Network Management Datastore Architecture

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NETCONF

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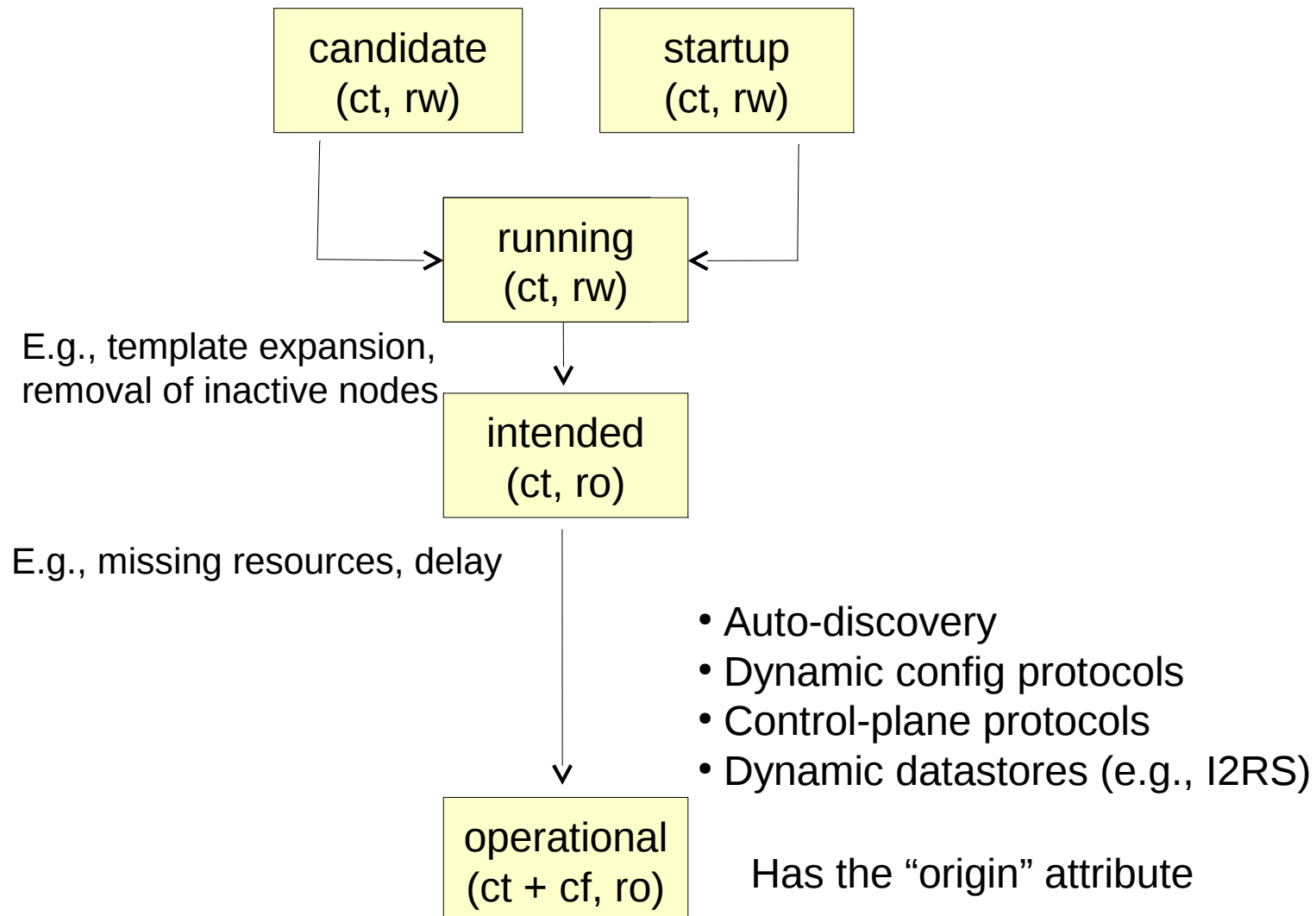
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Original Model

In the original model (RFC 6241, RFC 7950, RFC 8040) it was not possible to access the operational state separately. It was always accessed together with the running configuration.

This has lead to data model duplication ("`/foo`" and "`/foo-state`"), which requires additional logic to relate configuration to its corresponding state.

Datastore Architecture

candidate
(ct, rw)

startup
(ct, rw)

running
(ct, rw)

E.g., template expansion,
removal of inactive nodes

intended
(ct, ro)

E.g., missing resources, delay

• Auto-discovery
• Dynamic config protocols
• Control-plane protocols
• Dynamic datastores (e.g., I2RS)

operational
(ct + cf, ro)

Has the "origin" attribute

Implications on NETCONF 1(2)

Two options: define new capabilities, or incorporate into a new NETCONF version.

The changes are similar in both cases:

- Add a new capability so the server can advertise support for the new datastores.

- Add new protocol operation <get-data> that can be used to retrieve the contents of any datastore (look at Andy's <get2>)

- If NETCONF 2.0 is defined – remove <get> and possibly <get-config>.

Implications on NETCONF 2(2)

(The following items are really consequences of RFC 7952 - Defining and Using Metadata with YANG)

- Add a new filtering mechanism that can be used to filter based on meta data annotations.

- Add a new capability :with-metadata (modelled after :with-defaults), that allows a client to request the inclusion of meta data annotations in the reply to <get-data> and/or <get-config>.

Implications on RESTCONF 1(2)

Two options: define new capabilities, or incorporate into a new RESTCONF version.

The changes are similar in both cases:

- Add a new capability so the server can advertise support for the new datastores.

- Add a new path:
  `{+restconf}/datastore/<datastore-name>/data`

- for at least "running" and "operational".

- If RESTCONF 2.0 is defined – remove current combined data tree `{+restconf}/data`

Implications on RESTCONF 2(2)

(The following items are really consequences of RFC 7952 - Defining and Using Metadata with YANG)

- Add a new query parameter "metadata" that can be used to filter based on meta data annotations.

- Add a new query parameter "with-metadata" that allows a client to request the inclusion of meta data annotations in the reply.