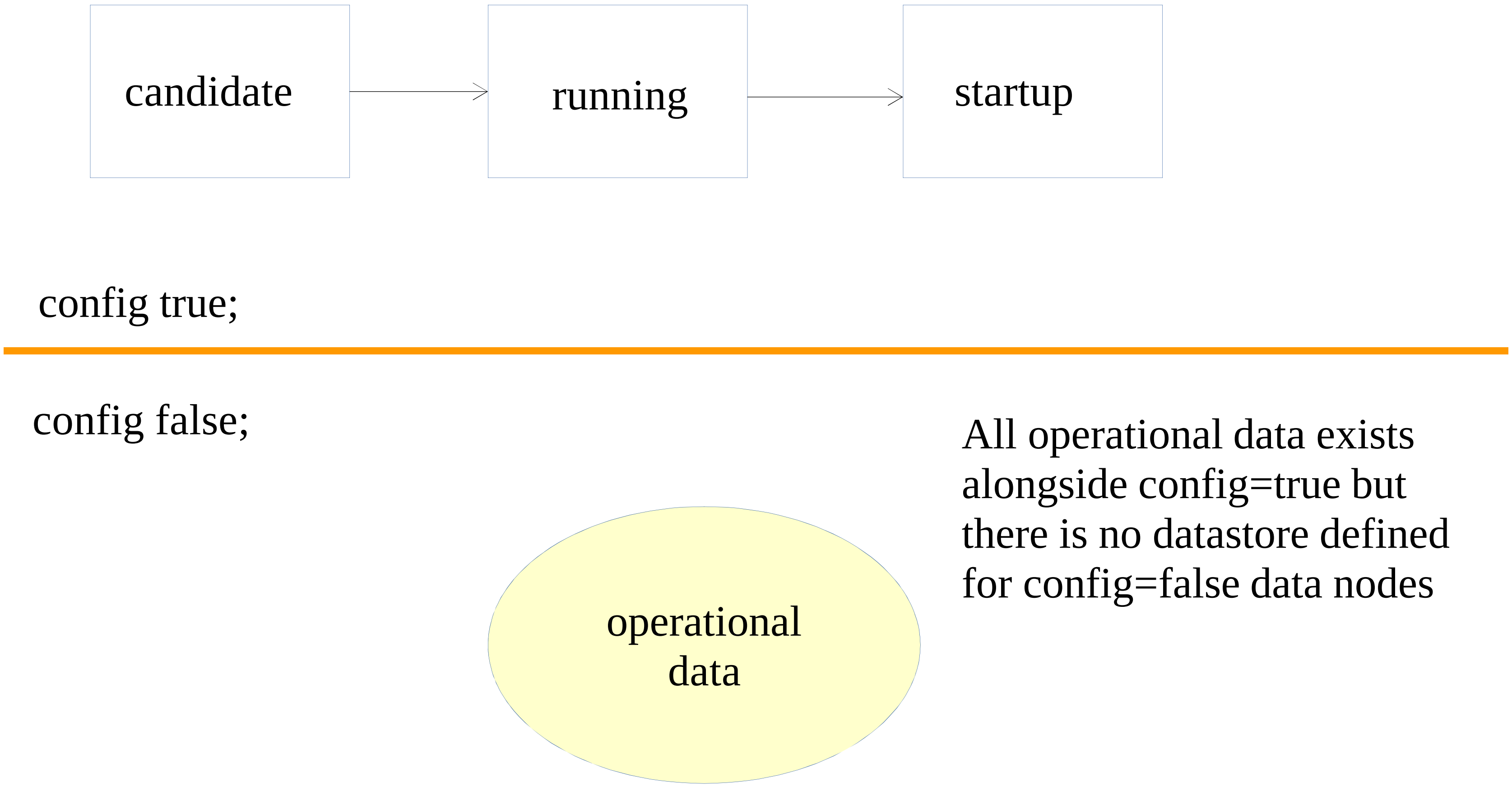
I2RS Protocol Simple Example

Hares work expansion of

Andy Bierman, Kent Watsen work

Previous Definitions



candidate

running

startup

config true;

config false;

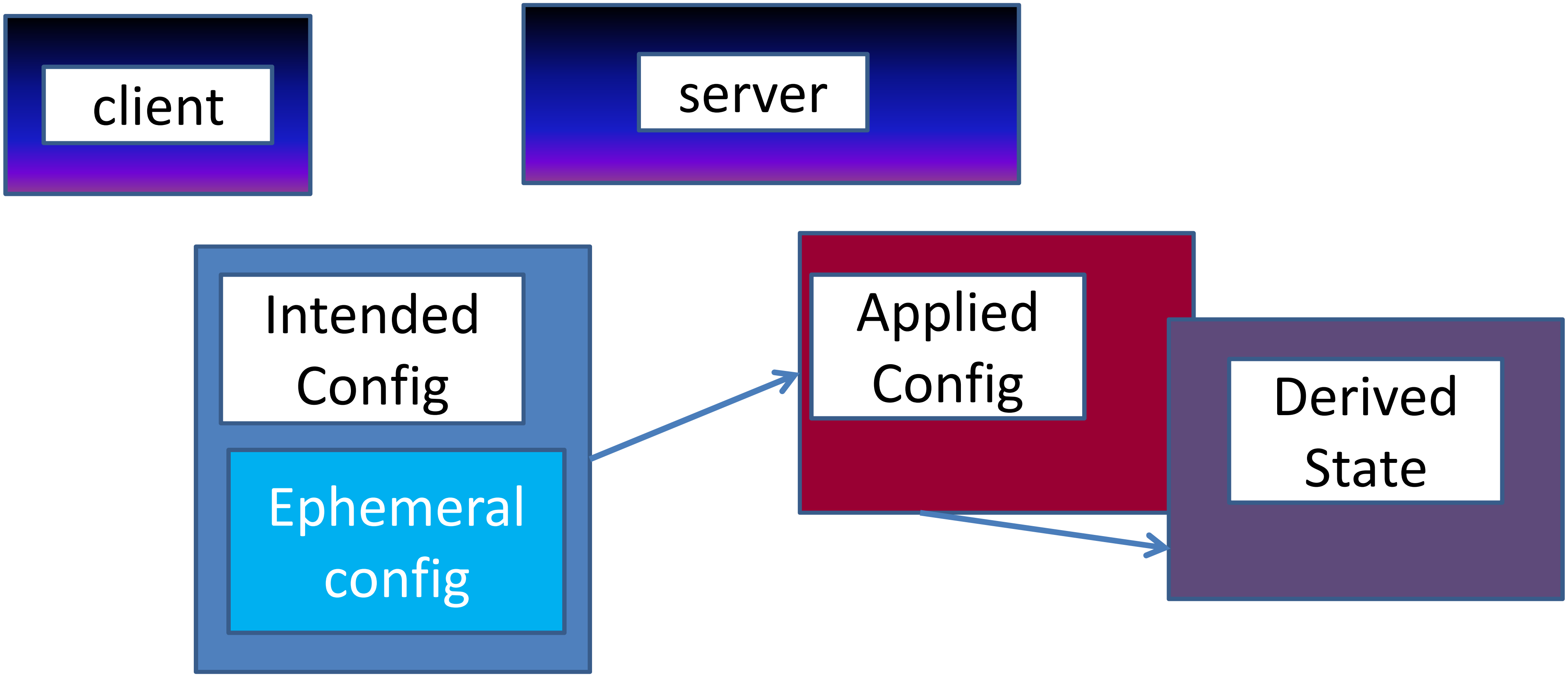
operational data

All operational data exists alongside config=true but there is no datastore defined for config=false data nodes

RFC6244

Yang meta

config	Ephemeral config
State data	Ephemeral state
notification	Ephemeral notification
operation	Ephemeral operations



client

server

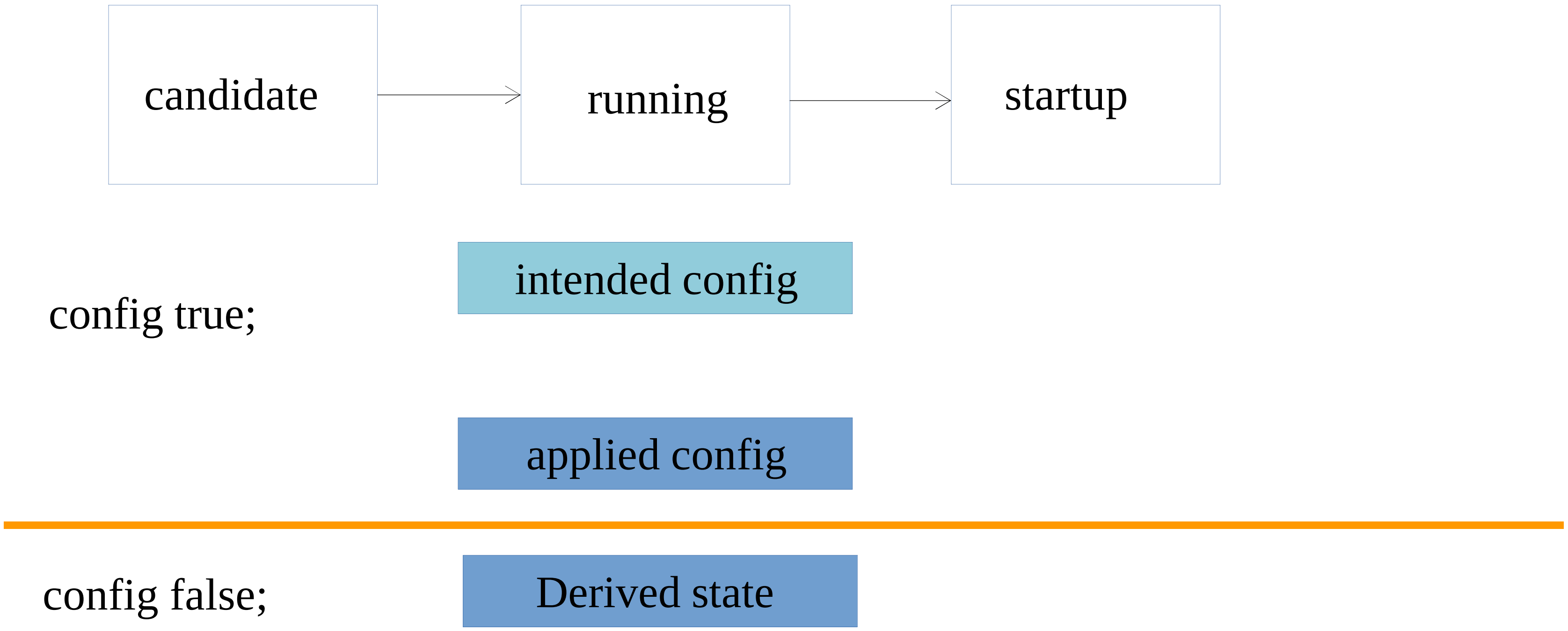
Intended Config

Ephemeral config

Applied Config

Derived State

Definitions from ietf-netmod-opstate-req



candidate

running

startup

config true;

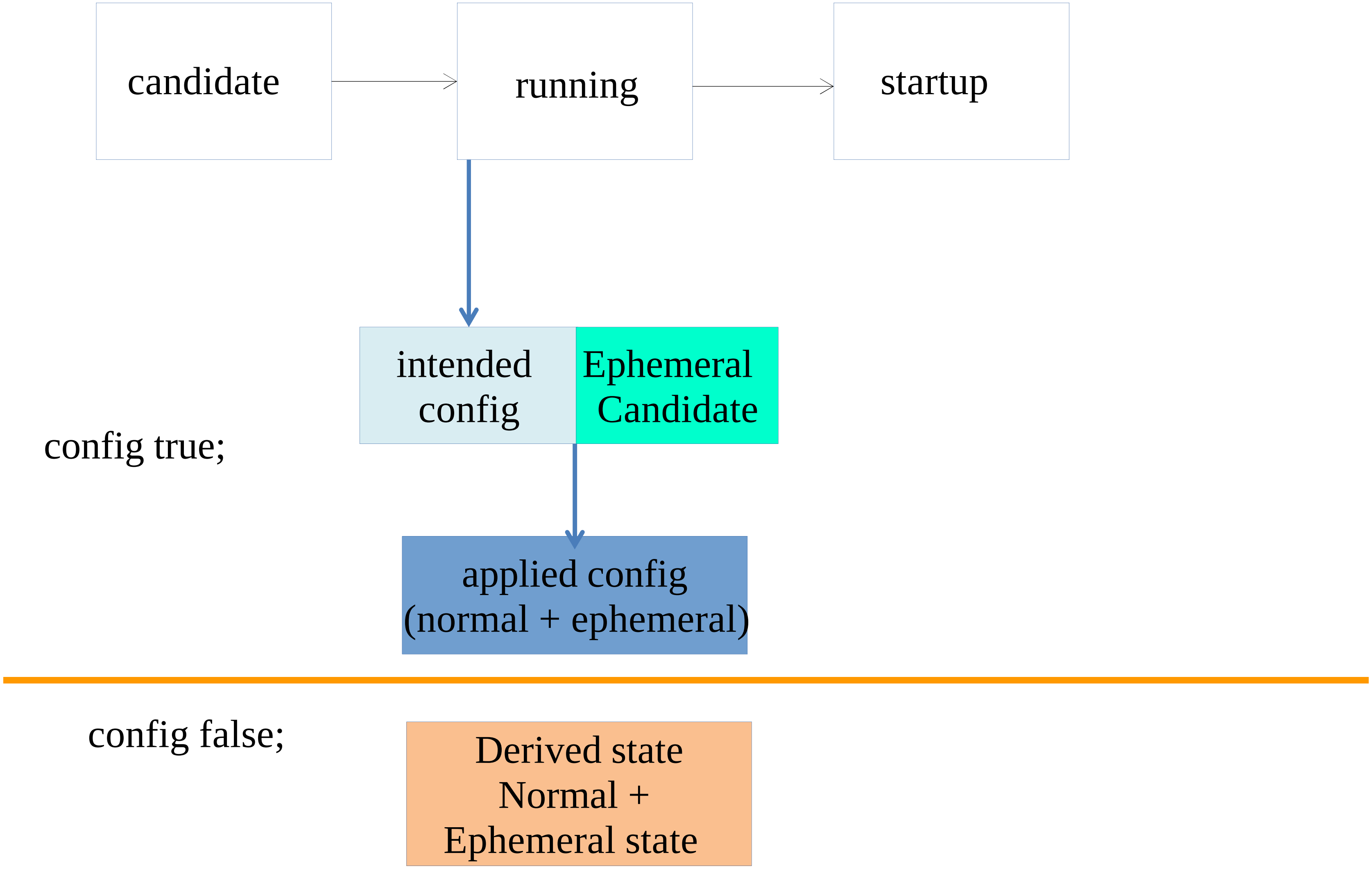
intended config

applied config

config false;

Derived state

Ephemeral Additions



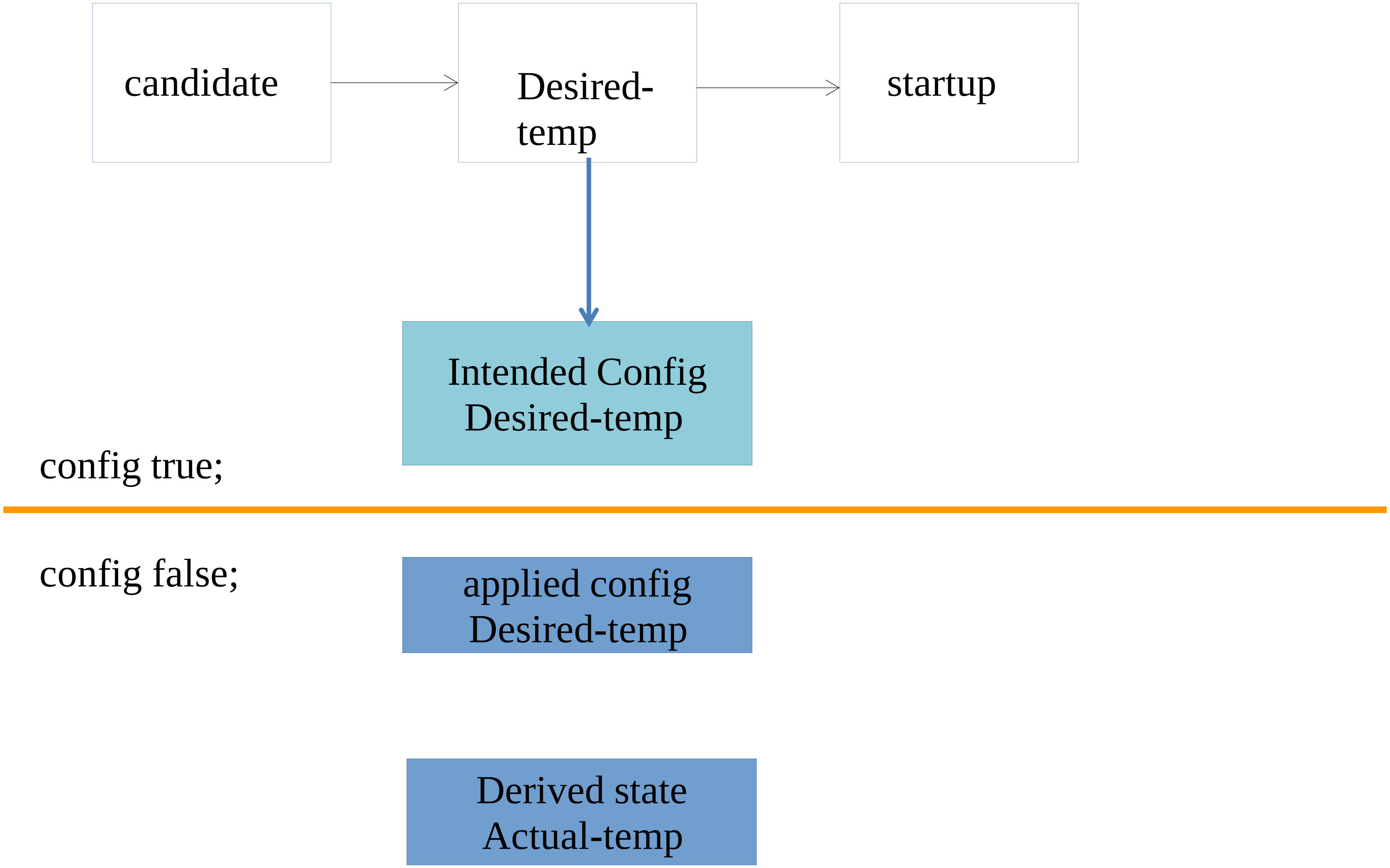
Simple Thermostat Example

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

 // operational state

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

Thermostate Model



candidate

Desired-temp

startup

Intended Config
Desired-temp

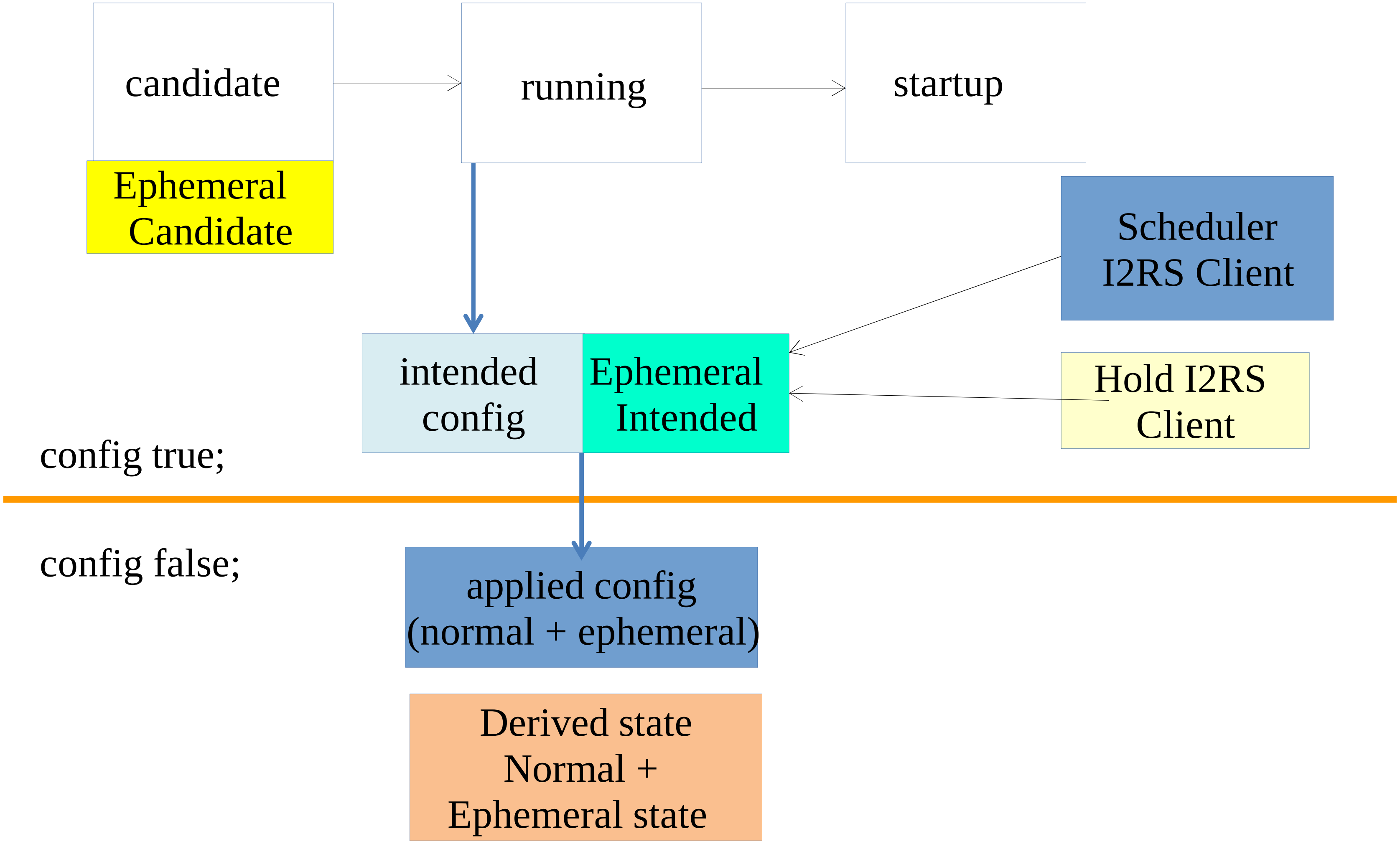
config true;

config false;

applied config
Desired-temp

Derived state
Actual-temp

Thermostat + I2RS



Simple Thermostat + ephemeral

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

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

Alternatives:

No-check

No-reference

Full-check

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?context=ephemeral

{ “desired-temp”: 18 }

NETCONF

```
<rpc-message-id=101>
  <xmlns=“urn:ietf:params:xml:ns:base:1.0”>
  <edit-config>
    <target>
      <ephemeral>
         True
         <ephemeral-validation>
            full-check
          <ephemeral-validation>
       </ephemeral>
    </target>
   <config>
      <top xmlsns=“http::/exaple.com/schema/1.0/thermostat/config>
        <desired-temp> 18 </desired-temp>
```

Capability Specification for NETCONF/RESTCONF

NETCONF (1)

- **Capability: ephemeral-datastore**
- *Overview:*
  - Not in intended to survive a reboot, and Never locked
  - Normal Case: Priority of Ephemeral Pane higher than configuration Pane. Error if two clients write same variable (priority scopes error)
  - No Rollback on ephemeral
  - Ephemeral under non-ephemeral; No non-ephemeral under Ephemeral
  - NETCONF <hello> - but no non-ephemeral under ephemeral modules, sub-trees, node
- **Dependencies:**
  - Yang: ephemeral flag, ephemeral-validation
  - Yang modules – must support notification of write conflicts (Config/ephemeral and Priority)

NETCONF (2)

- **New operations :**
  - Link-ephemeral <target-config>
  - Bulk-write – [Not sure if need or if rpc better approach]
- **Modifications**
  - <get-config> <get> - target changes
  - <edit-config> - <merge-priority> <replace-priority>
    - <default-operations>: <merge-priority> or <replace-priority>
    - <error-option> - “all-or-nothing” == “rollback-on-error
  - <unlock> <lock> - not supported
  - <confirmed commit> - not supported
  - <close-session> <kill-session> - target change
  - <Writeable-running> and <candidate> – support ephemeral (?)
  - Validate – supports ephemeral data store with three key words:

    Syntax, reduced, full-check

RESTCONF (1)

- **Capability: ephemeral-context**
- *Overview:*
  - Same as netconf except RESTCONF Context
- **Dependencies:**
  - Yang: ephemeral flag, ephemeral-validation
  - Yang modules – must support notification of write conflicts (Config/ephemeral and Priority)
  - I2RS Yang modules support: Yang patch and Yang module library

RESTCONF (20

- **Data resources**
  - +restconf/data – ephemeral data tree with edit collision features of timestamp and Entity Tag
  - Assumption: Entity can be split to client-priority
- **Modifications**
  - Options: provide indication of ephemeral state in data modules, sub-modules [ietf-netconf-yang-library]
  - HEAD – returns ephemeral or config context
  - GET - determines if ephemeral or config
  - POST/PUT/PATCH - context=ephemeral:

    uses ephemeral rules + validity + priority + no config below ephemeral
  - DELETE – ephemeral context
  - Query – Allows to filter by ephemeral
  - Error/Notifications – must interact with pub/sub push [ietf-netconf-yang-push]
  - Log and traceability -