RESTCONF API Migration

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RESTCONF Standards

- RESTCONF is a standard API for managing devices
  - Provides a RESTful API for devices managed by NETCONF
  - Like NETCONF, formal API definition is specified in YANG
  - Uses standard http methods (GET, PUT, POST, DELETE) to a RESTful API

- There are 2 standards for RESTCONF:
  - Initial version: defined by Internet Draft authored by Biermann et al. This version is referred to as Bierman-draft
  - Current version: defined by RFC 8040

- RFC 8040 is NOT backwards compatible with Bierman-draft, creating a challenge when migrating from Bierman-draft to RFC-8040.

Bierman-draft vs RFC 8040 URI format

Use Case	Bierman-draft URI	RFC 8040 URI
Get service data – config tree	/restconf/config/GENERIC-RESOURCE-API:services/service/{service-instance-id}	/rests/data/GENERIC-RESOURCE-API:services/service={service-instance-id}?content=config
Get service data – operational tree	/restconf/operational/GENERIC-RESOURCE-API:services/service/{service-instance-id}	/rests/data/GENERIC-RESOURCE-API:services/service={service-instance-id}?content=nonconfig
RPC: service topology operation	/restconf/operations/GENERIC-RESOURCE-API:service-topology-operation/	/rests/operations/GENERIC-RESOURCE-API:service-topology-operation/

OpenDaylight Support for RESTCONF

- OpenDaylight has supported both versions of RESTCONF since their Sodium release.

- OpenDaylight is deprecating support for Bierman-draft in their Sulfur release, and removing it in the following release (Chlorine).

- This means that ONAP needs a migration strategy to RFC 8040.

OpenDaylight / ONAP release alignment

| ONAP Release	OpenDaylight Release
Guilin	Sodium
Honolulu	Aluminum
Istanbul	Silicon
Jakarta	Phosphorus
Kohn	Sulfur
London	*Chlorine or Argon, TBD*

ONAP Kohn : OpenDaylight Release Alignment

- OpenDaylight Chlorine release schedule aligns well with ONAP Kohn schedule.

- HOWEVER, Chlorine does not support Bierman-draft API.
  - Recent ONAP use cases have been using RFC 8040 format.
  - However, older use cases – including some used for gating – still use Bierman-draft.

- So, we decided to update to Sulfur release in Kohn to allow time to plan orderly migration from Bierman to RFC 8040.

Alternatives Considered

1. Announce Bierman deprecation in Kohn release and removal in London release.
   - Same strategy as OpenDaylight community.
   - Would likely mean that we would need to provide long term support of Kohn release to address interfaces that cannot migrate to RFC 8040.

2. Implement new microservice to map Bierman API to RFC 8040.
   - This would be fairly complex, since mapping requires detailed knowledge of interface data structure.

3. Take over support for OpenDaylight's Bierman implementation
   - Copy ODL Sulfur version of Bierman API code to new CCSDK repository and maintain it ourselves.
   - Potential license issue, since OpenDaylight is published under a different license than ONAP (Eclipse vs Apache)

SDNC Architecture – Alternative 2

- Add nginx in front of SDNC to route based on URI
  - RFC 8040 routes to OpenDaylight-based controller
  - Bierman-draft routes to new RESTCONF Adaptor microservice

- RESTCONF Adaptor
  - Receives interface in Biermann-draft format and translates to RFC 8040 format
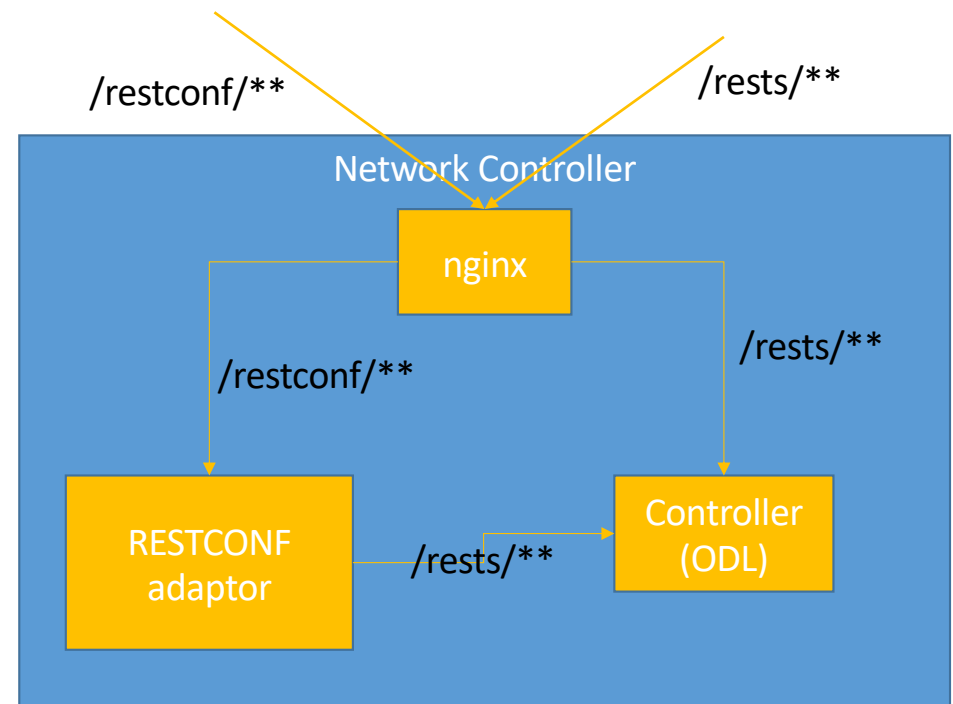
SDNC Architecture – Alternative 3

- Same as current architecture
  - Bierman API support implemented as a karaf feature within OpenDaylight karaf container

/restconf/**   /rests/**

Network Controller

Controller
(ODL)
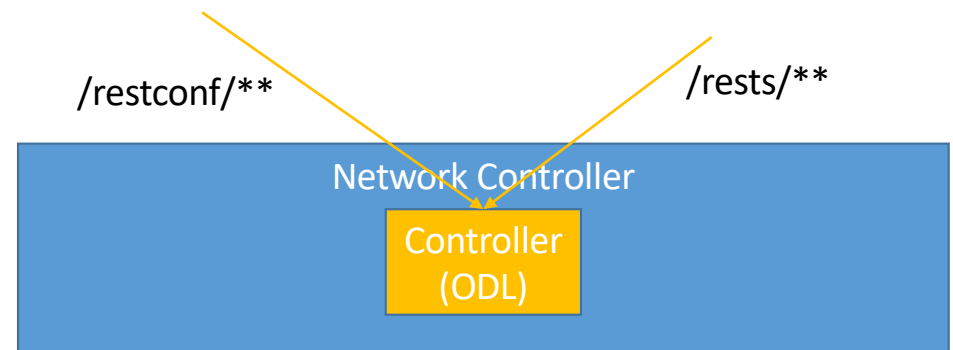
Proposed Migration Plan

- ## ONAP Kohn :
  - Upgrade to OpenDaylight Sulfur
  - Begin work to support Bierman interface
    - Either RESTCONF adaptor or port existing ODL Bierman karaf feature to ONAP

- ## ONAP London:
  - Upgrade to OpenDaylight Chlorine or Argon (TBD, based on schedule alignment)
  - If RESTCONF adaptor strategy is chosen:
    - Introduce RESTCONF adaptor
    - Update nginx router to route Bierman-draft API to RESTCONF adaptor
  - If Bierman karaf feature strategy is chosen:
    - Introduce new repo in CCSDK containing current ODL Bierman API karaf feature
    - Install CCSDK version of Bierman API in SDNC's ODL karaf container

Fallback Plan

- If replacement strategy for Bierman is not ready for ONAP London release, fallback plan would be:
  - Run 2 instances of SDNC:
    - ONAP Kohn image
    - ONAP London image
  - Direct RFC 8040 API to London image, and Bierman-draft to Kohn image

/restconf/**   /rests/**

Network Controller

nginx

/restconf/**   /rests/**

Controller (Kohn)   Controller (London)