OSLCFest 2021
Navigating Versions in Configuration Management

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What we value in our products

• **Engineers working where they are productive**
  o Using tools of choice
  o Working simply and effectively

• **Tools that are flexible to the engineering needs**
  o Supporting Standards
  o Configurable to your workflow

• **Tools that work in the enterprise**
  o Secure systems of record (with no copies)
  o User authenticated access to data
  o Server-side integration to support deployment, support, availability
(Enterprise) Configurations
Domain configurations are logical. Streams branches of versioned artifacts centered around a project.

Most tools natively have this support.

And those that don’t we usually leverage a version control system to version the files.
Challenges arise not as much on a single domain, but rather the combination of multiple domains.

Which version relates?
When do I update?
How do I link resources?
How do I understand change has occurred?
What is an Enterprise Configuration?

- It is a temporal context
- It is a purpose
- It is a scope
- It is a collection of artifacts
- It is a singular in versions of any particular artifact
- It spans repositories
Things that demand an Enterprise Configuration

- A product release
  - HW Revisions
  - SW Revisions
  - Approvals
  - Tooling
  - …

- A gate review
  - Documents
  - Test Results
  - Risk Records
  - …
Implementing Enterprise Configurations in Tools

• We want configurations to be natural parts of our tools
  o They need to focus on the natural language of the current tool
    • But provide a context of how they operate in the enterprise
  o They must be intuitive to how teams use tools

• Simple Examples navigating the Change – Requirements Boundary
  o Moving a Story to a new Release should use the requirement versions for the release
  o Temporal nature of Defects.
    • “Found in” describes a past version of where an issue was detected.
    • “Fixed in” describes a future version where it is fixed
Example of Configurations in the Enterprise (Jira and DNG)
Enterprise Artifacts
The Workflow Artifacts in the Digital Thread

• Workflow Artifacts
  o States and Sequences
    • They have an outcome
  o Examples
    • Change Request
    • Reviews
    • Tasks
  o History (but no Versions)
    • Time is our index
  o No Branching
    • Hierarchies common
    • Copies/Clones common
  o Owned by Projects (Teams)
The Asset Artifacts in the Digital Thread

- **Asset Artifacts**
  - Entities
  - Examples
    - Requirements
    - Test Cases
    - Model Elements
    - Code
  - Versions
    - Each version can be used in multiple contexts (reused)
    - Relate in branch and merges
  - Owned by Collections
    - Instances in Streams and Baselines
The Configuration in the Digital Thread

• Asset Configurations
  o Instances of a Collection/Container
  o Examples
    • Git Branch
    • Released Requirements Document
    • Bill of Materials with Effectivity
  o Asset State
    • Baseline (static) or Stream (dynamic)
  o Scoped
    • Local -> Single Repository
    • Enterprise/Global -> Cross Repository
      Composite of Local Configurations
Digital Twin from Web to Thread to Process

- Your digital assets are a web of relationships and versions
- An instance (configuration of artifacts) is a Digital Thread
- Creation of the thread is the application of your process with workflows
  - Creating artifacts
  - Assembling artifacts
  - Configuring artifacts
OSLC and Configurations
OSLC and Configurations

• OSLC Provides a Foundation for Enterprise Configuration Management

• Uniquely Identifiable OSLC Elements
  o Component – Unit of Configuration
  o Concept Resource – Unique Resource Independent of Version
  o Configuration – Set of versioned concept resources containing only one version of a resource
    • Baseline – Static
    • Stream – Modifiable
  o Local Configuration – Single Component
  o Global Configuration – Aggregate of Local Configurations and Composable Configurations
In Common Tools

• Similar Concepts Exist in Most Repositories
  o Baselines
  o Change Sets
  o Branches
  o Bills of Materials
  o Document Bundles

• OSLC Focuses on the essential elements
  o Separation of a Resource from it’s Version
  o Composability for Reuse
  o Demands for stable & unique identifiers

• OSLC Becomes an Overlay to Address the uniformity of the Enterprise
Links and Configurations
The Linking in the Digital Thread

- **Links**
  - Have a role (relationship)
  - Are an attribute (written & deleted)
  - Are owned by an endpoint (artifact)
    - Ownership is by the elaborating or referencing artifact
  - Point to the basic artifact (unversioned)
    - Version is resolved by a configuration (context)
Links in a Configuration Managed World

• Basics from the Standard
  • Links are owned (stored on a single artifact)
  • Links have a role (association type)
  • Links have a directionality (point to an artifact (source to target))
  • Links are contextualized to version with configuration information (Target GC)

• What is stored in a link
  • An association type (Implements Requirement)
  • An identifier/short title (519)
  • A title (My favorite requirement)
  • A resource URL (https://elm/rm/resources/Bl_BkaxJtwEeqNGNQYj3xGng)

• What is unique
  • No copies of content
  • No storage of the backlink
  • Ownership is based on type, not the location of creation
Ownership of links

- Ownership is based on the link type and the artifact types
- This is driven by the standard itself, and reflected in tools supporting ConfigManagement
- Workflow objects always store the link
- Versioned artifacts store by rule through the Software/Systems Lifecycle
- The links don’t store the version
  - The version of the artifact and the link target is driven by your current context

https://jazz.net/litmus/view/Deployment/IntegratingWithConfigurationManagementEnabledCLMApplications/
Resolution of Backlinks on a Target

1: Are there any artifacts linking to me in Configuration X?

2: Here are the artifacts that are linking to you in this GC and their roles. (uri references)

3: Please provide me some details about yourself

4: Compact & Rich Preview

On change, update listeners

Get artifact details

List of changed artifacts (with uris)

Are there changes? (polling)

Target Artifact → Indexing Services

Source Item → TRS Service
Example of Configurations in the Enterprise

(Link Discovery)
Managing (Enterprise) Configurations
Enterprise Configurations

• Enterprise Configurations
  o Are cross repository
  o Are hierarchical
  o Are deterministic
  o Are composable
  o Do have a purpose
  o Require tooling

• Enterprise Configurations
  o Enable unifying silos
  o Eliminate conflict & copies
  o Preserve consistent work
  o Enable reuse

Other repositories need to contribute to the Enterprise Configuration Manager
Enterprise Configurations Are the Future of the Digital Thread

• In The Large
  o Product Releases
  o Production Gate Reviews
  o Safety Cases
  o PLE Practices
  o ALM-PLM Unifications

• In The Small
  o Subsystem Development
  o Gate Reviews
  o Asset Reviews
Process Orchestration in the Enterprise
Thank You

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