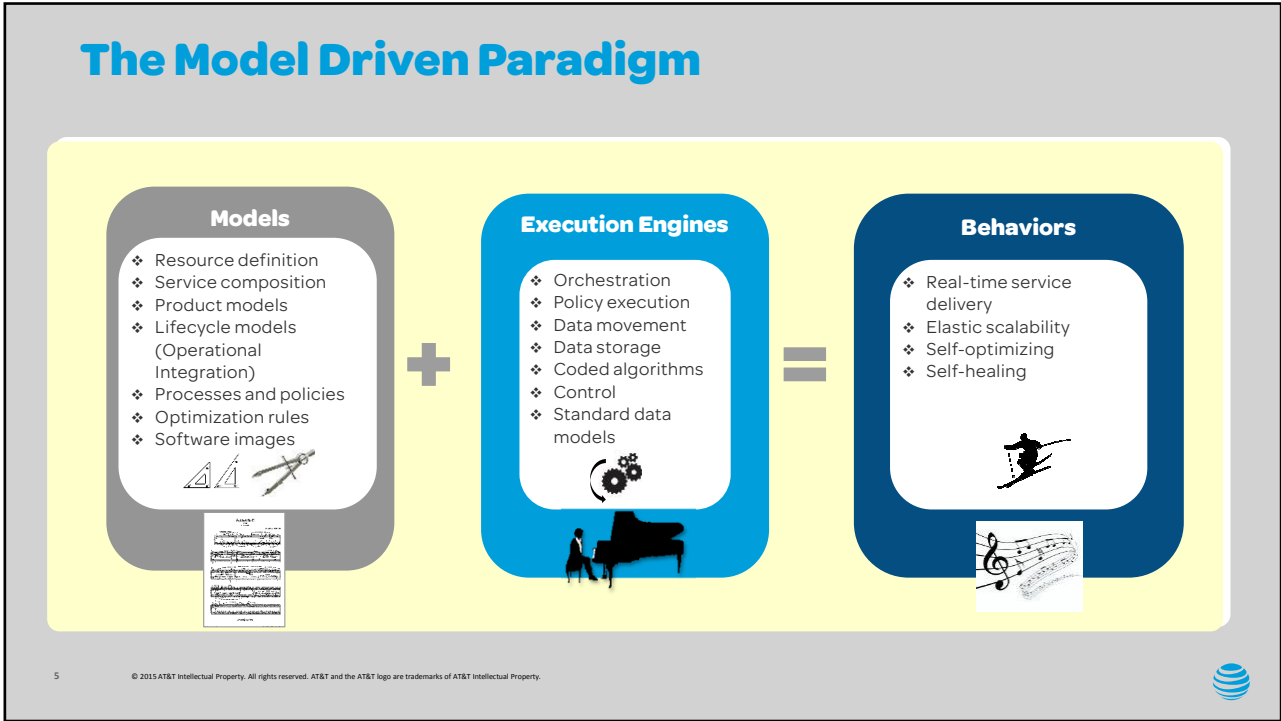
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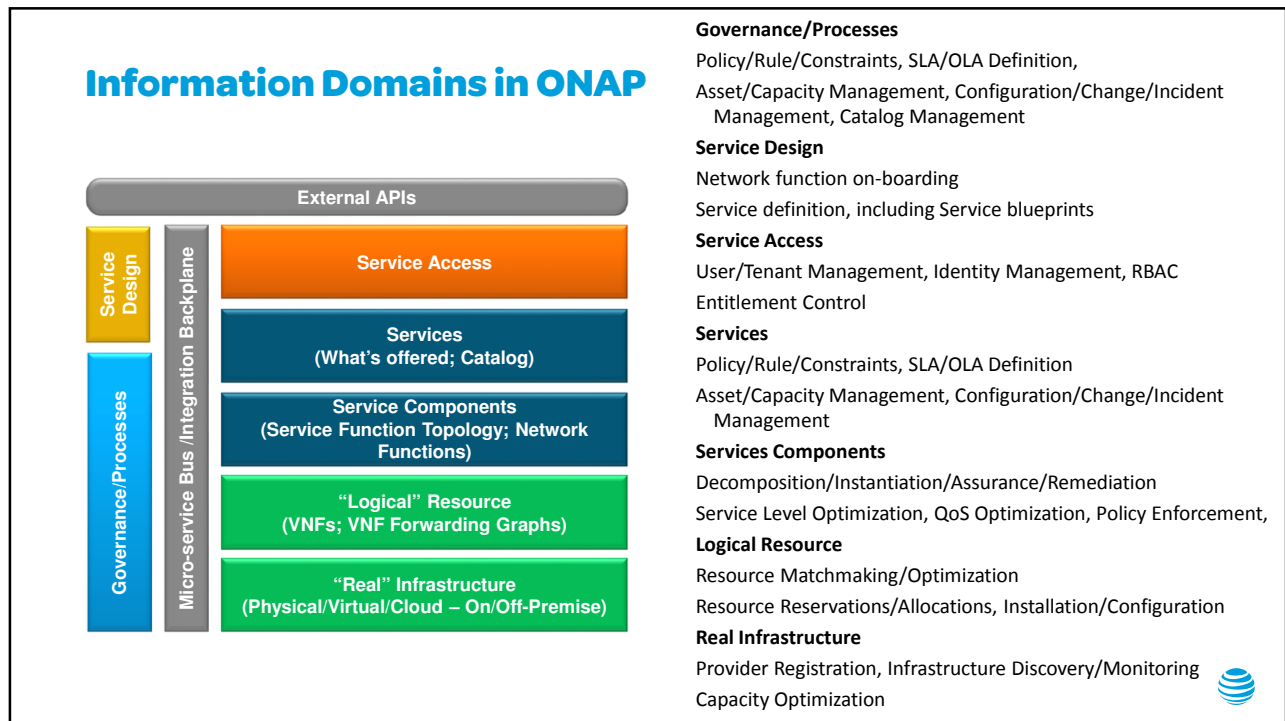
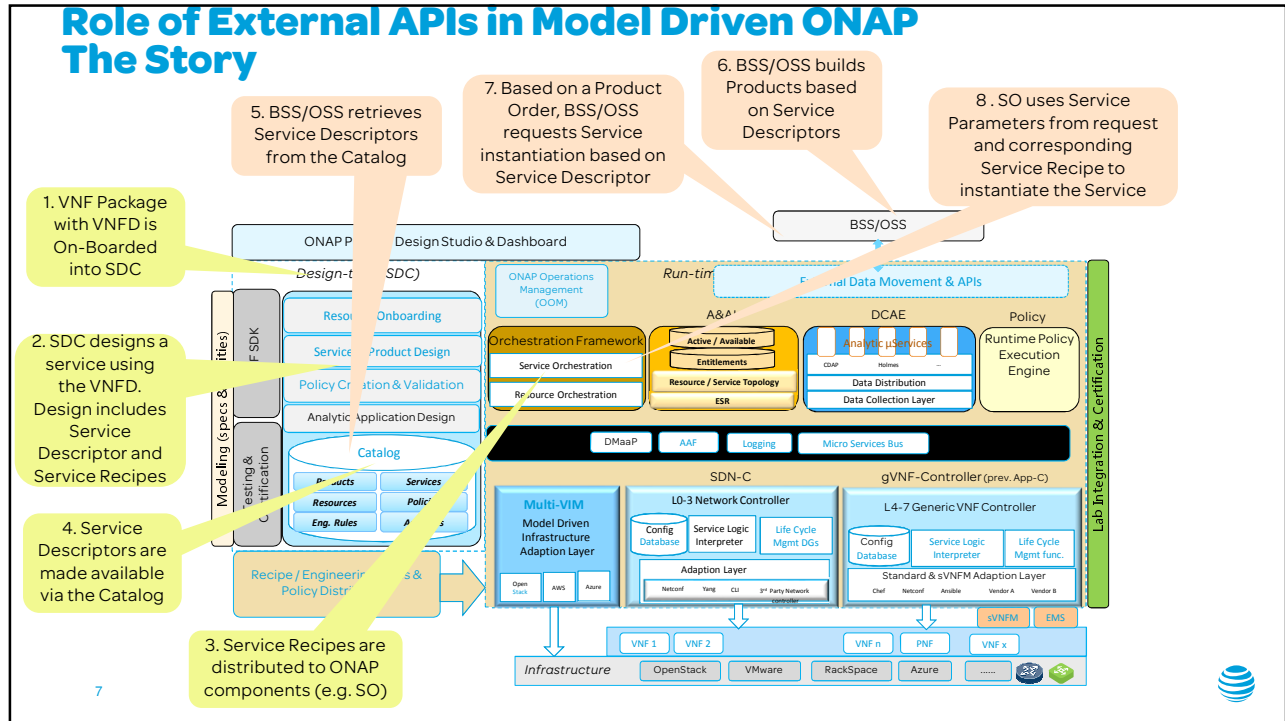


Model Driven ONAP

- Traditionally, introducing new elements, new products, and new services require long software development cycles
- A key objective is to eliminate these long cycles by:
 - Standards to establish common ways provide lifecycle management of VFs in support of operational integration
 - Abstractions to support new types of Services and VFs with minimal changes
 - Generic ways to monitor the infrastructure
 - Standard functions with fixed inputs and outputs that are tunable via metadata
 - Models and processes that are designed, distributed, and interpreted by the execution environment







So... What's an Information Model?

- Information Models define managed objects at a conceptual level, independent of any specific implementations or protocols used to transport the data
- A semantically meaningful representation of **concepts** (classes of entities)
- Described in an **implementation independent** manner
- **Class characteristics** (attributes)
- **Relationships** among classes
- **Operations** (actions) performed on classes by **actors**
- Useful to describe the managed environment, and as a guide to the information and behavior that will be described and coded in the Data Models.
- May be represented in Unified Modeling Language (UML)

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Benefits of Information Modeling

- Common Terminology and Definitions: The Information Model captures common terms, semantics, and definitions for shared information.
- Stewardship of Information: Identifies the domain of information to be managed and controlled by a stewarding system and the contexts associated with each;
- Management of Information Integrity and Redundancy: Identify where information is produced and made available. An Integrated Information Strategy should identify the processes for maintaining the integrity of Information;
- Interface / Microservice Characterization: Integrated Information Model will be used to describe and characterize interfaces / microservices and separations of concern;
- Consistent Methodology, Tools, and Processes: Define and establish the methodology, processes, and supporting tools;

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Information Model Guiding Principles

Abstractions and Constructs: described in terms of information categories and high level information classes including properties (e.g., attributes, states, associations, etc.)

Focus on Shared Information that is exchanged among the interoperable components within ONAP and with external actors.

Document properties behavior and semantics in Integrated Information Model

Define a common platform independent representation of shared information, while providing the means to extend the model in a semantically rich fashion

Ensure that ONAP functionality and information is developed in a logically consistent fashion, allowing rapid integration

Enablement of Model Driven Architecture and Design

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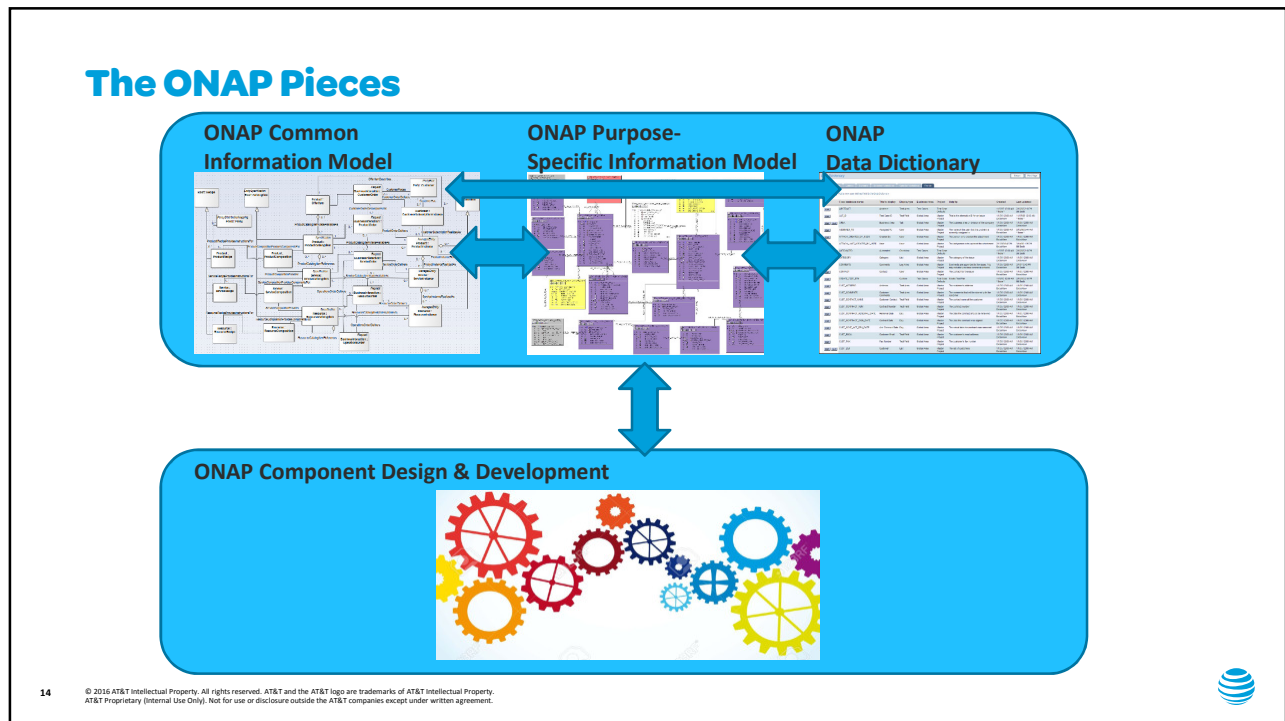
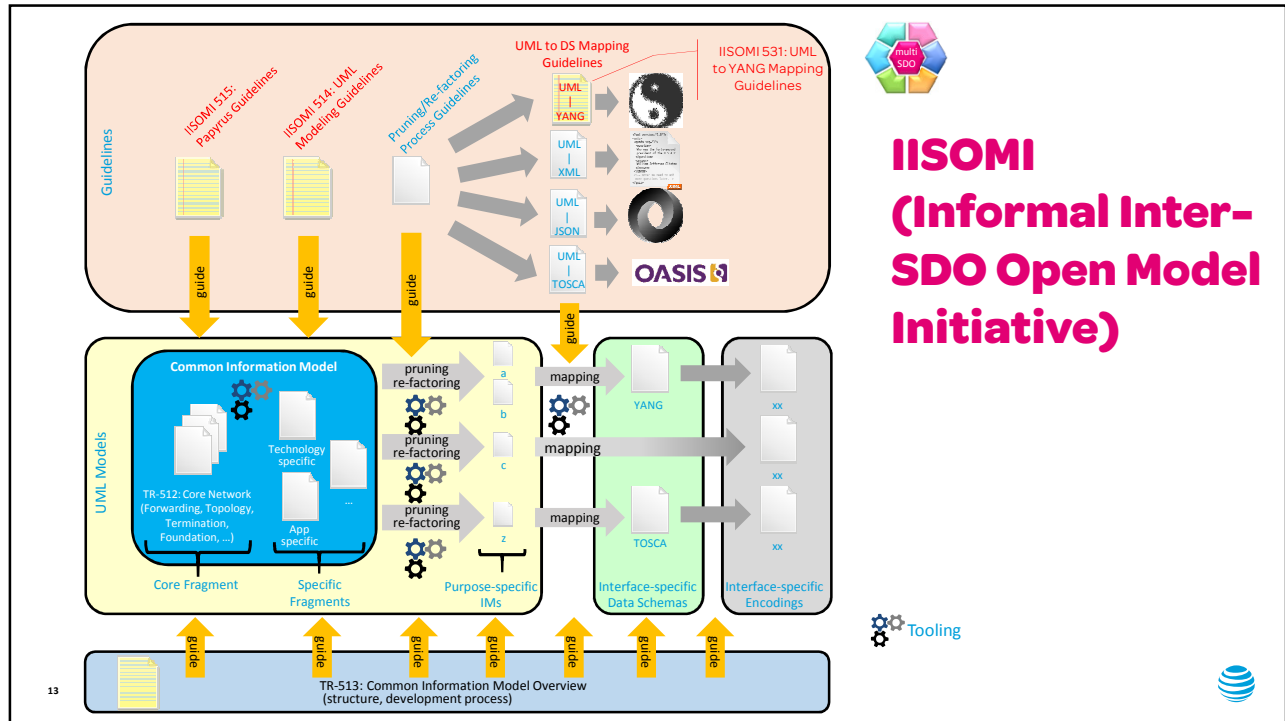
What about Data Models?

- Data Models define managed objects at a lower level of abstraction than Information Models. Data Models include implementation and may include protocol specific details.
- A Data Model formally describes the **structure** and the **semantics** of all the data that are (a) stored in data management systems, and/or (b) accessed and manipulated by data-centric applications across APIs.
- The information exchanged across an API is described within a data model that is specified in a **data modeling language**, for example YANG or YAML
- An API also defines the **encoding format** that is used to encode data into a representation and format that can be exchanged across the interface according to the structure described by the data model, and the protocol that is used to carry the encoded interface data (e.g. NETCONF, RESTCONF or REST/HTTP).

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Data Dictionary

- A comprehensive list of the possible types of attributes, since attribute types are the core re-usable components of a data model;
- The list of individual attributes and their types in the data model, since attributes can be reused in different entities or relationships;
- The naming convention used for types, attributes, entities and relationships, to ensure a common language and help avoid ambiguity; and
- Examples of usage of types (in entities or relationships, even though entities and relationships are not part of the data dictionary itself), naming conventions, etc.

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General Integration Methodology



- Identify common Information Constructs from an ONAP wide perspective using Use Case interactions, microservice & interface definitions as input.

- Continuous Integration with appropriate standards and relevant ONAP efforts related to architecture, information modeling, and microservice & interfaces



- Use UML tools (e.g., Eclipse Papyrus) to capture living ONAP Integrated Information Model and Use Cases

- Revise descriptions by adding additional details as they are discovered



- Identify main consumers and producers / stewards of the Shared Information from a functional standpoint



- Share and gather feedback of model content with key stakeholder project

- Apply and Map model when designing and developing data models for APIs and microservices

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ONAP Information Modeling Role

Guide the development ONAP Abstractions and Constructs, and form an Integrated Information Strategy and Common Model:

- Provide a coherent view of shared information
- Identify common abstractions and constructs across ONAP
- Capture common terms and definitions with respect to shared information
- Help identify unplanned redundancy
- Facilitate interactions for common interfaces (and microservices)
- Identify the primary authority (or Steward) for each piece of shared information from a functional perspective
- Form a common Integrated ONAP Information Model to be used as an integration resource (Federated approach)

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ONAP Information Model Topics Timeline

Draft Release, October 31, 2017:

- Network Updates: Connection Points; Virtual Link Descriptors; VNF Forwarding Graph Descriptor
- VNF Descriptor Model (w/ initial Deployment Flavors)
- Initial Service Descriptor / Service Component

Draft Release, Mid-December, 2017:

- Multi-VIM Concepts
- Element Groups
- Refinement of Deployment Flavors
- Service Descriptor Refinement
- VNF Descriptor Refinement (e.g., Extensions, Event Descriptors, Healthcheck, etc.)
- Virtual Resource Elements
- Service and Resource Lifecycle Management Concepts

2018 Backlog:

- License Descriptor and Usage
- Service and Resource State (initial)
- Service Path as a Service
- Policy Model
- Assurance (including control loop management)
- Address Space Management

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