CPS Model Driven PoC

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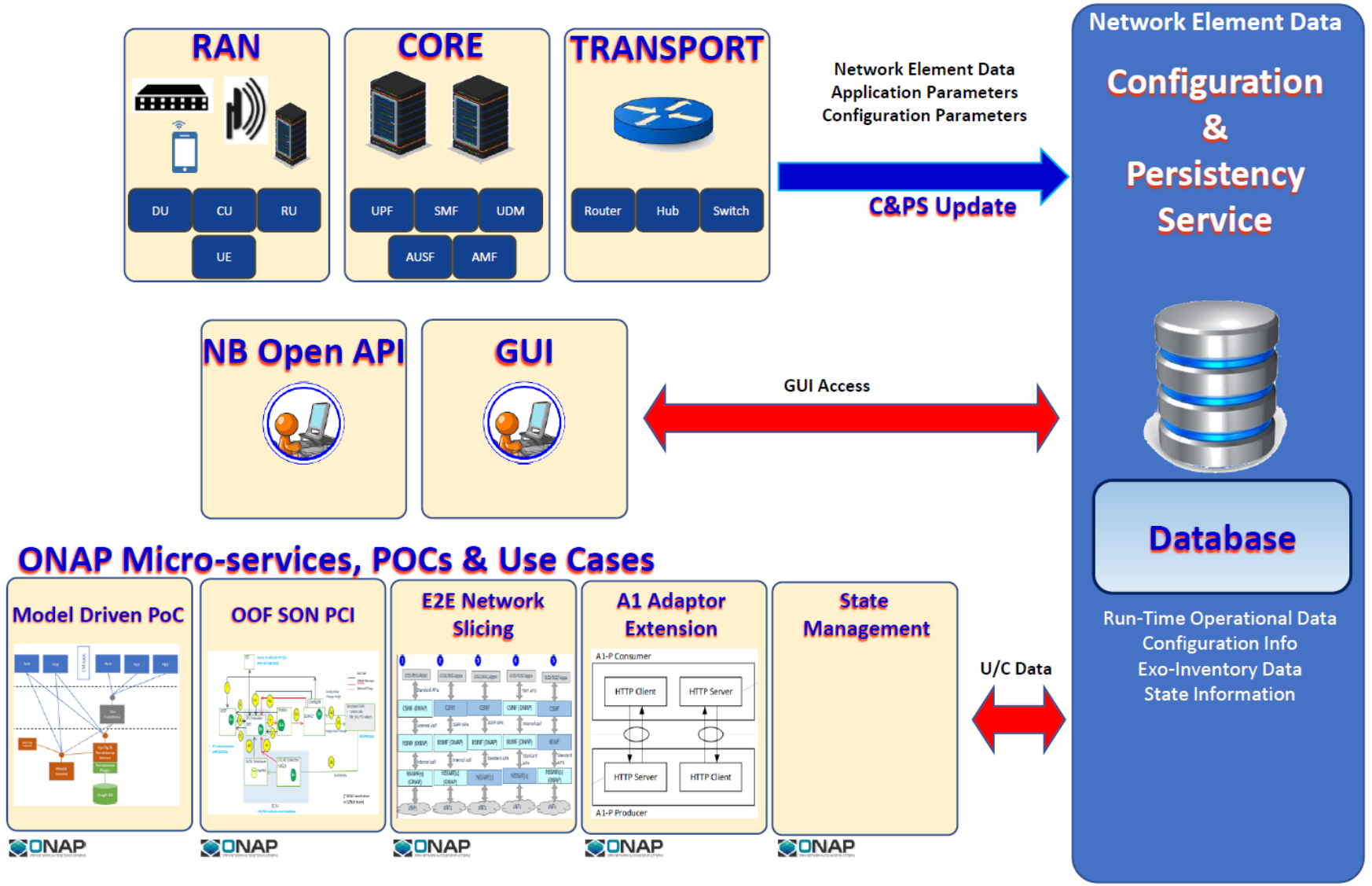
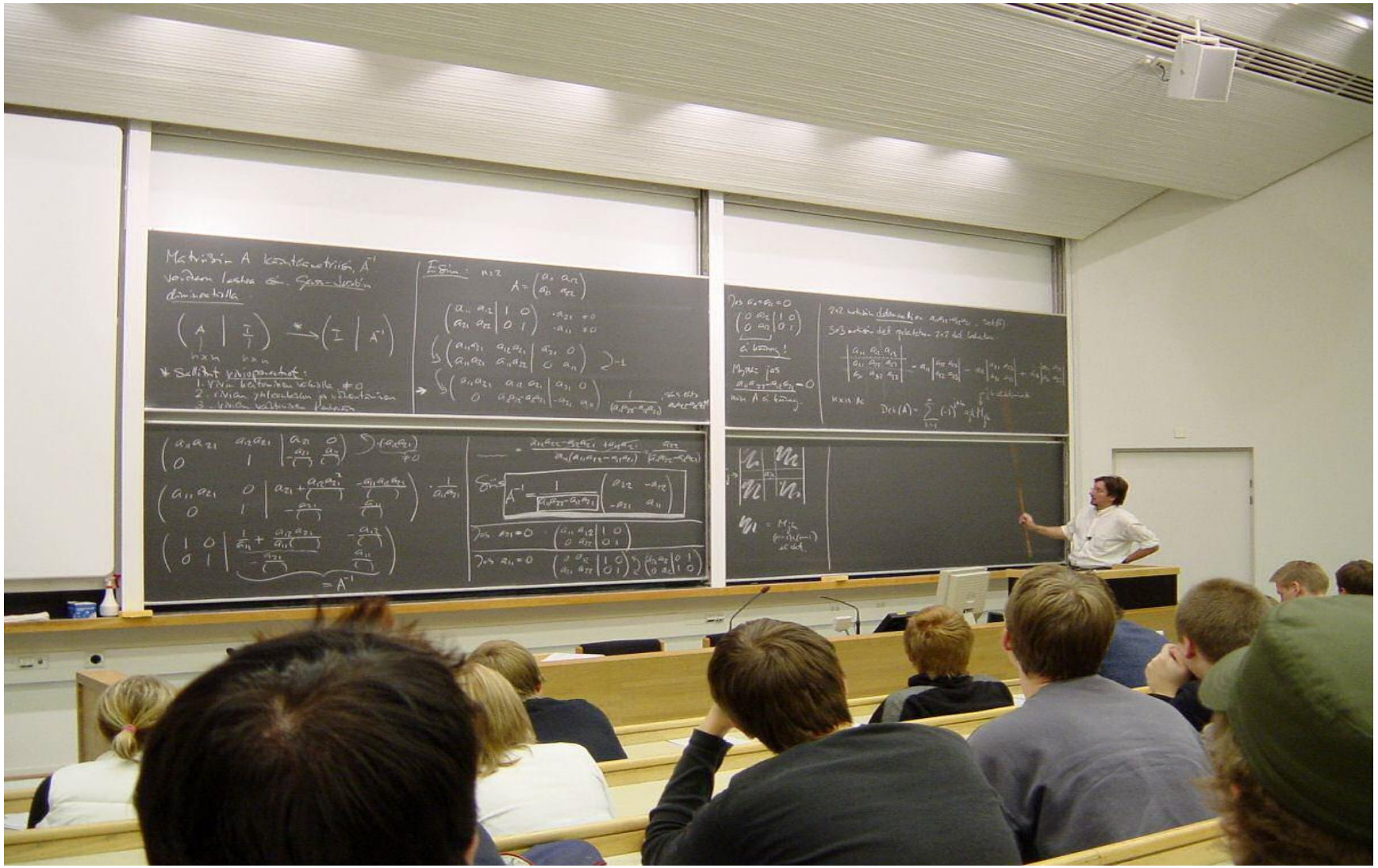
Heterogeneous networks (that evolve!)

- Multiple vendors providing equipment / xNF
- Several telecom networks one ONAP platform
- Evolution of xNF and network standards
- ONAP applications and use cases competing for access to the same CM data



Blackboard pattern (for many consumers)

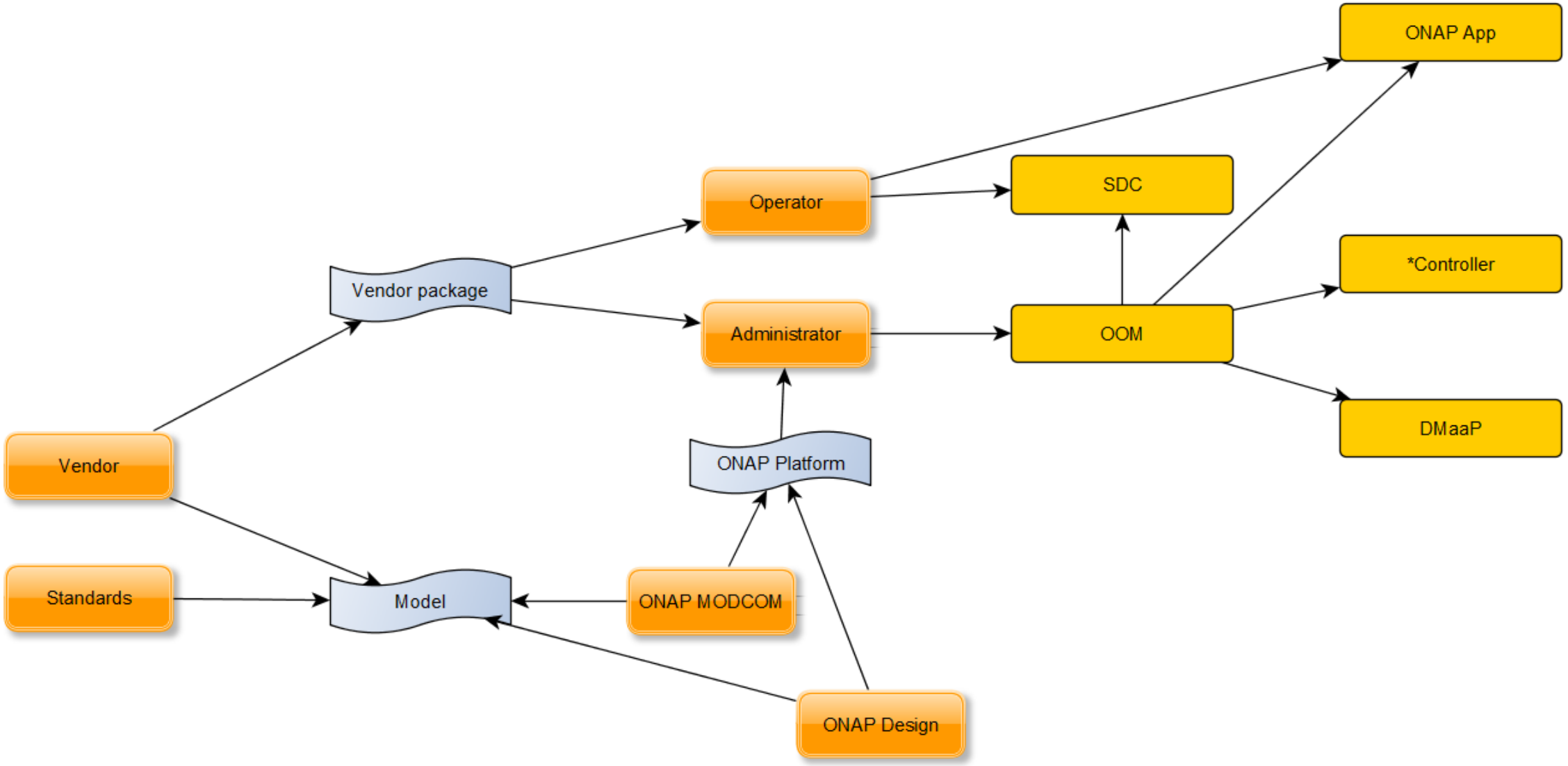


YANG (Netconf modelling language)

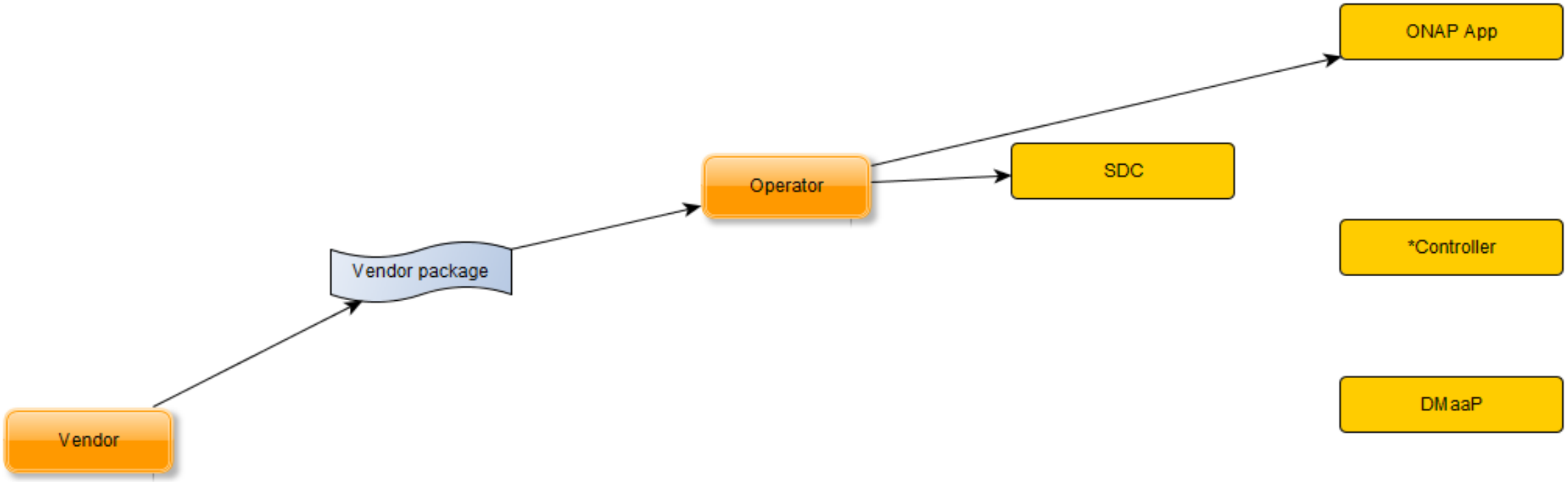
- Industry momentum towards YANG
- IETF RFC, widely supported
- Superset of most language capabilities

- Primary input and native language of the CPS
  - Other languages would need to be translated before being deployed

ONAP Design time model handling



Runtime deployment of models



Model driven safe access to data

- Model defines constraints to the data
- CPS enforces those constraints during access

- Developer efficiency
- Consistency of approach
- Lower maintenance costs; higher quality applications

Target

- [Base scope] Read/write persisted Configuration Management data:
  - defined by xNF, published as YANG
  - Models deployed @ runtime with no ONAP platform impacts or LCM events
  - Show the benefits in terms of constraint validation, access and upgrade

- [Stretch target] Adapt behaviour of CPS on read/write based on information in the model
  - Change notification emissions
  - Interaction with temporal data store
  - Volatile xNF data read-through (e.g. state data)

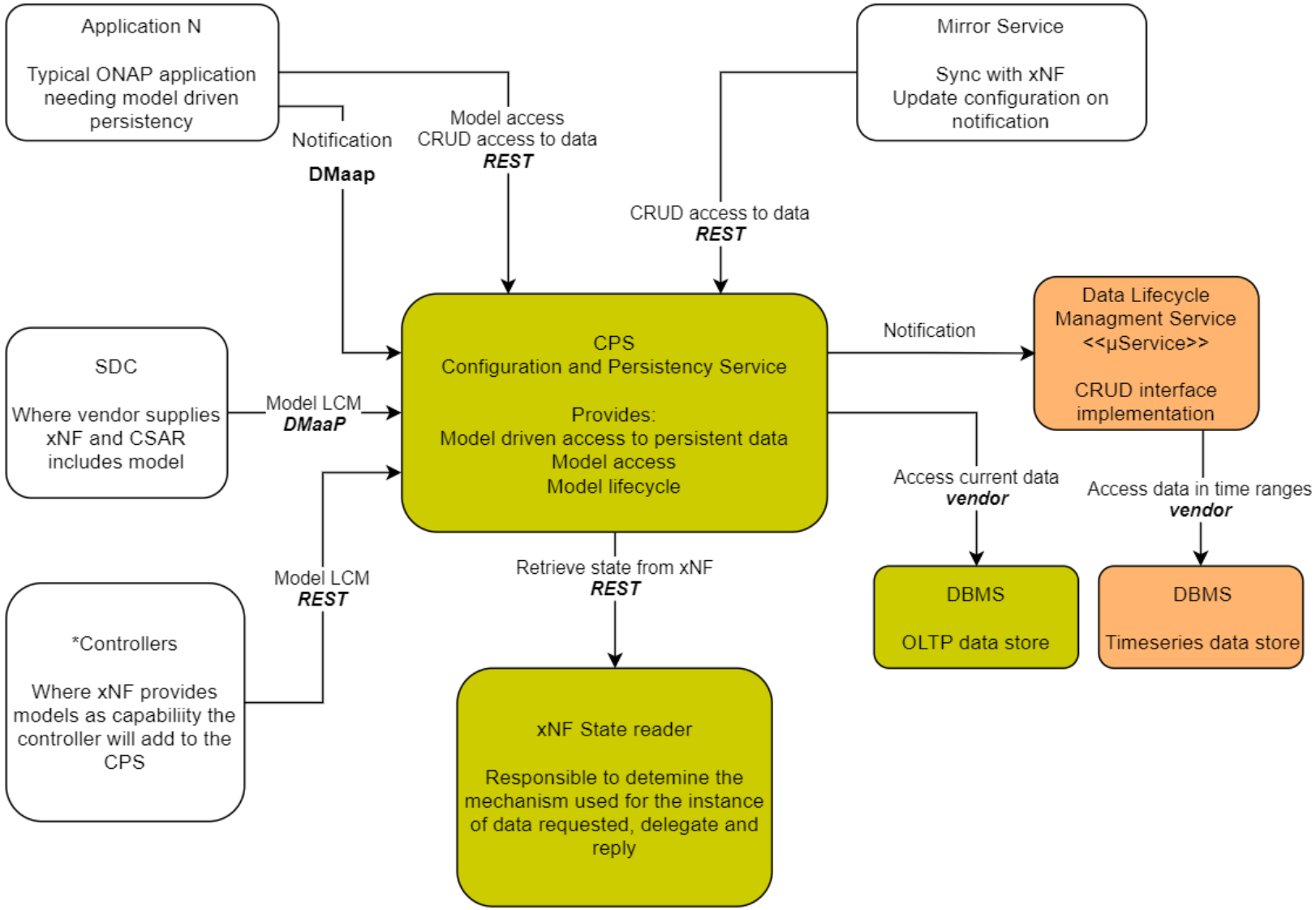
- Seed code for stand-alone CPS project in ONAP

Proof points for base scope

- Demonstrate Create/read operations using YANG fragments against a CPS backed by very simple schema / schema-less repository
- Demonstrate ability to deploy / upgrade YANG fragments at runtime
- Demonstrate CPS behavior driven by YANG model
- Provide architecture vision and roadmap for a target architecture, supported use cases, non-functional requirements towards an ONAP Project

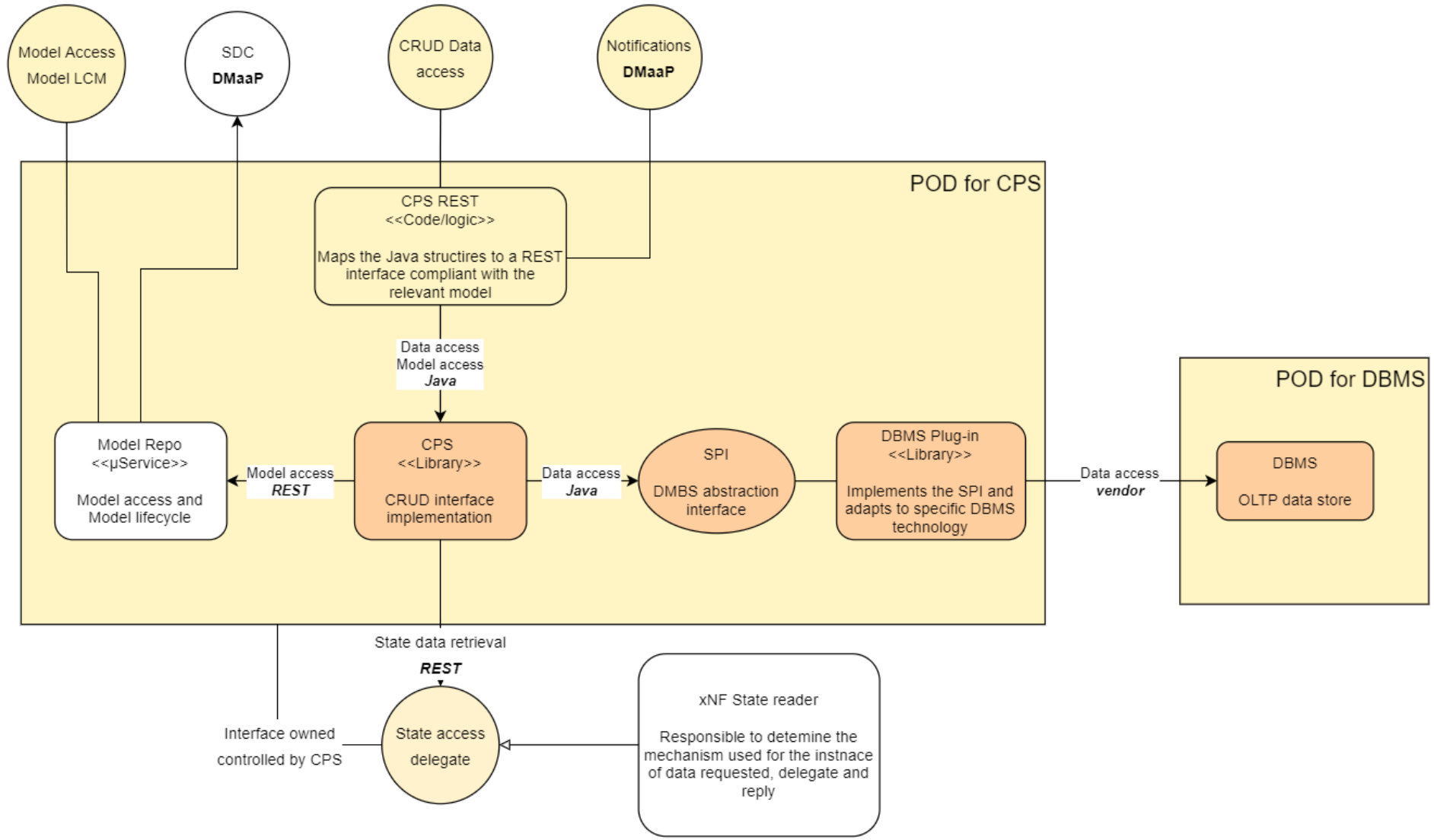
Context

- Models provided by SDC (and controllers)
- Applications query models to take advantage of safe data access
- OLTP is primary/first focus
- State (volatile) pass-thru for convenience
- Other DB technologies: loosely coupled via model driven change notifications

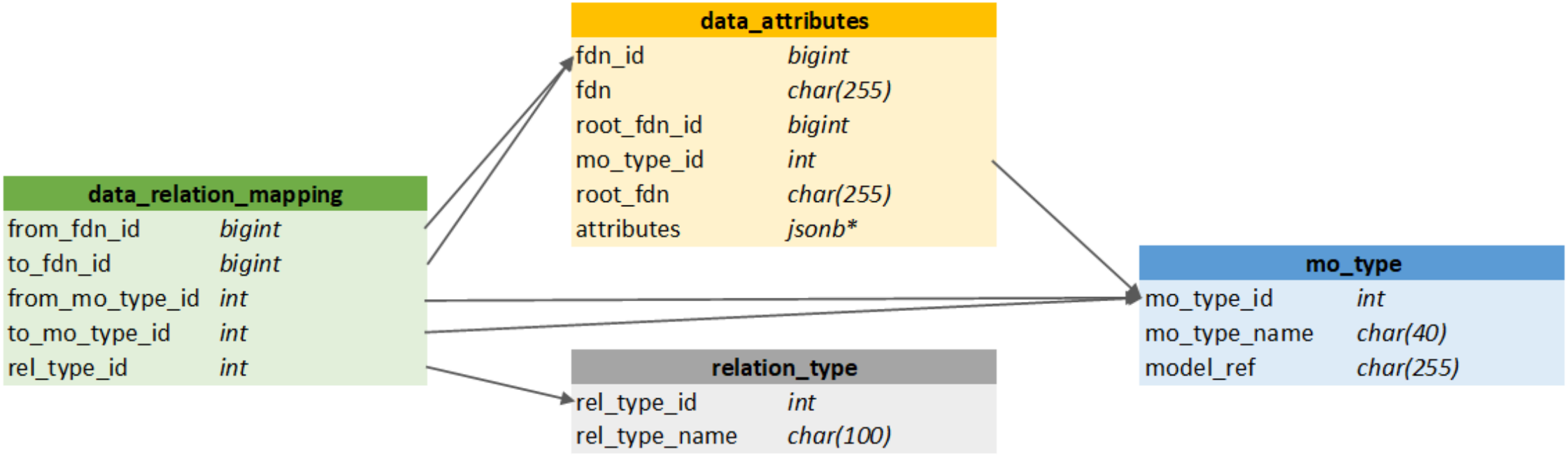


Main interfaces and modules

- Sample deployment view
- Core functionality and REST interface are separate modules
- DBMS access via a Service Provider Interface
- Model handling will depend on interfaces and type safety – does not need to be in POD
- xNF State reader is for information only, not likely to be part of PoC
- DBMS is in own POD



Example of generic schema for relational DB

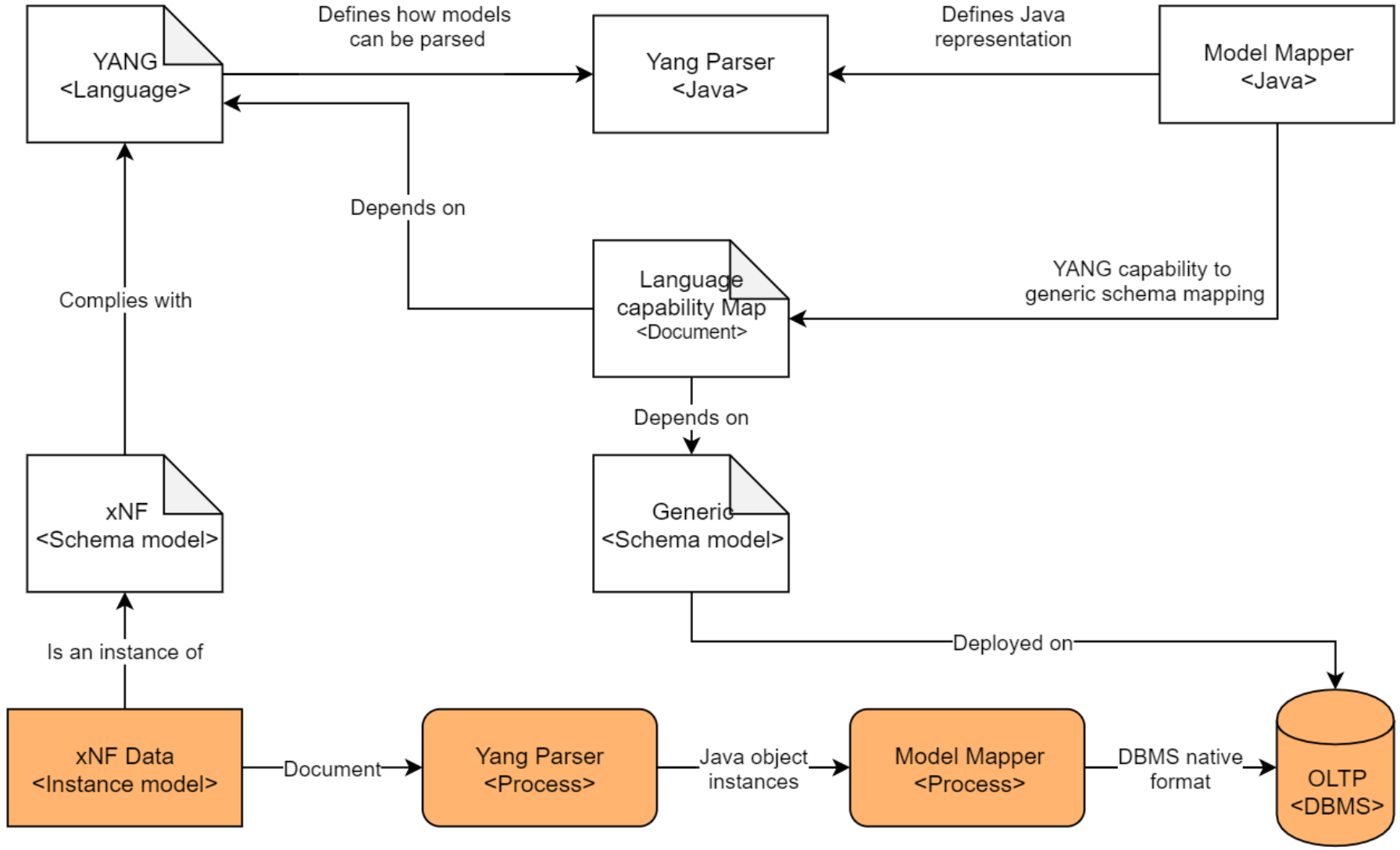


jsonb* actual type will depend on DB choice

Models at design and runtimes

- The runtime, at the bottom, involves parsing, mapping and storing – this is the CPS
- Design time activity is once off for each language to be supported
- Parsing coupled with language (YANG)
- Mapping coupled with language and internal representation (Generic schema)
- Generic schema coupled with DBMS technology
- CPS includes parsing and mapping
- The java representation (in Yang Parser) may be used directly to avoid serialization

- Not shown: CPS; SPI; Model repo; plug-ins; interfaces



Q&A

- I’ve spoken enough – now it’s your turn!