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**RESTCONF Update to Support the NMDA
draft-ietf-netconf-nmda-restconf-01**

Abstract

This document updates RESTCONF [[RFC8040](#)] in order to support the Network Management Datastore Architecture (NMDA) defined in [[I-D.ietf-netmod-revised-datastores](#)].

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[1.](#) Introduction

This document updates RESTCONF [[RFC8040](#)] in order to support the Network Management Datastore Architecture (NMDA) defined in [[I-D.ietf-netmod-revised-datastores](#)].

The solution presented in this document is backwards compatible with [[RFC8040](#)]. This is achieved by it only adding new top-level resources, and thereby leaving the semantics of all existing resources alone.

[1.1.](#) Terminology

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

The following terms are defined in [[I-D.ietf-netmod-revised-datastores](#)] and are not redefined here:

- o operational state datastore
- o running configuration datastore
- o intended configuration datastore

2. Summary of Updates to [RFC 8040](#)

This document updates [\[RFC8040\]](#) in the following ways:

- o Adds new top-level resource `"/ds"`.
- o Adds new query parameter `"with-origin"`.
- o [Section 3.5.4](#), Paragraph 3 in [\[RFC8040\]](#) doesn't apply when interacting with any resource under `{+restconf}/ds`.
- o Updates [section 10 in \[RFC8040\]](#) by requiring servers that support NMDA to implement `"ietf-yang-library"` as defined in [\[I-D.nmdsdt-netconf-rfc7895bis\]](#).

3. Conformance

RFC Ed.: Update 201X-XX-XX below with correct date.

An NMDA-compliant RESTCONF server MUST support the operational state datastore. Such a server identifies that it supports NMDA both by implementing the `{+restconf}/ds/ietf-datastores:operational` resource, and by implementing at least revision 201X-XX-XX of the `"ietf-yang-library"` module, as specified in [\[I-D.nmdsdt-netconf-rfc7895bis\]](#).

A RESTCONF client can test if a server supports the NMDA by using either the HEAD or GET methods on `{+restconf}/ds/ietf-datastores:operational`.

4. The `{+restconf}/ds/<datastore>` Resources

This document defines a set of new resources representing datastores as defined in [\[I-D.ietf-netmod-revised-datastores\]](#). These resources are available using the resource path template:

`{+restconf}/ds/<datastore>`

Where `<datastore>` is encoded as an "identity" according to the JSON encoding rules for identities, defined in [Section 4 of \[RFC7951\]](#). Such an identity MUST be derived from the "datastore" identity in "ietf-datastores" [\[I-D.ietf-netmod-revised-datastores\]](#).

Specifically:

- o The resource `{+restconf}/ds/ietf-datastores:operational` refers to the operational state datastore.

- o The resource `{+restconf}/ds/ietf-datastores:running` refers to the running configuration datastore.
- o The resource `{+restconf}/ds/ietf-datastores:intended` refers to the intended configuration datastore.

An NMDA-compliant server MUST implement `{+restconf}/ds/ietf-datastores:operational`. Other datastore resources are optional to implement.

If a server implements the example datastore "ds-ephemeral" in the module "example-ds-ephemeral", it would implement the resource `{+restconf}/ds/example-ds-ephemeral:ds-ephemeral`.

5. Protocol Operations

All existing protocol operations defined in [\[RFC8040\]](#) for the `{+restconf}/data` resource are available for all of the new datastore resources with the following exceptions:

- o Dynamic datastores are excluded, as each dynamic datastore definition needs to be reviewed for what protocol operations it supports.
- o Some datastores are read-only by nature (e.g., `<intended>`), and hence any attempt to modify these datastores will fail.
- o The "with-defaults" query parameter ([\[RFC8040\], Section 4.8.9](#)) does not apply when interacting with `{+restconf}/ds/ietf-datastores:operational`. This means that all values are always returned from the operational state datastore, even if a node happens to have a default statement in the YANG module, and this default value is being used by the server. If the "with-defaults" query parameter is present in a request to this resource, the server MUST return a response with a "400 Bad Request" status-line. The error-tag value "invalid-value" is used in this case.
- o [\[RFC8040\], section 3.5.4](#), paragraph 3 does not apply when interacting with any resource under `{+restconf}/ds`.

5.1. The "with-origin" query parameter

The GET operation adds a new query parameter named "with-origin", which if present, requests that the server includes "origin" metadata annotations in its response, as detailed in the NMDA. This parameter is only valid when querying `{+restconf}/ds/ietf-datastores:operational` or any datastores with identities derived from the "operational" identity. Otherwise, if an invalid datastore is

specified then the server MUST return a response with a "400 Bad Request" status-line, using an error-tag value of "invalid-value". "origin" metadata annotations are not included unless a client explicitly requests them.

Data from <operational> can come from multiple sources. The server should return the most accurate value for the "origin" metadata annotation as possible, indicating the source of the operational value, as specified in [section 5.3.4](#) of the NMDA.

When encoding the origin metadata annotation for a hierarchy of returned nodes, the annotation may be omitted for a child node when the value matches that of the parent node (as described in ietf-origin@2017-08-17). [RFC Editor, please check published revision date.]

The "with-origin" query parameter is optional to support. It is identified with the URI:

```
urn:ietf:params:restconf:capability:with-origin:1.0
```

6. Security Considerations

TBD

7. IANA Considerations

This document defines one capability in the "RESTCONF Capability URNs" registry defined in [\[RFC8040\]](#):

Index	Capability Identifier

:with-origin	urn:ietf:params:restconf:capability:with-origin:1.0

8. Normative References

[I-D.ietf-netmod-revised-datastores]

Bjorklund, M., Schoenwaelder, J., Shafer, P., Watsen, K., and R. Wilton, "Network Management Datastore Architecture", [draft-ietf-netmod-revised-datastores-05](#) (work in progress), October 2017.

[I-D.nmdsdt-netconf-rfc7895bis]

Bierman, A., Bjorklund, M., and K. Watsen, "YANG Library", [draft-nmdsdt-netconf-rfc7895bis-01](#) (work in progress), July 2017.

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- [RFC7951] Lhotka, L., "JSON Encoding of Data Modeled with YANG", [RFC 7951](#), DOI 10.17487/RFC7951, August 2016, <<https://www.rfc-editor.org/info/rfc7951>>.
- [RFC8040] Bierman, A., Bjorklund, M., and K. Watsen, "RESTCONF Protocol", [RFC 8040](#), DOI 10.17487/RFC8040, January 2017, <<https://www.rfc-editor.org/info/rfc8040>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.

[Appendix A](#). Example

TBD

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