OSLCFest 2021
Deploying OSLC in the Enterprise

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Who is SodiusWillert?

SodiusWillert designs and distributes software solutions for Enterprise Interoperability, Data Transformation, and Model-Based Code Generation to improve traceability, exchange, and sharing of engineering data in highly regulated industries.

With offices in France, Germany and the USA, we deploy our solutions worldwide in Aerospace, Automotive, Transportation, Defense and Medical industries.

What we value in our products

- **Engineers working where they are productive**
  - Using tools of choice
  - Working simply and effectively
- **Tools that are flexible to the engineering needs**
  - Supporting Standards
  - Configurable to your workflow
- **Tools that work in the enterprise**
  - Secure systems of record (with no copies)
  - User authenticated access to data
  - Server-side integration to support deployment, support, availability

Interoperability is an Enterprise Standard

Preserve repositories

- Distributed systems of record.
- Unique data models.

Support linking within and cross projects

- Semantics of links & ownership.
- Integration points (pickers & previews).

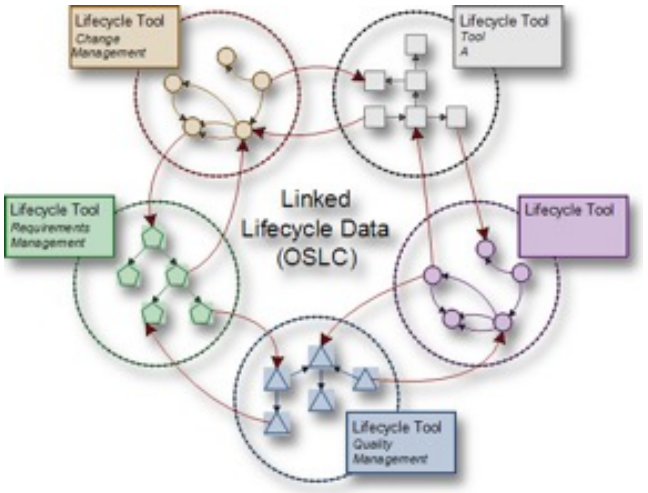
Support for configurations

- Versioning artifacts.
- Selection of the version of artifact target of a link.

Enterprise Approved

- Authentication and Audit Controls.
- Distributed & Connected topologies.

OSLC



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Our Deployment Experience

What have we experienced

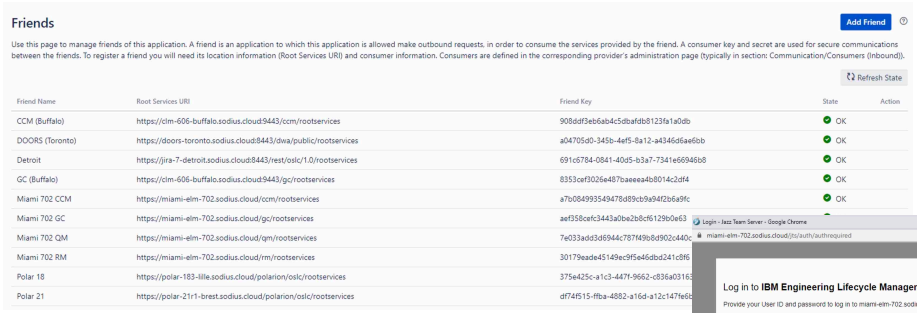
- IBM Jazz Deployments
- Creator of RLIA for Windchill
  - Unique App Server to provide OSLC Services for PLM
- Creator of OSLC Connect for Windchill
  - Integrated Windchill OSLC Services
- Creator of OSLC Connect for Jira
  - Jira OSLC Services for connecting to IBM ELM, DOORS Classic, Siemens Polarion, Windchill …
- Custom OSLC Services
- 100s of deployments of OSLC Tooling

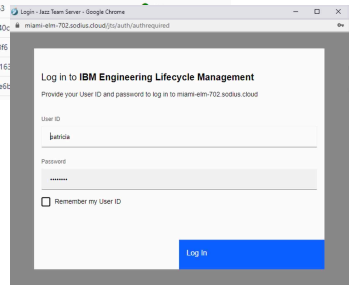
Basics of OSLC

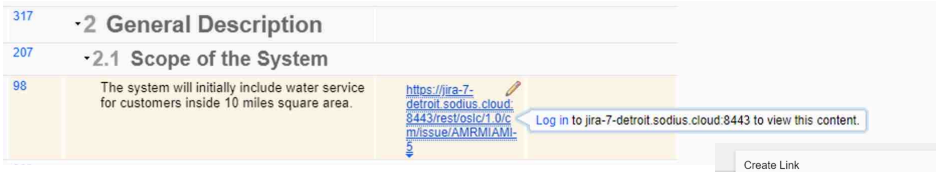
(That affect deployment)

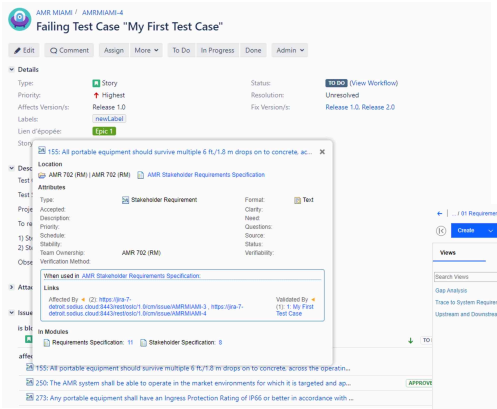
OSLC Interactions (Simplified)

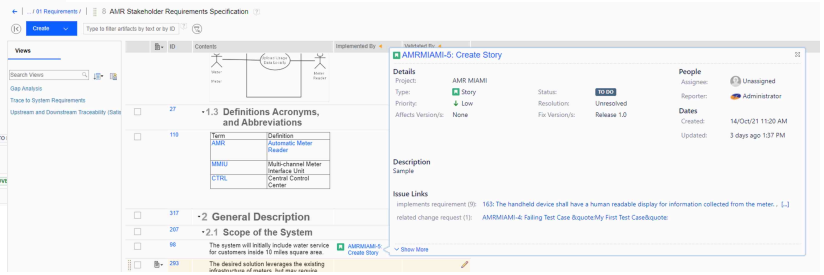
- Connectivity and Discovery
  - Visibility, Network Connectivity
- Authentication and Authorization
  - Authentication Methods
- Embedding and Linking
  - iFrames and Links

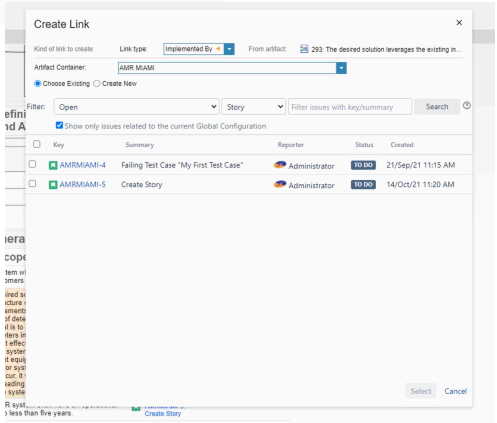










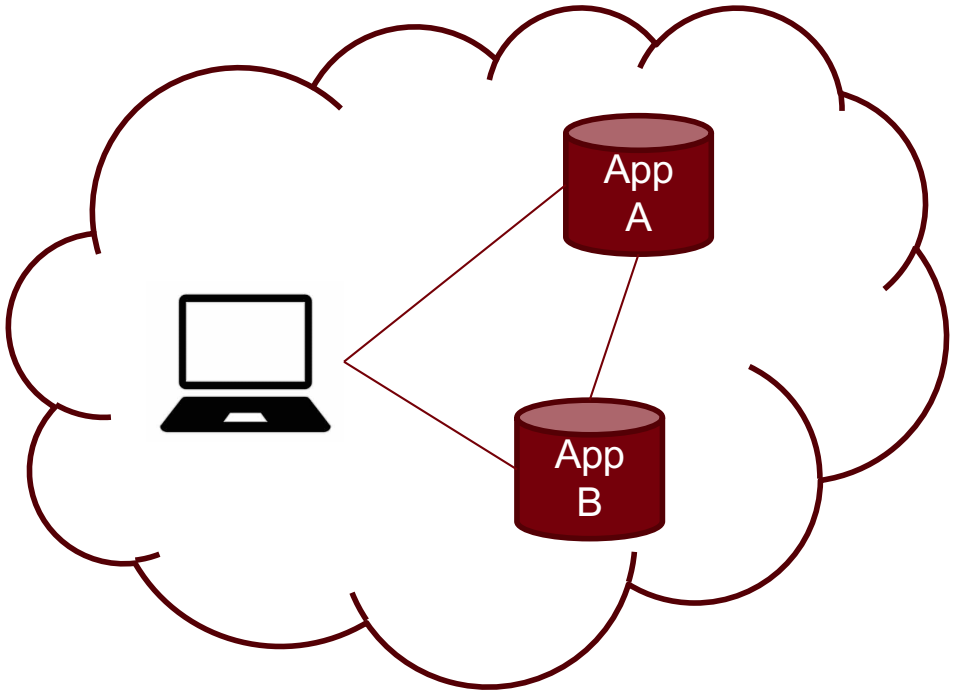


Topology Basics

Most Basics of Topologies

- Single Client
- Single Domain
- Private Network
- Two Applications

- Interactions
  - Friending (key & secret exchange)
  - Authentication
  - Authorization
  - Embedded User Experiences
  - Client-Server, Server-Server Interactions



Interactions are safe, simple, and private

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Enterprise Issues are Simply

- Connectivity
- Security
- (Long-Term) Consistency

Once deployed, OSLC Integrations are extremely stable and robust

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OSLC And Security

Security & OSLC Impacts

- Block Server Interactions
  - Preventing access to a server from unexpected locations
    - *Block access*
    - *Filter (content and speed) access*
    - *Modify access*
- Block Browser Interactions
  - Prevent browsers from
    - *Displaying remote site content*
    - *Allowing display of your content remotely*
    - *Providing auth/session tokens to a remote site*

Goals of our IT Teams can be different than those of our OSLC Repositories

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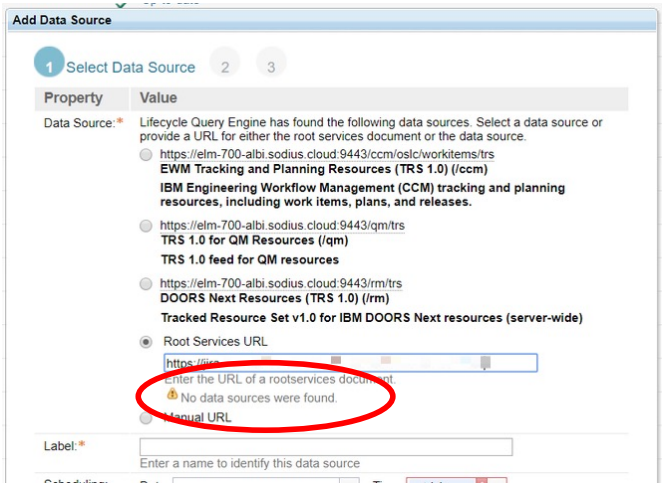
Common Challenges
(& why they are hard to diagnose)

Example 1: TLS 1.2 Error

- Context
  - Connecting to TRS in Jira from IBM ELM
    - *IBM ELM attempting to retrieve Jira rootservices document*
  - Failure shows inability to retrieve document
- IBM and Atlassian can Friend
  - Jira -> IBM
  - IBM -> Jira
- Rootcause
  - IBM LQE HTTP Client configured only to support TLS 1.0/1.1
  - Jira configured to require TLS 1.2 causing security negotiation failure and failure to download



Security configurations can be opaque to the application admins

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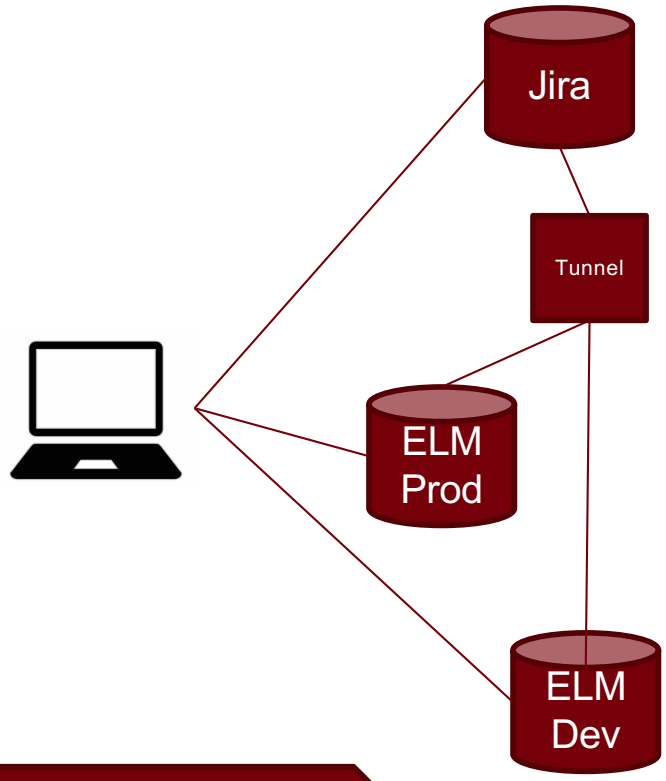
Example 2: Misconnected Tunnel

- Context
  - Connecting Jira to IBM ELM through a private tunnel
  - Failure to Friend between ELM to Jira

- Friending from ELM is successful with Jira
- Friending from Jira to ELM fails with incompatible server
  - Rootservices is downloadable but what is seen by by the Jira Server is different from what you see as a client



When clients and servers take different routes the real view of the situation is difficult to diagnose

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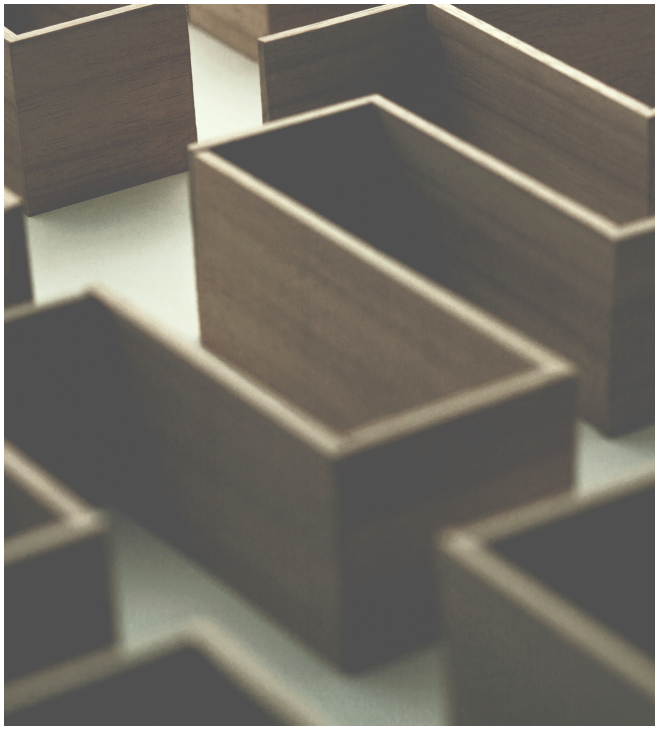
Why are (common) mistakes difficult to diagnose?

- Applications use Standard Web Protocols
  - Example: 401 (Unauthorized) , 500 (internal server error), …
- Users can see symptoms but not causes
  - Blank windows
  - Blocked content
  - 'not found'
- Debug tools are focused on Developers
  - Network traffic
  - Web Headers
- Access to logs can be limited in enterprises
- They serve another (valid) intention
  - Security blocks and filters
- Many individuals involved
  - Application Admins
  - Network Admins
  - Application Users



Common Challenges & Impacts

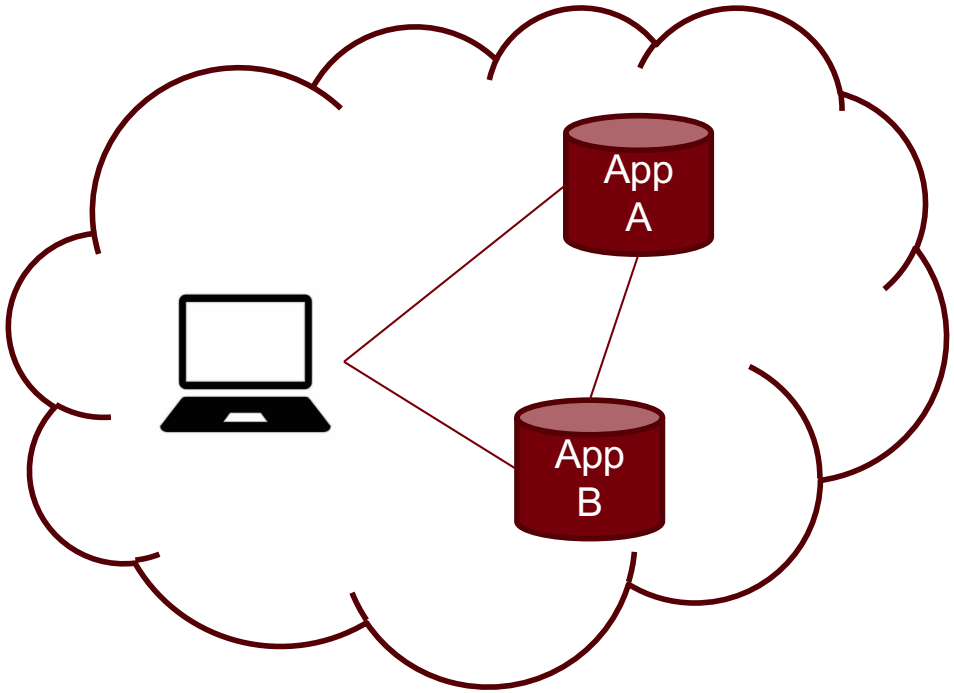
- Http & Https Mixed
  - Browser blocked content
- Invalid Certs or Certificate Authority
  - Failure to connect
- Clock skew (no or different NTP)
  - Oauth can fail (sometimes sporadically)
- Shared Reverse Proxy for several apps
  - Web resources (often javascript) load issues
- Localhost
  - Non-stable connections and link resources
- Lack of Fully Qualified Domain Names
  - Overly complex security as they are assumed on unique domains
- Filters on Reverse Proxies
  - Stripping of web headers or cookies can cause authentication/session issues
- Throttling
  - Failure of large feeds for reporting
- Load Balancing
  - Session changing while switching nodes causing inconsistent behavior
- Firewalled Network Segments
  - Servers unable to connect apps (even with clients having connectivity)

So how do we minimize this?

Standard Topology

Baseline Recommended Topology

- Basics of the Topology
  - Single Domain
  - Multiple Applications
  - Private Network
- The Details
  - Fully Qualified Domain Names
  - Valid Certs and Certificate Authorities
  - Standard Authentication
  - No advanced web security headers
    - *Check Reverse Proxy and App Server Settings*
  - (Encouraged) Reverse Proxies for Applications



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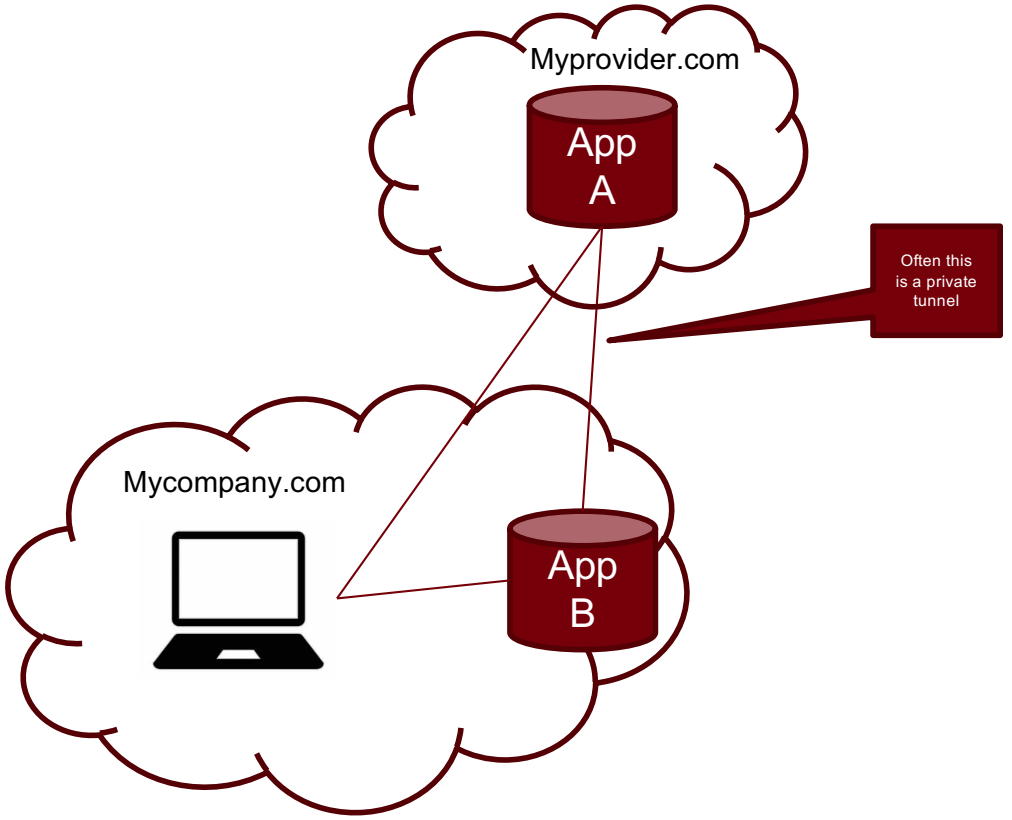
Topology Deviations (and Impacts)

(Virtual Private) Cloud Service Topology

- Basics of the Topology
  - Similar Structure
  - One Application in a Unique Domain Namespace

- The Details
  - Fully Qualified Domain Names
  - Valid Certs and Certificate Authorities
  - Management of same-site configuration
    - *SameSite=none*
    - *CSRF Token for Mutable interfaces*



The common issue without special configuration is broken login behavior (fails or flashes) because session tokens are not being shared in embedded frame contents

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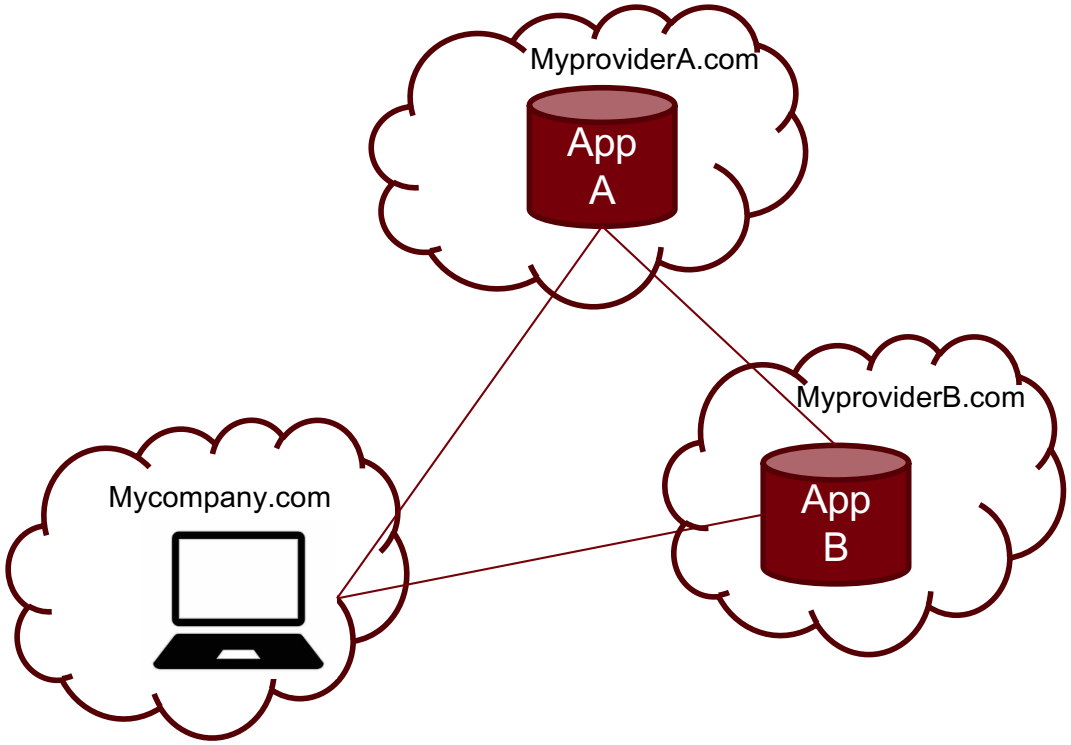
Multi Domain Cloud Service Topology

- Basics of the Topology
  - Multiple Domains
  - Likely Open Internet Accessible
    - *IT Security becomes*

- The Details
  - Each domain has unique security norms
  - SameSite issue must be addressed
  - Active security reviews
    - *APIs*
    - *Load Testing*
    - *Restrictive Headers*



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The Future of OSLC Deployments

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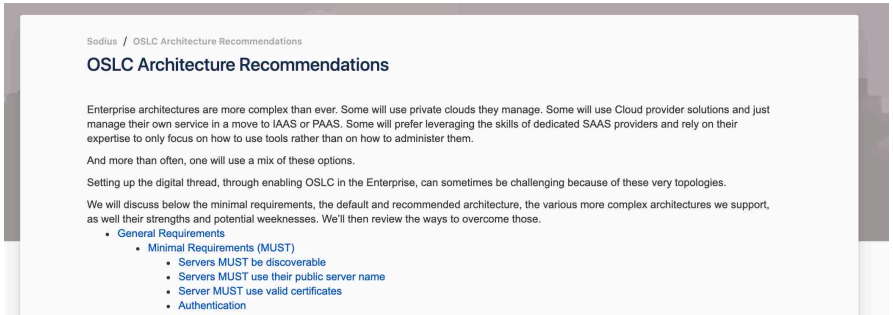
What is SodiusWillert doing about this?

- Education of our Users
  - Basics of OSLC
  - Basics of OSLC Architecture
    - *And Maintaining*
- Active Guidance
  - General Guidance
    - *Deployment & Persistent Architecture*
  - Product Specific Guidance
  - Symptom Based Diagnostic Practices
- Application Enhancements
  - Architecture Alignment for OSLC Extensions
    - *Tool Compatibility*
    - *Enterprise Support (Auth, Scale, Security)*
  - Error Handling & Messaging
    - *Error Details*
- Support Desk, Lab, and Knowledge Base



Making Deployments More Stable

- Architecture of your Applications
  - Long-Term Plan and Maintenance
    - *Reverse Proxies and Load Balancers*
  - Manage the support profile of
    - *Applications*
    - *Browsers*
    - *Providers*
- Plan your interaction patterns
  - Content Security Policy can be helpful
  - Controlling Network Paths
- Validate Application Security Practices
  - Authentication
  - Audit Controls

Thank You

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