I2RS Protocol: Requirements + Ideas

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Co-chair summary of requirements

Co-author: Protocol summary

I2RS Requirements for Protocol WG LC

WGLC in October

- draft-ietf-i2rs-ephemeral-state-00
- draft-ietf-i2rs-pub-sub-requirements/
- draft-ietf-i2rs-traceability/
- draft-ietf-i2rs-protocol-security-requirements-01

- Ephemeral State is missing minimum requirements for RESTONF/NETCONF
- My presentation provides background to help NETCONF give I2RS feedback

I2RS Requirements for Protocol WG LC

WGLC after IETF

- draft-ietf -i2rs-security-environment-reqs-01
- Ephemeral State with NETCONF/RESTCONF minimum requirements

Going to IESG with

- Architecture
- Problem statement
- I2RS RIB Information Model

Ephemeral State – 9 requirements

1. **Ephemeral state is not unique to I2RS**
2. **The ephemeral data store is a data store holds configuration that is intended to not survive a reboot.**
3. **Ephemeral state can be in any data model – so importance of ephemeral is for conformance checking**
4. **Ephemeral data store is never locked**
5. **Ephemeral data store can occur in two ways:**
   - Yang module that contains both non-ephemeral and ephemeral
   - Yang module that only contains non-ephemeral
   - The yang modules may be protocol modules (BGP) or protocol independent modules (RIB, FB-RIB, Topology)
6. **Ephemeral nodes may not have configuration nodes beneath**
7. **Ephemeral state will be denoted by "ephemeral" in Yang protocol at node level, submodule, or module level**

Ephemeral State (4)

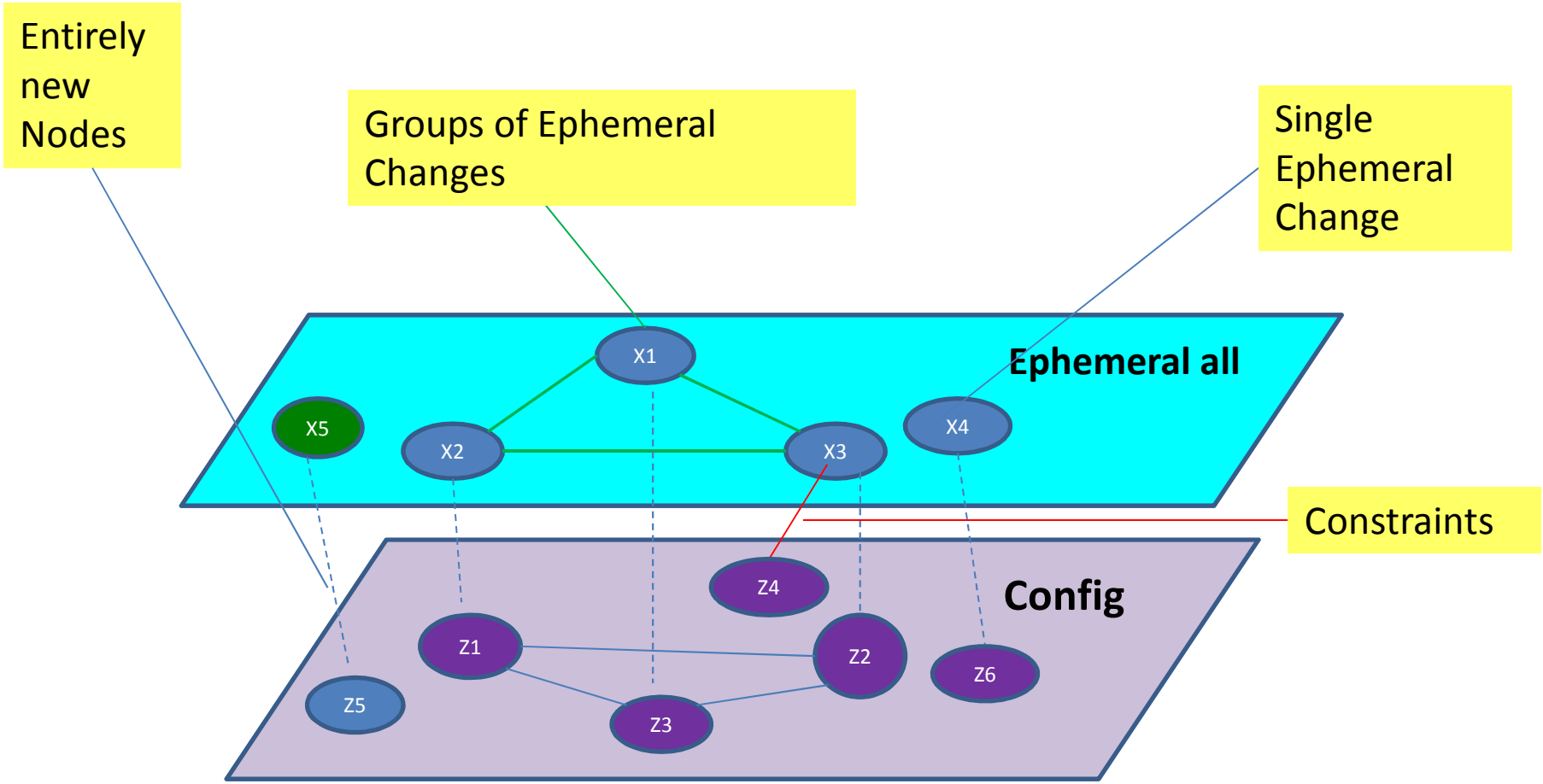
8. Caching – is out of scope for the first I2RS protocol release.
   - Long-term concern: latency of I2RS protocol
9. Ephemeral has two error handling extensions
   1. Ephemeral data store allows for reduced error handling that MAY remove the requirements for leafref checking, MUST clauses, and instance identifier (to allow more speed)
   2. Ephemeral data store allows for priority resolution of write operation
      - Priority error resolution means each I2RS client of the ephemeral I2RS agent (netconf server) **MUST BE** associated with a priority.
      - **Priority write resolution** occurs when a I2RS client with a higher priority writes a node which has been written by an I2RS client (with the lower priority).
      - When the I2RS agent (netconf server) allows a higher priority client to overwrite a lower priority client, the I2RS Agent **MAY** provide a notification indication to entities monitoring the node.

- **Agent MUST be able to send notification. Notification can be configured off.**

Or

- **Agent MUST SEND Notification**

2 Panes of Glass Model
aka (priority resolution)

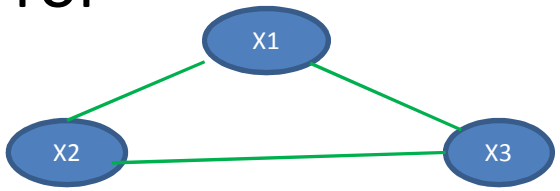


2 Panes of Glass – all or nothing

Types of error checking

- Syntax - correct syntax for node
- Referential – leafref, MUST, instance identifier
- Grouping – group of nodes that should align
  - Stop on error / Continue on error

    assume grouped nodes



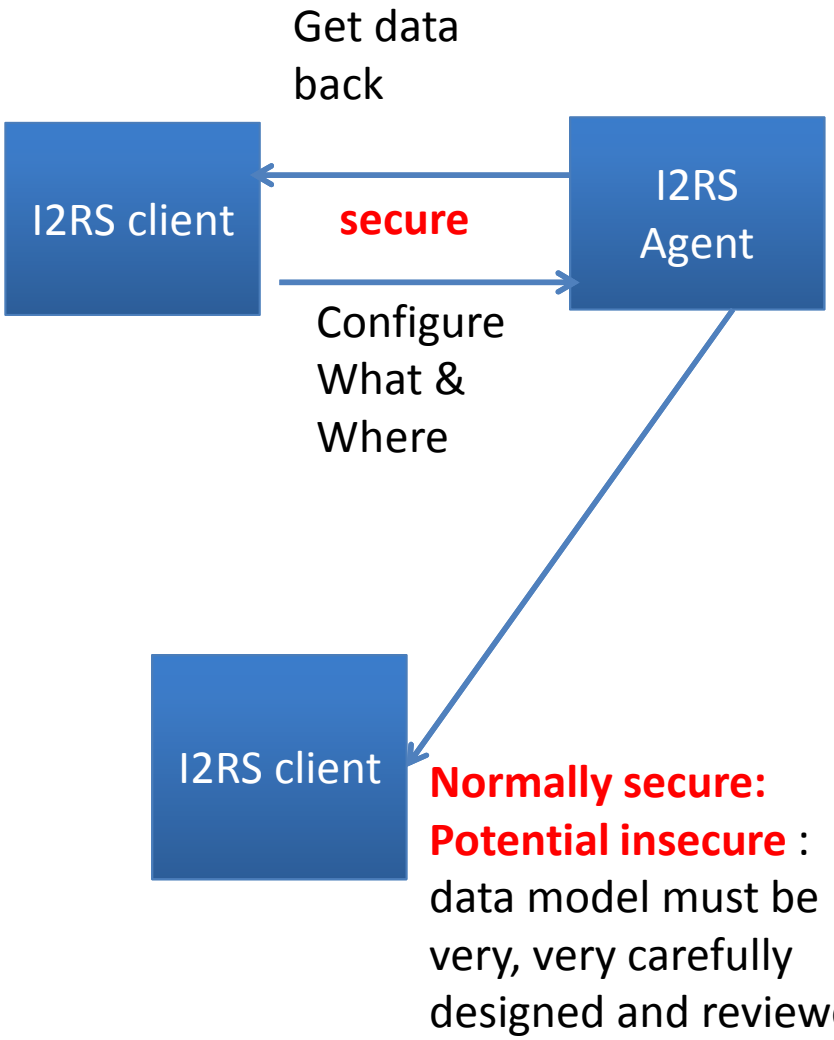
- **"All or nothing" will be mandated for first pass of I2RS protocol**

ephemeral only

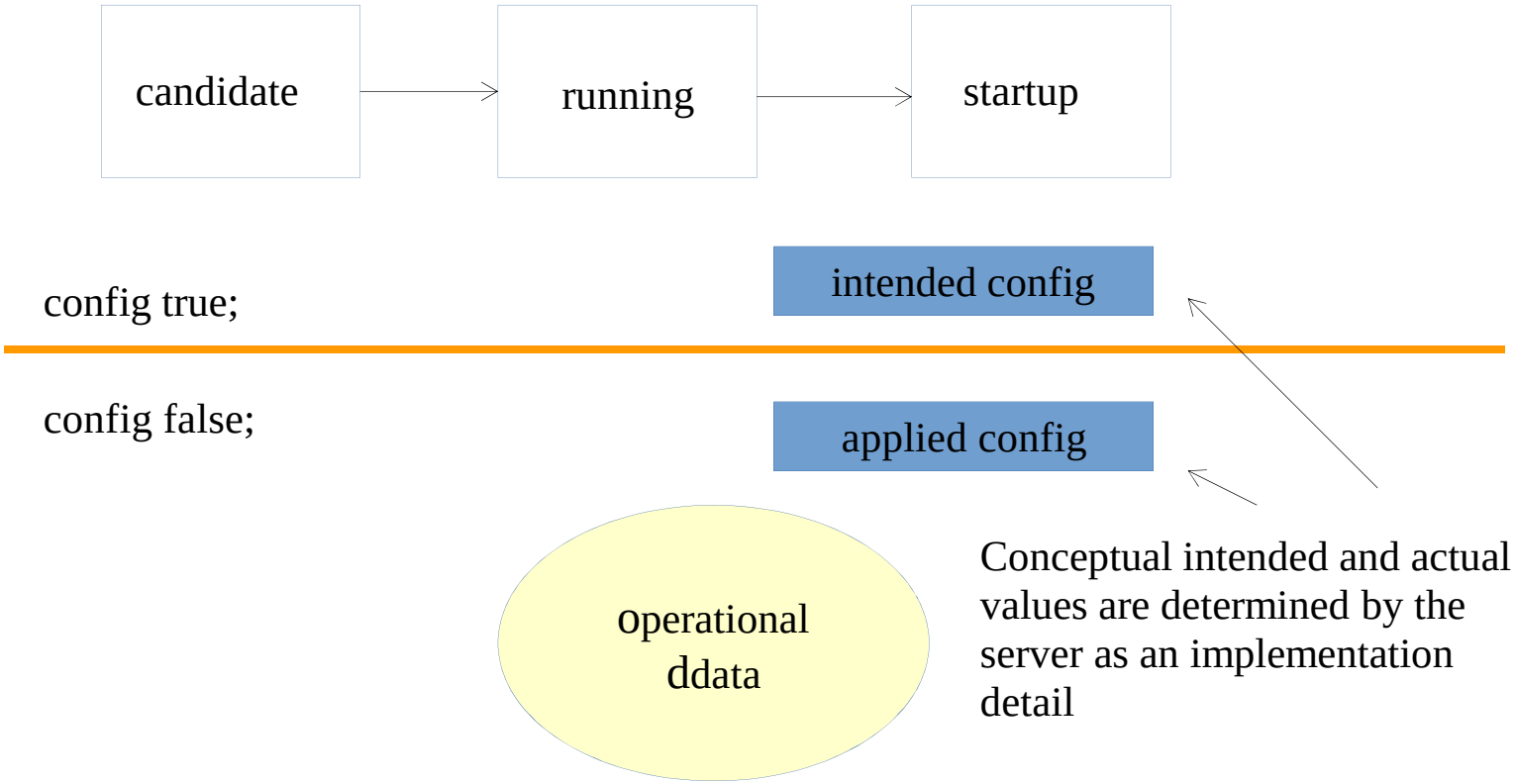
Ephemeral + config

Other Requirements

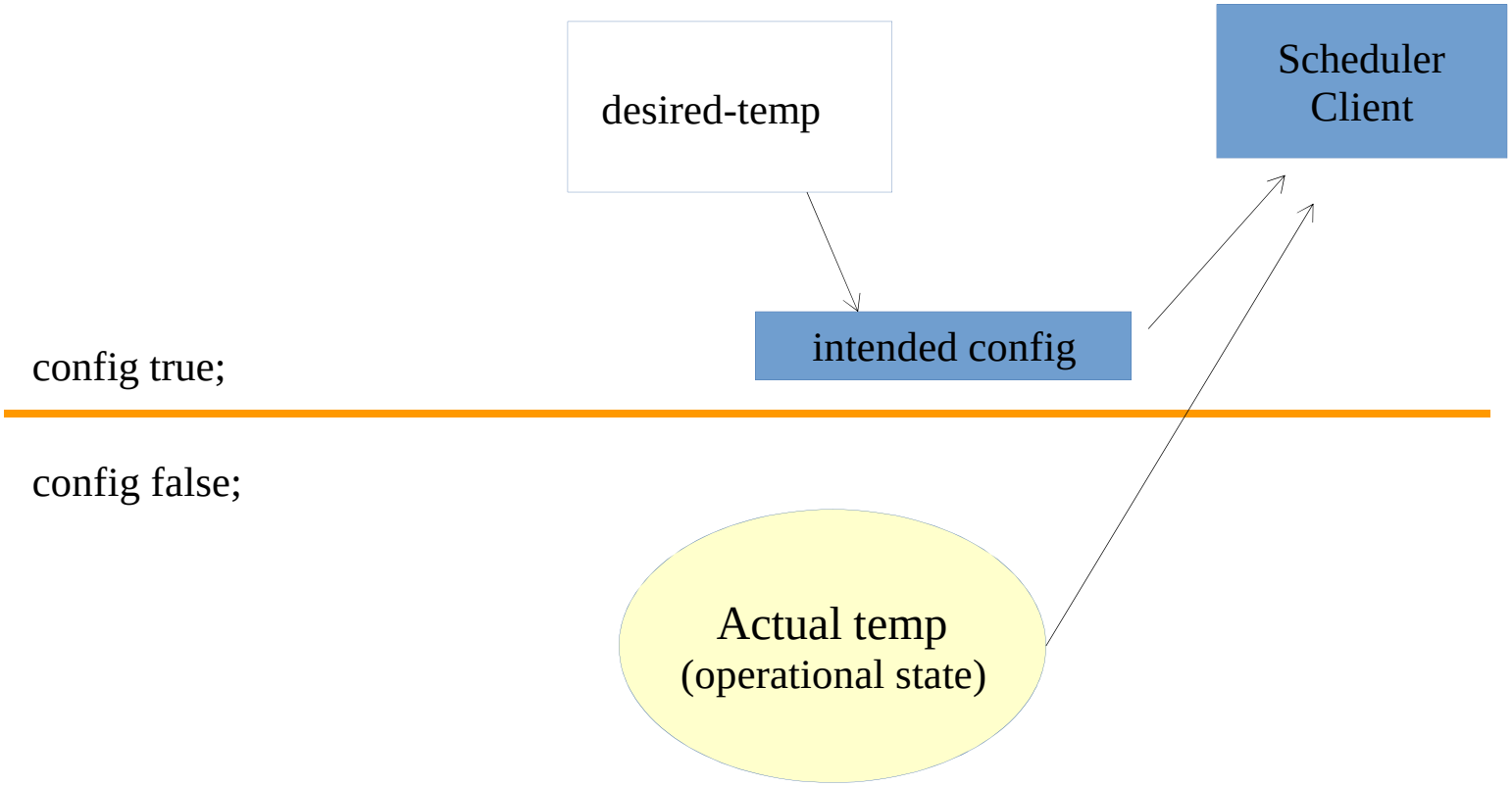
- Mutual Authentication based on client identity
  - Client identity passed outside of I2RS (AAA or other)
- Secure transport for Config + other data unless careful designed and reviewed in data model (see connection 2)
- Signaling model capabilities done with Yang library module



Protocol


candidate
running
startup
config true;
intended config
config false;
applied config
operational
ddata
Conceptual intended and actual values are determined by the server as an implementation detail

Thermostat Model

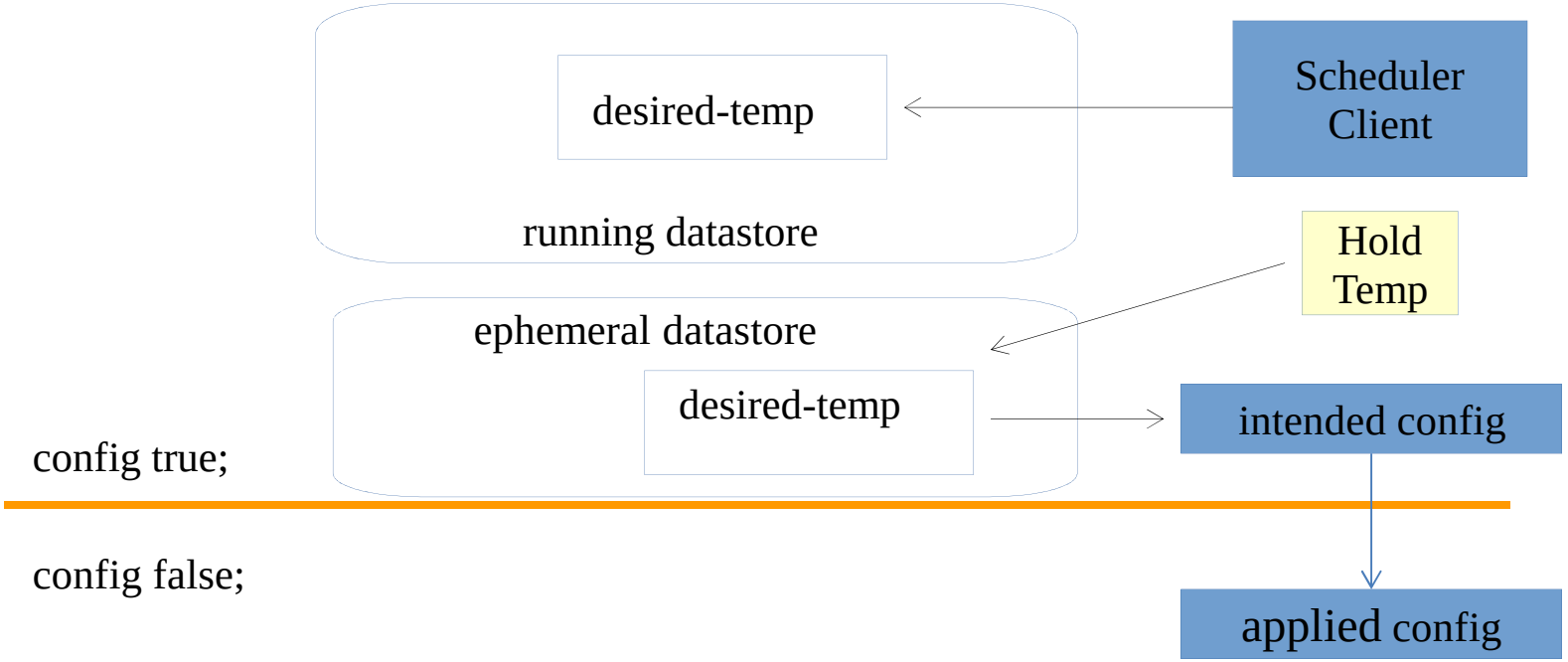


Simple Thermostat + ephemeral

```
module thermostat {
    …
    leaf desired-temp {
       type int32;
         ephemeral true;
       units “degrees Celsius”;
       description “The desired temperature”;
    }

Operational State:
    leaf actual-temp {
       type int32;
       config false;
       units “degrees Celsius”;
       description “The measured temperature”;
    }
}
```

Thermostat Model + Hold Temp



Schedule is not deleted
by hold-temp button

Desired temperature

Actual temp
(operational state)

RESTCONF Example

RESTCONF Running Datastore Edit

PUT /restconf/data/thermostat:desired-temp

{ “desired-temp”: 18 }

RESTCONF Ephemeral Datastore Edit of config=true

PUT /restconf/data/thermostat:desired-temp?datastore=ephemeral

{ “desired-temp”: 18 }