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Huawei Technologies (USA)
February 11, 2008

A Template for Internet Drafts Containing Data Models
draft-ietf-opsawg-data-model-doc-template-00

Status of This Memo

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Abstract

This memo contains two annotated templates for IETF documents that contain the definition of data models. It is intended to alleviate the work of the authors of such documents, making these more uniform and easier to read and review, thus furthering the quality of such documents and expediting their publication.

Internet-Draft

Data Model Document Text Template

February 2008

Note: Foreword to RFC Editor

Note to RFC Editor - throughout the templates in the appendices, there are numerous sample requests for action by the RFC Editor that should not be removed from the template before publication of the template. These need to retain the RFC Editor requests to match the boilerplate included in the template.

For simplicity, there are no notes to the RFC Editor in this document that should be removed, except THIS section - the complete section entitled "Note: Foreword to RFC Editor".

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1. Introduction

This memo contains two annotated templates for IETF documents that contain the definition of data models. It is intended to alleviate the work of the authors of such documents, making these more uniform and easier to read and review, thus furthering the quality of such documents and expedite their publication.

2. Overview

The templates enclosed in this document were developed to make IETF documents that contain data models more consistent. This makes it easier to review the document. There are a number of MUSTs in the document; these usually refer to IESG requirements for internet drafts, and reviewers are likely to check for these requirements.

The template contains boilerplates for IETF data model documents. Using the latest revision of this template should ensure that the latest revision of the boilerplates are used, but the most up-to-date revisions are available at <http://www.ops.ietf.org/> and <http://www.rfc-editor.org/formatting.html>.

The template contains sections that describe the purpose and organization of the data model, and the relationship between this data model and other data models. This makes it easier for reviewers to understand the data model, which speeds the IESG approval process.

The document template does not include a template for the data model itself. Tools to validate data models typically require that the data model be separated from the surrounding document. The simplest approach therefore is to develop the data model outside the document that contains the surrounding text, and then include the data model into the surrounding document written using this template.

An XML version of this template for use with xml2rfc is also available at <http://www.ops.ietf.org>.

[3.](#) Security Considerations

This memo contains a template for editing; it has no impact on network security.

[4.](#) IANA Considerations

This memo includes no request to IANA.

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Data Model Document Text Template

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[5.](#) Contributors

This template is based on contributions from the MIB Doctors, especially Bert Wijnen, Dan Romascanu, Juergen Schoenwaelder, Dave Perkins, C.M.Heard and Randy Presuhn.

[6.](#) Normative References

[RFC4181] Heard, C., "Guidelines for Authors and Reviewers of MIB Documents", [BCP 111](#), [RFC 4181](#), September 2005.

[Appendix A.](#) Change Log

Changes from [draft-harrington-text-mib-doc-template-04](#) to -00-

1. Changed all references to "MIB modules" to "data models"
2. Removed references to [RFC4181](#)
3. modified reference to mib-specific boilerplates to data-model boilerplates
4. modified sections that referred to SNMP
5. rewrote sections as an envelope for the template.

[Appendix B.](#) Open Issues

Should this template be based on

[draft-ietf-opsawg-operations-and-management.txt](#)?

Should "data models" be changed to "management data models"?

Should "data models" be changed to "management information models" in places, to reflect that there may be relationships between different types of data models, such as Netconf data models, syslog SDEs, and MIB modules?

need new Management Framework boilerplate

need Security Considerations for a Data Model document

need IANA boilerplate for non-MIB data models

[Appendix C](#). Text Template with Advice

--- start of template ---

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February 2008

Internet Engineering Task Force

Internet-Draft

Intended status: Historic

Expires: August 14, 2008

Y. Name, Ed.

Editor affiliation

February 11, 2008

Your data model document name
Your data model document name here

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Abstract

[[anchor1: This template is for authors of IETF specifications containing data models. This template can be used as a starting point to produce specifications that comply with the Operations & Management Area guidelines for data model internet drafts. Throughout the template, the marker "[TEMPLATE TODO]" is used as a placeholder to indicate an element or text that requires replacement or removal. All the places with [TEMPLATE TODO] markers should be replaced or removed before the document is submitted.]]

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Data Model Document Text Template

February 2008

This memo defines a portion of the Network Management Information Base (NMIB) for use with network management protocols. In particular it defines objects for managing [TEMPLATE TODO].

[[anchor2: [TEMPLATE TODO]: describe what functionality will be managed using this data model. It can be good to mention the protocol being managed, and whether there is a particular aspect of the protocol to be managed, or a particular goal of the model. But keep it brief. Remember, don't put any citations in the abstract, and expand your acronyms.]]

Foreword to template users

This template helps authors write the surrounding text needed in a data model internet draft, but does not provide a template for

writing the data model itself.

Throughout this template, the marker "[TEMPLATE TODO]" is used as a reminder to the template user to indicate an element or text that requires replacement or removal by the template user before submission to the internet draft editor. All [TEMPLATE TODO] markers should be resolved and removed before you submit your document to the internet-draft editor.

For updated information on data model guidelines and templates, see [RFC4181] and <http://www.ops.ietf.org/>.

For information on writing internet drafts or RFCs, see <http://www.ietf.org/ietf/lid-guidelines.txt> and RFC2223(bis), and look at <http://www.ietf.org/ID-Checklist.html> for issues to note when writing drafts.

This template is not meant to be a complete list of everything needed to write data model internet drafts, but to summarize the often-needed basic features to get a document containing a data model started. An important purpose of the template is to aid authors in developing an internet draft that is laid out in a manner consistent with other internet drafts containing data models. Internet drafts submitted for advancement to the standards track typically require review by various directorates and expert reviewers. This template standardizes the layout and naming of sections, includes the appropriate boilerplate text, and facilitates the development of tools to automate the checking of data model internet drafts, to speed the WG and IESG review processes.

An XML template is also available. For information on XML2RFC, see RFC2629 [RFC2629], <http://xml.resource.org/public/rfc/html/rfc2629.html> and "bis":

<http://xml.resource.org/authoring/draft-mrose-writing-rfcs.html>.

Also see <http://xml.resource.org/authoring/README.html> for 'rfc' option strings. The benefit of using the XML version of the template is that comments in the XML describe how to fill in each section of the template, and then XML2RFC will generate the actual internet-draft with your information. XML2RFC automatically handles much of the boilerplate, references, and idnits issues for you.

[TEMPLATE TODO] THIS section, the complete section entitled "Note: Foreword to template users" should be removed by the template user from their document before submission.

[TEMPLATE TODO] Remove all page headings from the template document, and replace them with the appropriate headings for your internet draft.

Note to RFC Editor re: [TEMPLATE TODO] markers

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This memo defines a portion of the Network Management Information Base (NMIB) for use with network management protocols. In particular it defines a data model for managing the [TEMPLATE TODO]

[[anchor4: [TEMPLATE TODO]: describe what functionality will be managed using this data model. Include citations for protocol specifications, architectures, related data models, and protocol-specific management requirements. Provide an overview of why a data model is appropriate for this protocol, whether there is a particular aspect of the protocol to be managed, and how the model is expected to be used to achieve particular goals. Highlight anything 'different' about the model. For example, a read-only data model.]]

2. The Internet-Standard Management Framework

[[anchor6: The title and text for this section has been copied from the official boilerplate, and should not be modified unless the boilerplate text at <http://ops.ietf.org> has changed. See [RFC4181 section 3.1](#) for a discussion of the boilerplate section.]]

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [section 7 of RFC 3410](#) [RFC3410].

Managed objects are accessed via a virtual information store, termed the Network Management Information Base or NMIB.

The SMIV2 MIB is a subset of the NMIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). SMIV2 is described in STD 58, [RFC 2578](#) [RFC2578], STD 58, [RFC 2579](#) [RFC2579] and STD 58, [RFC 2580](#) [RFC2580].

NMIB objects may be accessed through other protocols, such as the Network Configuration Protocol (Netconf). Objects in the NMIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a data model that is compliant to the [DISCUSS].

3. Conventions

[[anchor8: [TEMPLATE TODO] This boilerplate should be used if the [RFC2119](#) key words are used in the internet draft. The text in this section has been copied from the official boilerplate, and should not be modified.]]

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

[4.](#) Overview

[[anchor10: [TEMPLATE TODO] The narrative part should include an overview section that describes the scope and field of application of the data models defined by the specification. See [RFC4181 section 3.2](#) for a discussion of the Narrative section.]]

[5.](#) Structure of the Data Model

[[anchor12: [TEMPLATE TODO] The narrative part SHOULD include one or more sections to briefly describe the structure of the data models defined in the specification.]]

[5.1.](#) New Data Types

[[anchor14: [TEMPLATE TODO] describe any data types defined in the data model, and their purpose. It may be helpful to highlight any textual conventions data types imported from partner documents. Generic and Common Data Types can be found summarized at <http://www.ops.ietf.org/common-datatypes.html>. [DISCUSS: need to create the appropriate web pages for ops.ietf.org.] If there are no new data types defined in your data model, this section should say so.]]

[5.2.](#) The [TEMPLATE TODO] Subtree

[[anchor16: [TEMPLATE TODO] copy this section for each subtree in the data model, and describe the purpose of the subtree. For example, "The fooStats subtree provides information for identifying fault conditions and performance degradation of the foo functionality."]]

[5.3.](#) The Notifications Subtree

[[anchor18: [TEMPLATE TODO] describe the notifications defined in the data model, and their purpose. Include a discussion of congestion control. You might want to discuss throttling as well. See [RFC2914](#). If there are no notifications defined in your data model, this section should say so.]]

[5.4.](#) The Table Structures

[[anchor20: [TEMPLATE TODO] Describe the tables in the data model,

their purpose, and their relationship to each other. Has the data model been normalized? e.g., If the row in one table is related to a

row in another table, what happens when one of the rows is deleted? Should the related row be deleted as well? If a row is added to one table, does this have implications for the other tables? Consider both directions.]]

6. Relationship to Other Data Models

[[anchor22: [TEMPLATE TODO]: The narrative part should include a section that specifies the relationship (if any) of the data models contained in this internet draft to other standards, particularly to standards containing other data models. If the data models defined by the specification import definitions from other data models or are always implemented in conjunction with other data models, then those facts should be noted in the narrative section, as should any special interpretations of objects in other data models. Note that citations may NOT be put into the data model portions of the internet draft, but documents used for Imported items are Normative References, so the citations should exist in the narrative section of the internet draft. The preferred way to fill in a REFERENCE clause within a data model is of the form: "Guidelines for Writing an IANA Considerations Section in RFCs", [RFC2434, section 2.3.](#)]]

6.1. Relationship to the [TEMPLATE TODO] Data Model

[[anchor24: Example: The Interface data model [[RFC2863](#)] requires that any data model which is an adjunct of the Interface data model clarify specific areas within the Interface data model. These areas were intentionally left vague in the Interface data model to avoid over-constraining the data model, thereby precluding management of certain media-types. [Section 4 of \[RFC2863\]](#) enumerates several areas which a media-specific data model must clarify. The implementor is referred to [[RFC2863](#)] in order to understand the general intent of these areas.]]

6.2. Data Models required for IMPORTS

[[anchor26: [TEMPLATE TODO]: Citations are not permitted within a data model, but any model mentioned in an IMPORTS clause or document mentioned in a REFERENCE clause is a Normative reference, and must be

cited someplace within the narrative sections. If there are imported items in the data model, such as data types, that are not already cited, they can be cited in text here. Since relationships to other data models should be described in the narrative text, this section is typically used to cite models from which data types are imported. Example: "The following data model IMPORTS objects from SNMPv2-SMI [RFC2578], SNMPv2-TC [RFC2579], SNMPv2-CONF [RFC2580], and IF-MIB [RFC2863]."]]

7. Definitions

[[anchor28: This section contains the actual data model(s). These data models MUST conform to the guidelines for data modeling language usage and naming conventions, as described in RFC XXXX.]]

[TEMPLATE TODO]: put your valid data model here.
A list of tools that can help automate the process of validating data model definitions can be found at <http://tools.ietf.org>

8. Security Considerations

[[anchor30: [TEMPLATE TODO] Each internet draft that defines one or more data models MUST contain a section that discusses security considerations relevant to those models. This section MUST be patterned after the latest approved template (available at <http://www.ops.ietf.org/data-model-security.html>).]]

[[anchor31: [TEMPLATE TODO] if your data model permits modifying objects at runtime, including creating or deleting instances, please include the following boilerplate paragraph, and list the objects and their sensitivity.]]

There are a number of management objects defined in this data model which can be modified and/or created and/or deleted at runtime. Such objects may be considered sensitive or vulnerable in some network environments. The support for such operations in a non-secure environment without proper protection can have a negative effect on network operations. These are the structures and objects and their sensitivity/vulnerability:

o

[[anchor32: [TEMPLATE TODO] else if there are no modifiable objects in your data model, use the following boilerplate paragraph.]]

There are no management objects defined in this data model that can be created, deleted, or modified at runtime. If this data model is implemented correctly, there is no risk that an intruder can alter or create any management objects of this data model.

[[anchor33: For all data models you must evaluate whether any readable objects are sensitive or vulnerable (for instance, if they might reveal customer information or violate personal privacy laws such as those of the European Union if exposed to unauthorized parties). If so, please include the following boilerplate paragraph.]]

Some of the readable objects in this data model may be considered sensitive or vulnerable in some network environments. It is important to control access to these data objects and possibly to encrypt the values of these objects when sending them over the network. These are the structures and objects and their sensitivity/vulnerability:

o

- o [[anchor34: [TEMPLATE TODO] you should explicitly list by name any readable objects that are sensitive or vulnerable and the associated security risks should be spelled out.]]

[[anchor35: [TEMPLATE TODO] The following three boilerplate paragraphs should not be changed without very good reason. Changes will almost certainly require justification during IESG review.]]

Versions of management protocols might not include adequate security. Even if the network itself is secure (for example by using IPsec), there is no control as to who on the secure network is allowed to create, modify, or read the objects in this data model.

It is RECOMMENDED that implementers support security features including cryptographic mechanisms for authentication, integrity checking, confidentiality, and data access controls.

It is RECOMMENDED that operators deploy management protocols with security features including authentication, integrity checking, confidentiality, and data access controls. and to enable the security features. It is then a customer/operator responsibility to ensure that the entity giving access to an instance of this data model is properly configured to give access only to those principals (users) that have legitimate rights to create, modify, delete, or read the objects in this data model.

9. IANA Considerations

[[anchor37: [TEMPLATE TODO] In order to comply with IESG policy as set forth in <http://www.ietf.org/ID-Checklist.html>, every Internet-Draft that is submitted to the IESG for publication MUST contain an IANA Considerations section. The requirements for this section vary depending what actions are required of the IANA. See "Guidelines for Writing an IANA Considerations Section in RFCs" [[RFC2434](#)]. and see [RFC4181 section 3.5](#) for more information on writing an IANA clause for a data model internet draft.]]

Option #1:

The data model in this document uses the following IANA assignment recorded in the [TEMPLATE TODO] registry:

Option #2:

Editor's Note (to be removed prior to publication): the IANA is requested to assign a value for "XXX" and to record the assignment in the [TEMPLATE TODO] registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the data model) with the assigned value and to remove this note.

Note well: prior to official assignment by the IANA, an internet draft MUST use placeholders (such as "XXX" above) rather than actual names or numbers.

Option #3:

This memo includes no request to IANA.

[10.](#) Contributors

[11.](#) References

[11.1.](#) Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIV2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIV2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIV2", STD 58, [RFC 2580](#), April 1999.

[11.2.](#) Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.
- [RFC2629] Rose, M., "Writing I-Ds and RFCs using XML", [RFC 2629](#),

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June 1999.

- [RFC4181] Heard, C., "Guidelines for Authors and Reviewers of MIB Documents", [BCP 111](#), [RFC 4181](#), September 2005.

[Appendix A.](#) Change Log

This optional section should be removed before the internet draft is submitted to the IESG for publication as an RFC.

[Appendix B.](#) Open Issues

[[anchor43: [TEMPLATE TODO] This list of issues listed in this optional section should be cleared and removed, and this optional section should be removed before the internet draft is submitted to the IESG for publication as an RFC.]]

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Editor affiliation
Editor affiliation address
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Phone: Editor address
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Acknowledgement

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---- end of template ---

[Appendix D](#). Text Template without Advice

--- start of template ---

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1. Introduction

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2. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [section 7 of RFC 3410](#) [RFC3410].

Managed objects are accessed via a virtual information store, termed the Network Management Information Base or NMIB.

The SMIV2 MIB is a subset of the NMIB. MIB objects are generally accessed through the Simple Network Management Protocol (SNMP). Objects in the MIB are defined using the mechanisms defined in the Structure of Management Information (SMI). SMIV2 is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].

NMIB objects may be accessed through other protocols, such as the Network Configuration Protocol (Netconf). Objects in the NMIB are defined using the mechanisms defined in the Structure of Management Information (SMI). This memo specifies a data model that is compliant to the [DISCUSS].

[3.](#) Conventions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [RFC 2119](#) [[RFC2119](#)].

[4.](#) Overview

[5.](#) Structure of the Data Model

[5.1.](#) New Data Types

[5.2.](#) The [TEMPLATE TODO] Subtree

[5.3.](#) The Notifications Subtree

[5.4.](#) The Table Structures

[6.](#) Relationship to Other Data Models

[6.1.](#) Relationship to the [TEMPLATE TODO] Data Model

[6.2.](#) Data Models required for IMPORTS

[7.](#) Definitions

[TEMPLATE TODO]: put your valid data model here.
A list of tools that can help automate the process of validating data model definitions can be found at <http://tools.ietf.org>

8. Security Considerations

There are a number of management objects defined in this data model which can be modified and/or created and/or deleted at runtime. Such objects may be considered sensitive or vulnerable in some network environments. The support for such operations in a non-secure environment without proper protection can have a negative effect on network operations. These are the structures and objects and their sensitivity/vulnerability:

- o

There are no management objects defined in this data model that can be created, deleted, or modified at runtime. If this data model is implemented correctly, there is no risk that an intruder can alter or create any management objects of this data model.

Some of the readable objects in this data model may be considered sensitive or vulnerable in some network environments. It is important to control access to these data objects and possibly to encrypt the values of these objects when sending them over the network. These are the structures and objects and their sensitivity/vulnerability:

- o

- o

Versions of management protocols might not include adequate security. Even if the network itself is secure (for example by using IPsec), there is no control as to who on the secure network is allowed to create, modify, or read the objects in this data model.

It is RECOMMENDED that implementers support security features including cryptographic mechanisms for authentication, integrity checking, confidentiality, and data access controls.

It is RECOMMENDED that operators deploy management protocols with security features including authentication, integrity checking, confidentiality, and data access controls. and to enable the security features. It is then a customer/operator responsibility to ensure that the entity giving access to an instance of this data model is properly configured to give access only to those principals (users) that have legitimate rights to create, modify, delete, or read the objects in this data model.

[9.](#) IANA Considerations

Option #1:

The data model in this document uses the following IANA assignment recorded in the [TEMPLATE TODO] registry:

Option #2:

Editor's Note (to be removed prior to publication): the IANA is requested to assign a value for "XXX" and to record the assignment in the [TEMPLATE TODO] registry. When the assignment has been made, the RFC Editor is asked to replace "XXX" (here and in the data model) with the assigned value and to remove this note.

Note well: prior to official assignment by the IANA, an internet draft MUST use placeholders (such as "XXX" above) rather than actual

names or numbers.

Option #3:

This memo includes no request to IANA.

[10.](#) Contributors

[11.](#) References

[11.1.](#) Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIv2)", STD 58, [RFC 2578](#), April 1999.
- [RFC2579] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Textual Conventions for SMIv2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., and J. Schoenwaelder, "Conformance Statements for SMIv2", STD 58, [RFC 2580](#), April 1999.

[11.2](#). Informative References

- [RFC3410] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction and Applicability Statements for Internet-Standard Management Framework", [RFC 3410](#), December 2002.
- [RFC2629] Rose, M., "Writing I-Ds and RFCs using XML", [RFC 2629](#), June 1999.
- [RFC4181] Heard, C., "Guidelines for Authors and Reviewers of MIB Documents", [BCP 111](#), [RFC 4181](#), September 2005.

[Appendix A](#). Change Log

This optional section should be removed before the internet draft is submitted to the IESG for publication as an RFC.

[Appendix B](#). Open Issues

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Expires August 14, 2008

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