I2RS Related/Relevant Yang Models Currently in Use
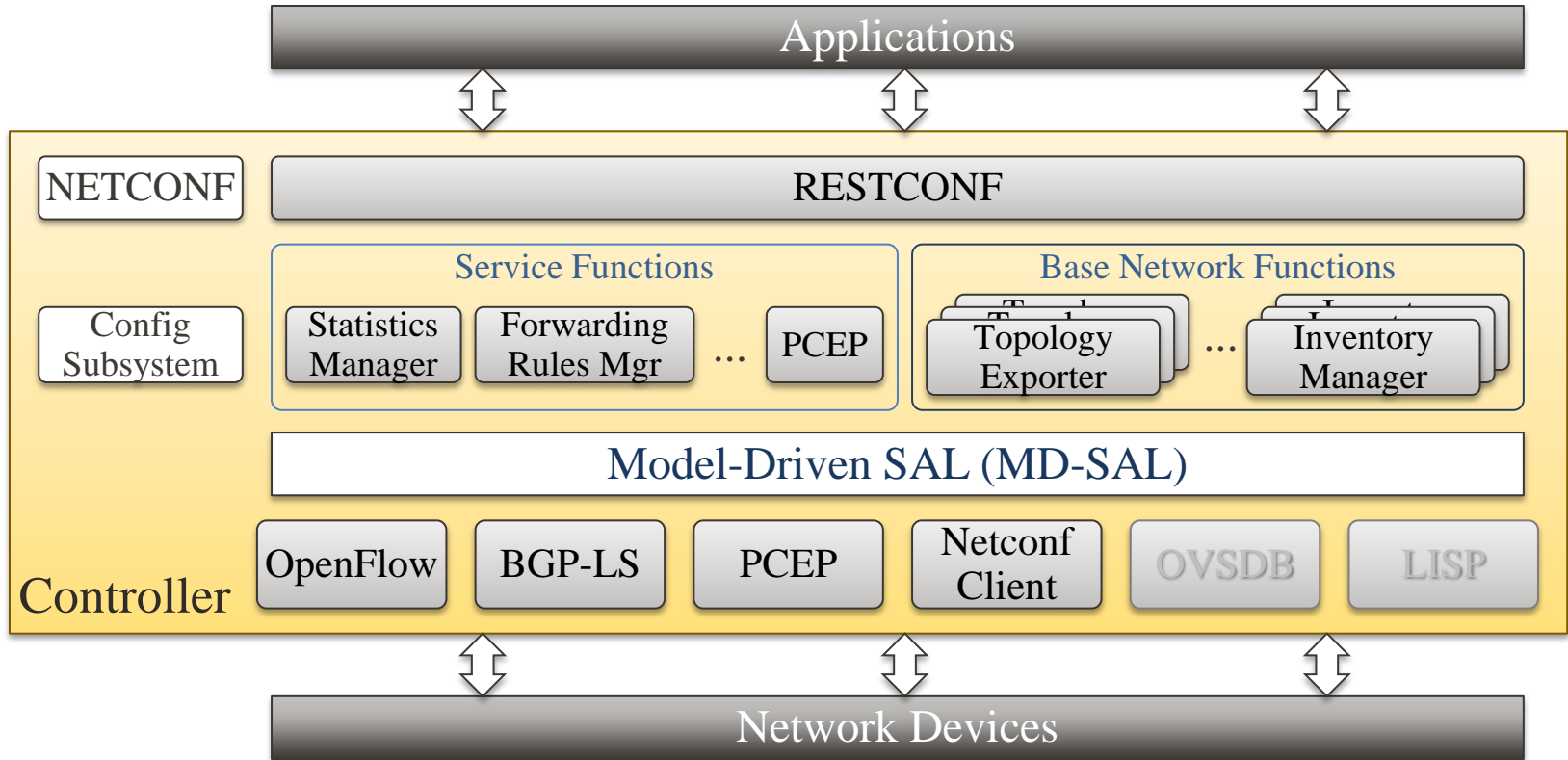
March 2014

Robert Varga, Anton Tkacik, Jan Medved

Agenda

- Architecture
- Why YANG
- What Models
- Inventory model
- PCEP protocol model

Architecture

Why YANG

- Network device management:
    - SNMP
    - TL1
    - CLI, proprietary protocols
    - NETCONF
- Extensible DDL
    - XML Information Set
    - Augments, Extensions
- Data-dependent structure
    - "when" statement
- Early validation
    - Ranges, "must" statement
- Backwards compatible (with SMIv2)
- Standardized models being worked on

What Models

- ~110 models defined in OpenDaylight
- https://wiki.opendaylight.org/view/OpenDaylight_Controller:MD-SAL:Model_Reference
- 3 models from RFCs
  - RFC6021
  - RFC6022
- 8 models from current drafts
  - draft-clemm-i2rs-yang-network-topo
  - draft-ietf-netmod-iana-afn-safi
  - draft-ietf-netmod-iana-if-type
- ~10 models dealing with IETF protocols (BGP, PCEP)
- ~27 models dealing with OpenFlow (1.0, 1.3)
- ~35 internal wiring models
- ~15 conceptual prototypes

Inventory model

- Represents manageable endpoints connected to controller
- Simple base model, only skeleton concepts
  - Node – manageable endpoint, logical node
  - Node Connector – connection point present on logical node (interface, port, etc.)
- Extended by technology-specific models
  - Flow-capable Node for OpenFlow 1.3
    - Capabilities
    - Flow tables
  - NETCONF Node
    - Capabilities
    - Pass-through access to the underlying device

PCEP protocol model

- Message-level model of PCEP
  - Based in part on draft-cmfg-pce-pcep-grammar
  - RFC5440, RFC5441, RFC5455, RFC5521, RFC5557
  - draft-ietf-pce-stateful-pce augmentation-{02,07}
  - draft-{crabbe,ietf}-pce-pce-initiated-lsp-00 augmentation
- Message is a Notification
- Augmentation of topology model with list of reported LSPs
- RPC model for invoking PCInitiate/PCUpd requests
- Tool-generated DTOs, extensible parser
- https://wiki.opendaylight.org/view/BGP_LS_PCEP:Models

Thank you

Resources

- More information and to join:
  - wiki.opendaylight.org
- Keep informed and join the conversation
  - IRC: #opendaylight on Freenode
  - Open mailing lists: lists.opendaylight.org
  - @openDaylightSDN
  - #OpenDaylight

Backup: BGP protocol model

- Message-level model of BGP
  - RFC4271, RFC4724, RFC4760, RFC1997, RFC4360, RFC6973
  - draft-ietf-idr-ls-distribution-04
- Message is a Notification
- Model of local RIB, no route dissemination at this time
- Tool-generated DTOs, extensible parser
- Translation into draft-clemm-i2rs-yang-network-topo
- https://wiki.opendaylight.org/view/BGP_LS_PCEP:Models

Backup: BGP processing

Application
(Topology Consumer)

Controller

BGP-LS Topology Exporter

RESTCONF

MD-SAL Notification ---------- *MD-SAL Set* ---------- ----------*MD-SAL Get*

/operational

BGP-RIB

/operational

Topology

MD-SAL

MD-SAL Set ----------

BGP-LS

BGP PDU