LF NETWORKING

LFN Developer & Testing Forum

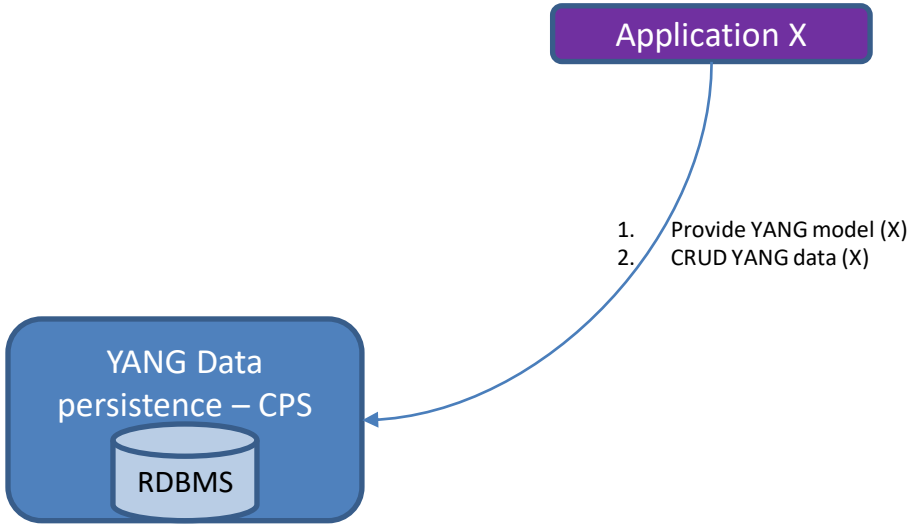
CPS MVP for E2E Network slicing

Honolulu scope

Tony Finnerty, Toine Siebelink (04 February 2021)

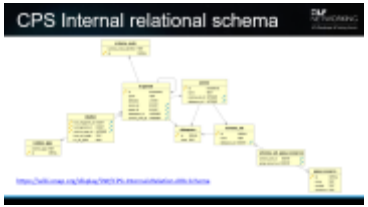
CPS, A generic YANG data store

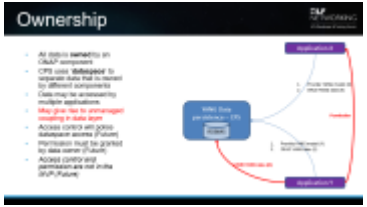
- The YANG modules provide the schema
- The schema is used to validate data on write
- The DB technology may be swapped out
- The default (reference) implementation uses PostgreSQL 13.1



Future:

- Backup/Restore
- Access control
- Ownership

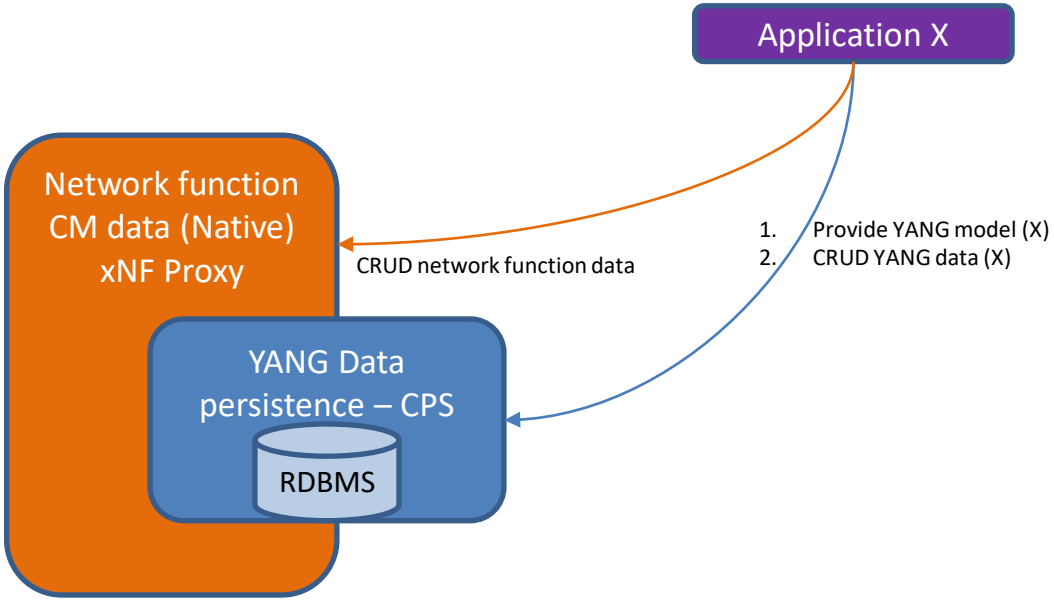




Network function CM data (native)

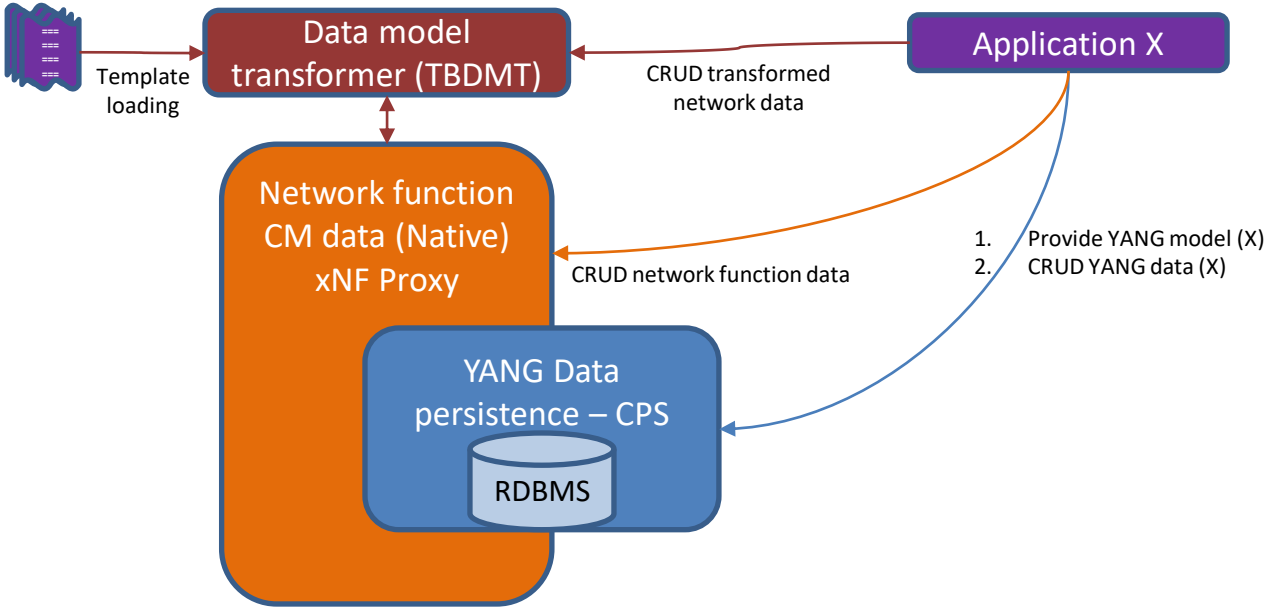
- Provide a cache of CM data from network functions in ***as-close-to-native*** representation as possible
- AAI Sync (inventory)
- SDC integration (YANG modules)
- Initial sync with network function
- Incremental sync with network function
- Allows data recovery
- Allows data auditing

- xNF Proxy owns cache of network function CM data in ONAP
- Provides access to data via dedicated interfaces
- Co-deployed with CPS for performance reasons



Data model transformation (template based)

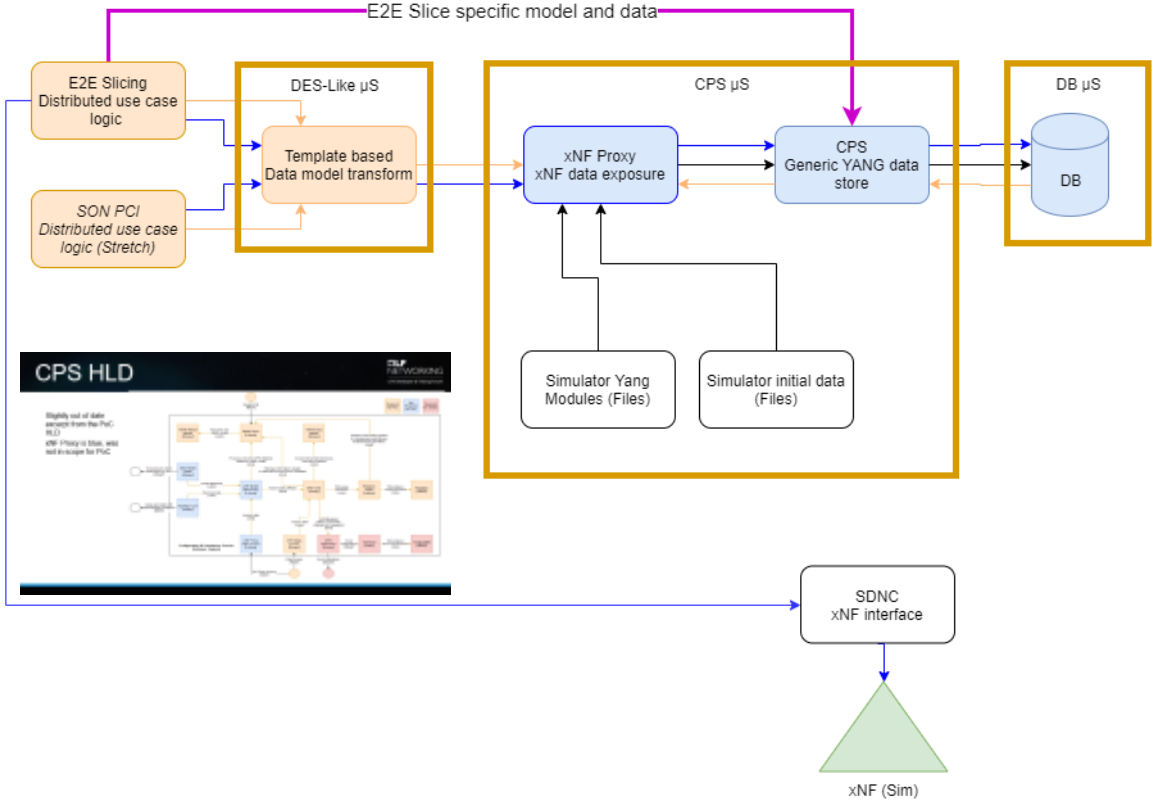
- Provide applications with a modified view of network function CM data
- Loads template(s) identified by
  1. Use case
  2. Type of network function
- Executes templates(s) towards network function instances



CPS MVP for E2E Network Slicing – Honolulu

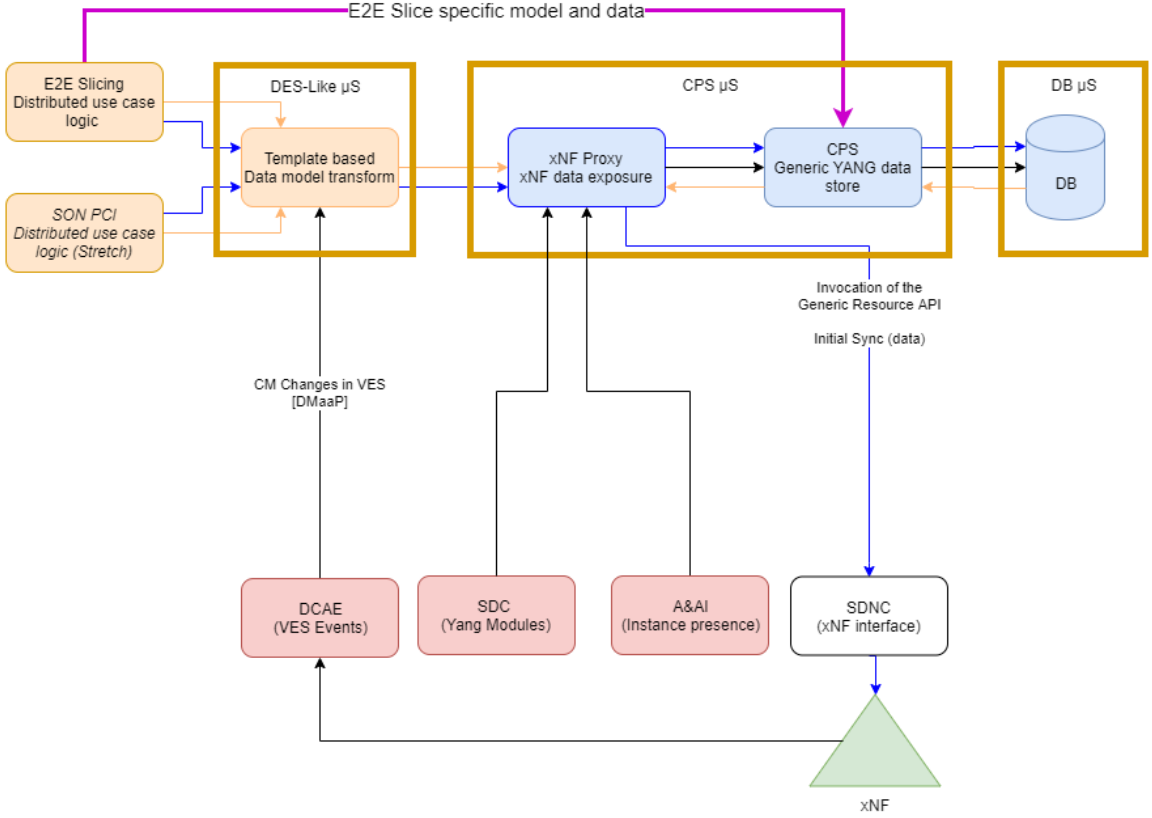
- The integration between SDC/AAI and xNF Proxy is deferred for Honolulu.
- The model, initial data and xNF instances will be hard-coded (or file configured) in xNF Proxy – Coordinated
- Application interfaces directly with controller for CM changes

- Single anchor (avoids refactoring simulator model)
- Data model transform templates will address network function within the simulator data



CPS – Future… Istanbul and beyond

- Integration between SDC/AAI and xNF Proxy for models and inventory.
- Sync vis SDNC for initial data loading
- CM change propagation via the controller
- Data updates via DMaaP and DCAE for VES encapsulated CM updates



CPS MVP Models


```
module: cps-cavsta-onap-internal
  +--rw ran-coverage-area
     +--rw pLMNIdList* [mcc mnc]
     |  +--rw mcc     Mcc
     |  +--rw mnc     Mnc
     +--rw coverage-area* [coverageArea]
        +--rw coverageArea            string
        +--rw coverageAreaTAList* [nRTAC]
           +--rw nRTAC           Tac
           +--rw taCellsList* [cellLocalId]
              +--rw cellLocalId     int32
```

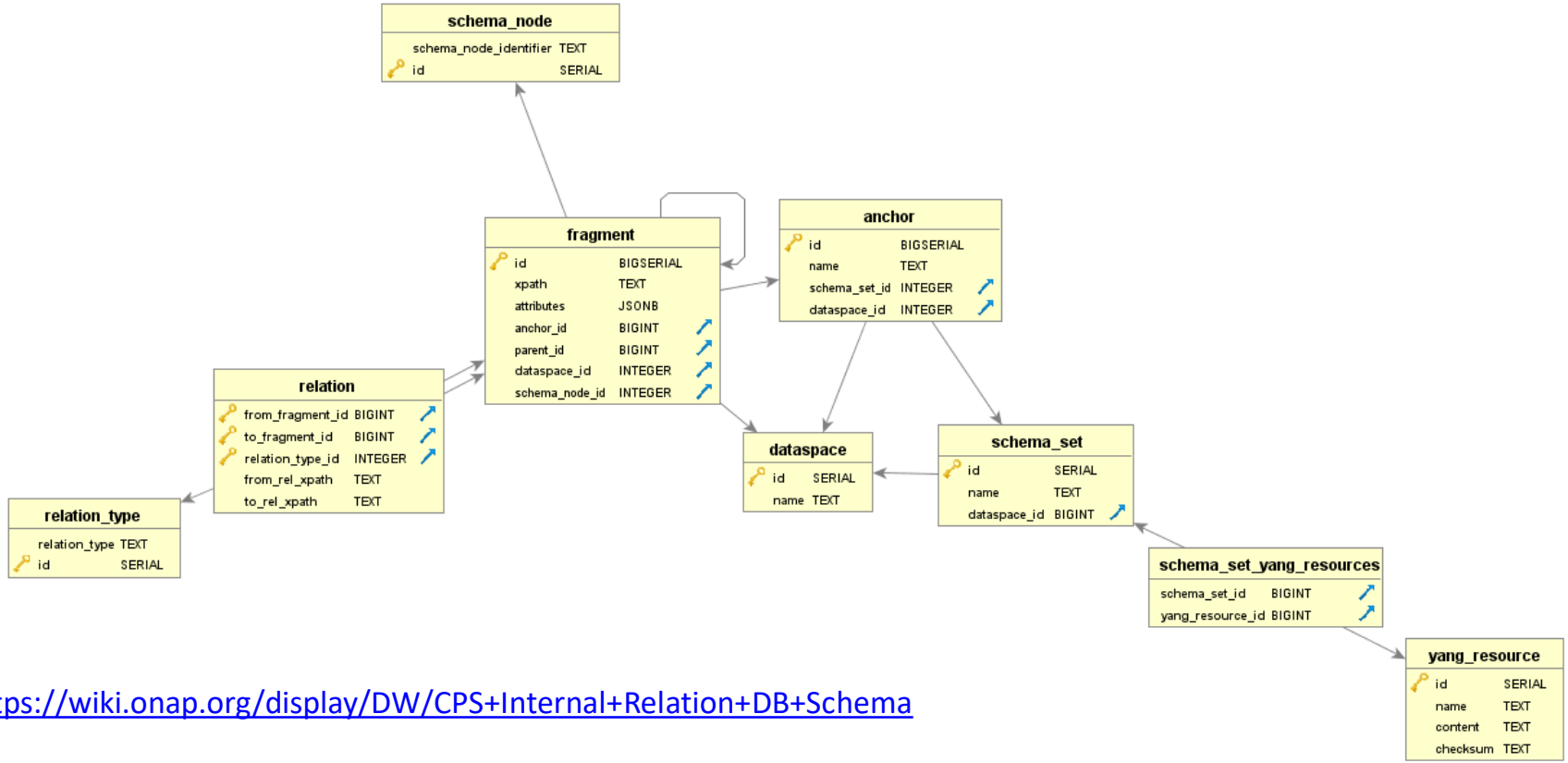
```
module: cps-ran-inventory
  +--rw ran-inventory
     +--rw rannfnssiid?          string
     +--rw sliceProfilesList* [sliceProfileId]
     |  +--rw sliceProfileId           string
     |  +--rw sNSSAI?                  string
     |  +--rw maxNumberofUEs?          int64
     |  +--rw latency?                 int64
     |  +--rw uLThptPerSlice?          int64
     |  +--rw dLThptPerSlice?          int64
     |  +--rw maxNumberofConns?        int64
     |  +--rw uEMobilityLevel?         string
     |  +--rw resourceSharingLevel?    string
     |  +--rw coverageAreaList*        string
     |  +--rw pLMNIdList* [mcc mnc]
     |     +--rw mcc     Mcc
     |     +--rw mnc     Mnc
     +--rw subnetStatus?         string
     +--rw nsstid?               string
     +--rw slicetype?            string
     +--rw isshareable?          string
```

- E2E Network Slicing models
  - See inserts
- Network (simulator) model
  - ran-network@2020-08-06.yang

LF
NETWORKING
LFN Developer & Testing Forum
Q&A

LF
NETWORKING
LFN Developer & Testing Forum

CPS Internal relational schema

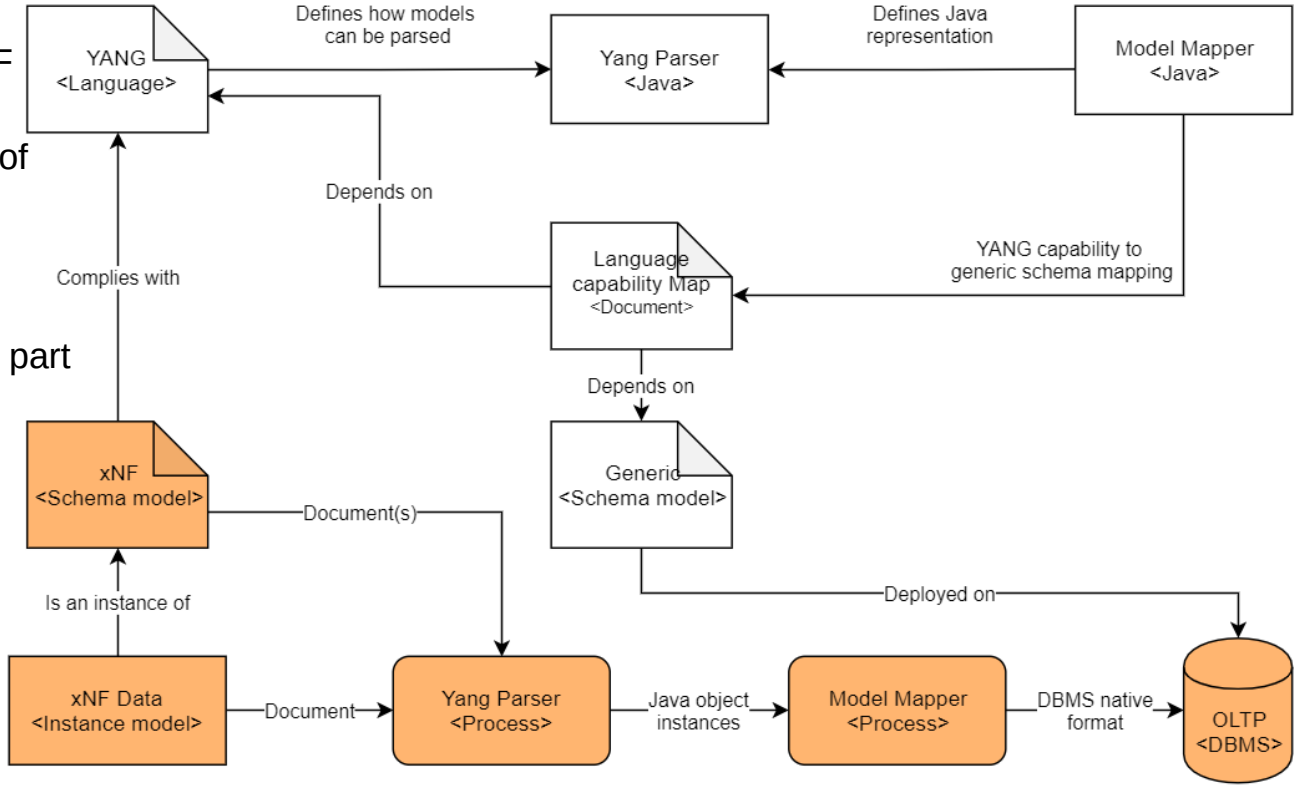


https://wiki.onap.org/display/DW/CPS+Internal+Relation+DB+Schema

YANG to relational schema

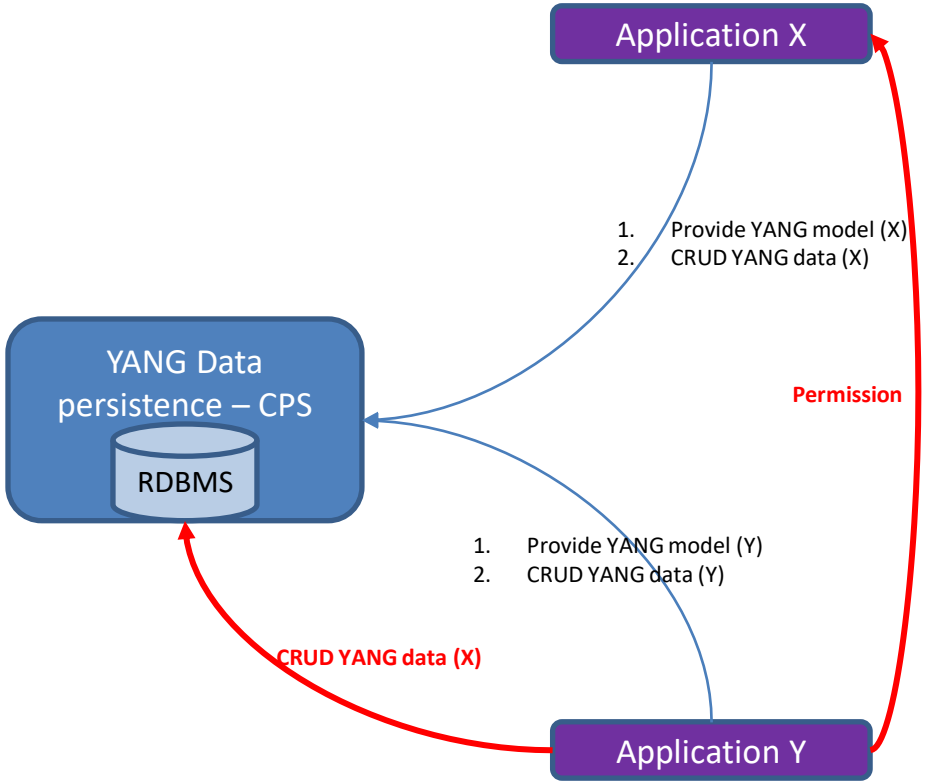
- ✓ Zero code support for xNF CM data
- ✓ ONAP LCM free addition of xNF CM data
- ➢ Faster flexible features

- Orange/shaded items are part of the runtime
- Yang tools provides:
  - Yang Parser <Java>
  - Yang Parser <Process>
- CPS Core/RI provides:
  - Model Mapper <Java>
  - Yang Mapper <Process>



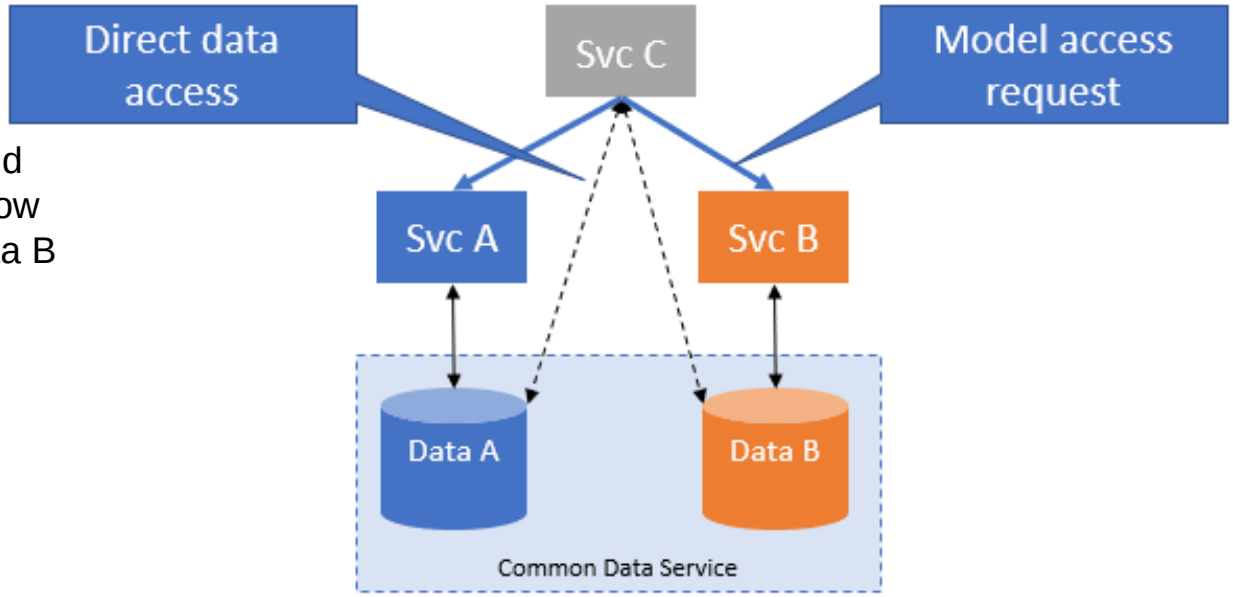
Ownership

- All data is **owned** by an ONAP component
- CPS uses '**dataspace**' to separate data that is owned by different components
- Data may be accessed by multiple applications
- May give rise to unmanaged coupling in data layer
- Access control will police dataspace access (Future)
- Permission must be granted by data owner (Future)
- *Access control and permission are not in the MVP (Future)*



Data access and ownership

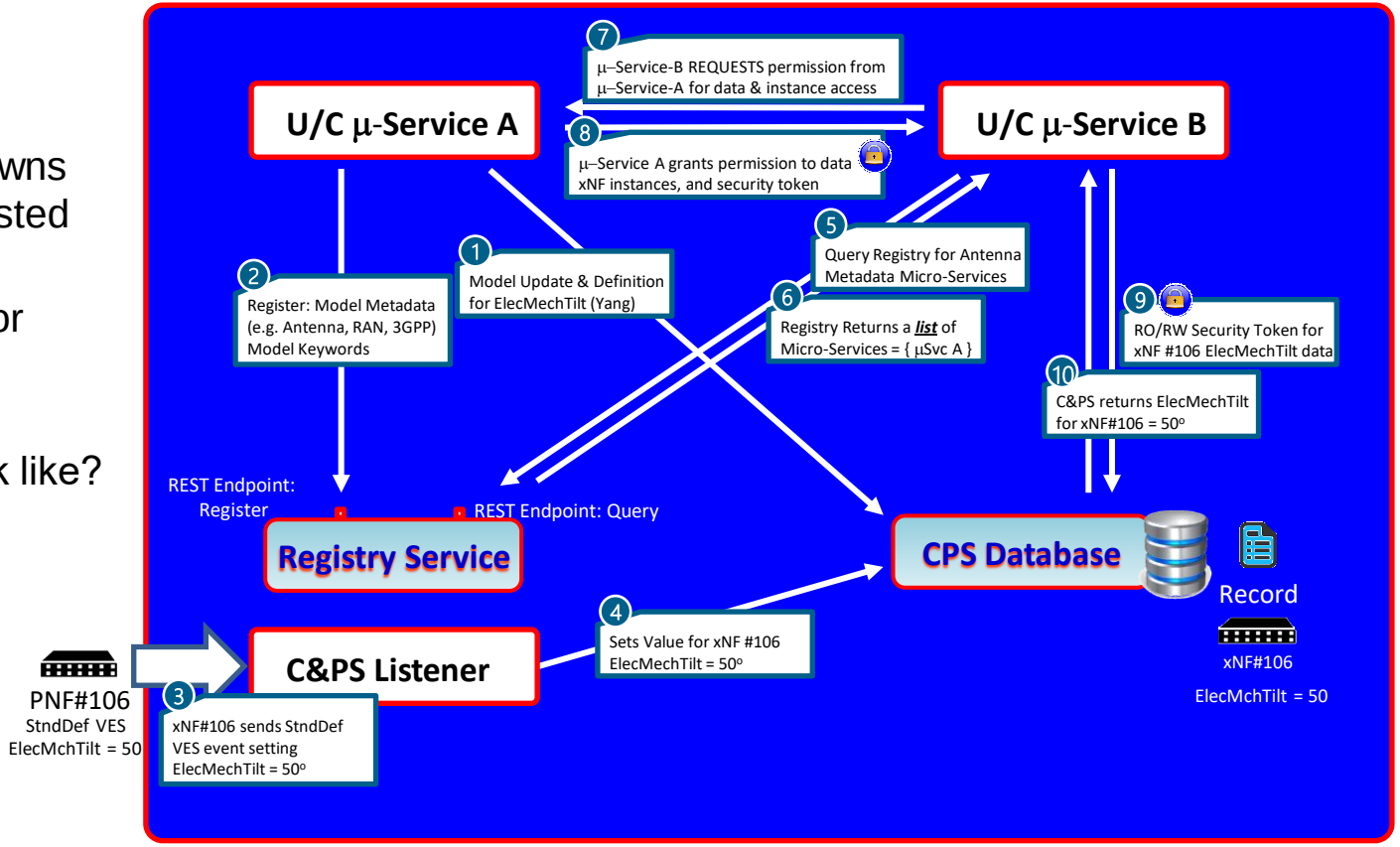
- Svc A owns Data A
- Svc B owns Data B
- Svc C must request permission from Svc A and Svc B before CPS will allow access to Data A and Data B respectively



Data registry service flow

Future work

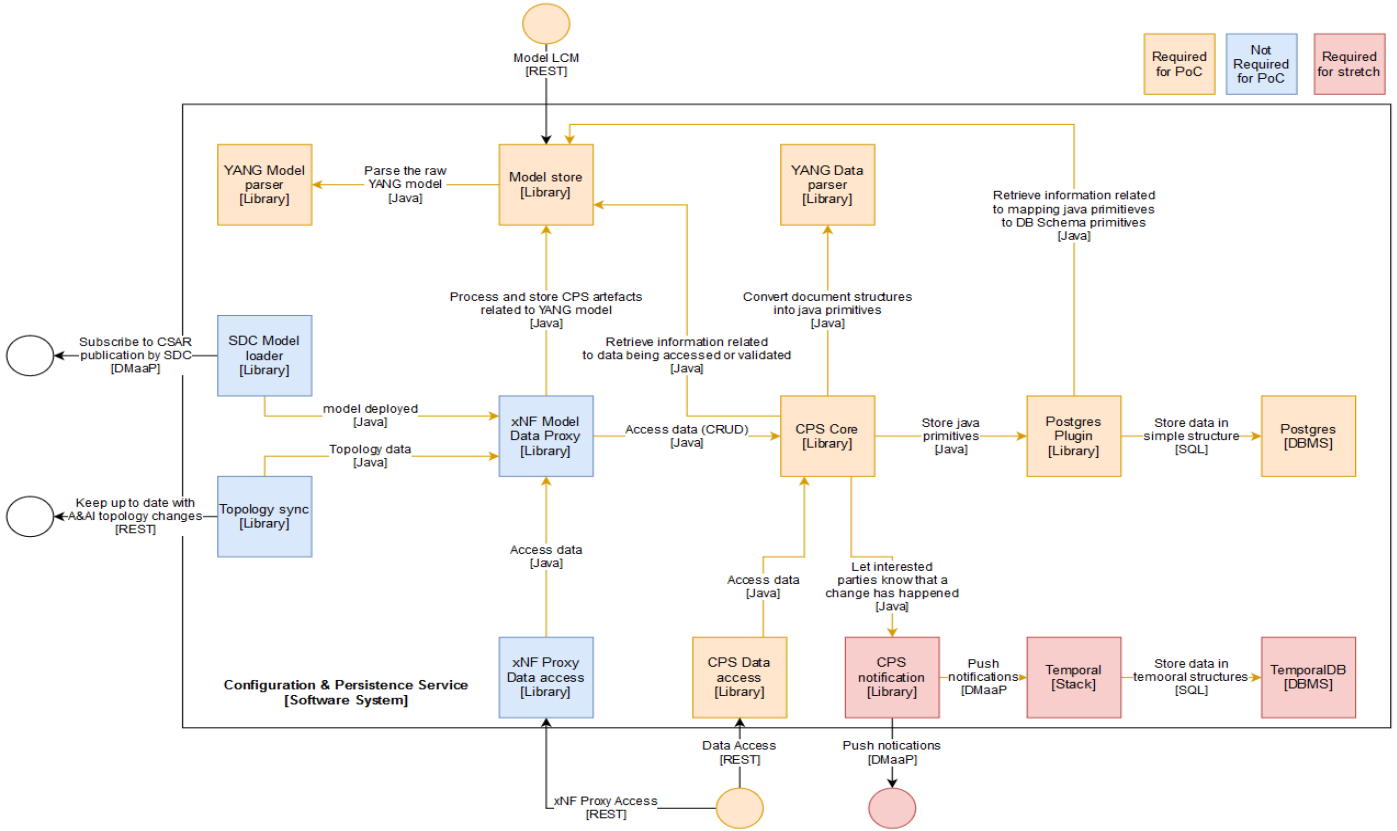
- Which service owns data I am interested in?
- How can I ask for permission?
- What does a ‘permission’ look like?



CPS HLD

Slightly out of date excerpt from the PoC HLD

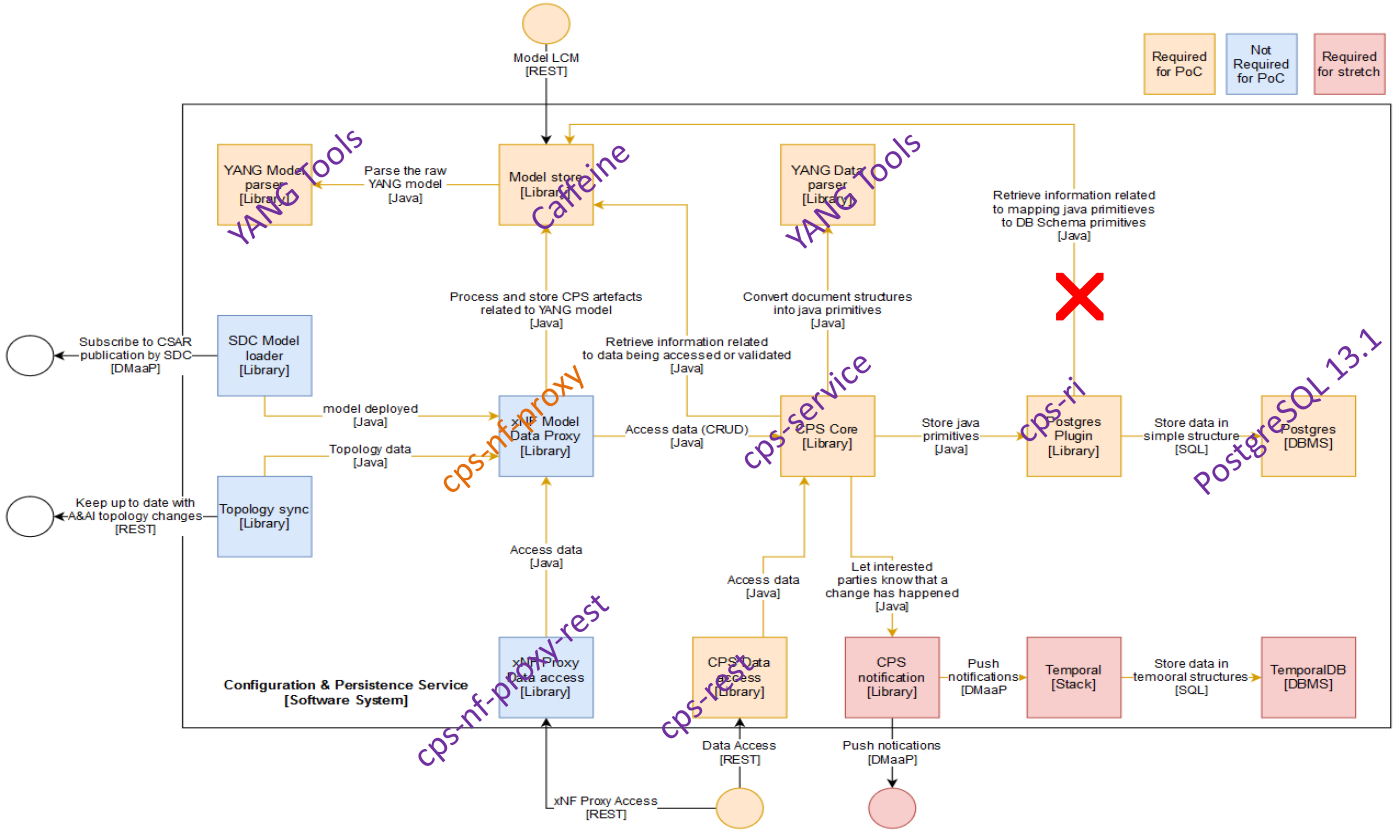
xNF Proxy is blue, was not in scope for PoC



CPS HLD

Slightly out of date excerpt from the PoC HLD

xNF Proxy responsibility is blue, minimal implementation in scope for Honolulu



Concepts

- Dataspace is a logical separation of data
  - Used in conjunction with the ‘owner’ concept. xNF proxy will not expose this.
- Anchor is a logical separation of data within a dataspace
  - Used to distinguish (xNF) instances with of the same model
  - Relates directly to the xNF id in AAI

- For more CPS concepts see the linked presentation below: