Operations & Management Area   Bob Moore
INTERNET-DRAFT   IBM
Category: Standards Track   Kwok Ho Chan
                                                        Nortel Networks
                                                            March, 2001

            SNMP Textual Convention for Reusable Conceptual Rows

                    <draft-ietf-ops-rowpointer-tc-01.txt>
                       Friday, March 02, 2001, 1:20 PM

Status of this Memo

Copyright Notice

Abstract

  This document defines a textual convention, ReusableRow, similar to
  the RowStatus and StorageType textual conventions defined in RFC 2579
  [7]. Like these two textual conventions, ReusableRow characterizes
  the conceptual row of which it is a part. It indicates whether, in
  the course of a cloning activity, the row should be duplicated (with,
  obviously, a different index value), or simply pointed to by one or
  more newly cloned objects. This cloning may involve the scripting-
  based techniques defined under the SNMP Configuration umbrella, but it
  need not: cloning can also be realized with ordinary SNMP Get and Set
  operations.

Table of Contents

1. Introduction

This document defines a textual convention, ReusableRow, similar to
the RowStatus and StorageType textual conventions defined in RFC 2579
[7]. Like these two textual conventions, ReusableRow characterizes
the conceptual row of which it is a part. It indicates whether, in
the course of a cloning activity, the row should be duplicated (with,
obviously, a different index value), or simply pointed to by one or
more newly cloned objects. This cloning may involve the scripting-
based techniques defined under the SNMP Configuration umbrella, but it
need not: cloning can also be realized with ordinary SNMP Get and Set
operations.

The process of creating instance-specific configuration from an
implementation-specific template is discussed in [18]. (EDITOR'S
NOTE: Since this textual convention can also be used with "ordinary"
SNMP Get and Set operations, I think we can treat this reference as
non-normative for the purposes of advancing the textual convention to
Proposed Standard.) Briefly, a template involves rows in several
tables, tied together with RowPointer objects. To clone one of these
RowPointers, the process doing the cloning needs to examine the
conceptual row that it is pointing to. If the row being pointed to
contains an object with the syntax ReusableRow, this object will tell
the cloning process how to do the cloning:

    o   If the value of the ReusableRow object is 'reusable(2)', then
        the new RowPointer is set to point to the existing conceptual
        row.
    o   If the value of the ReusableRow object is 'singleUse(3)', then
        the cloning process creates a copy of the entire conceptual
        row, and sets the RowPointer to point to this new row. This is
        also the default behavior, which a cloning process would
        exhibit if the conceptual row being pointed to did not contain
        a ReusableRow object.

Note that the "cloning process" described here need not be an SNMP
Configuration script. A different type of cloning can also benefit
from this textual convention. Using only SNMP Get and Set operations,

it is possible to retrieve one instance-specific conceptual row, and
then use the values that were retrieved to create another instance-
specific row "just like it." This textual convention tells the
process doing the cloning whether a pointer in a newly created
conceptual row may point to the same conceptual row pointed to by the
object from which the pointer was cloned.

A table may include a columnar object of type ReusableRow only if it
makes sense for the rows of the table to be reused. For example, a
table containing operational data such as state variables, counters,
and gauges would not have a ReusableRow object in it, because separate
rows will always be needed for separate resources. Configuration
data, on the other hand, is a good candidate for reuse, since it is
easier to change if it exists in only one place.

Because it appears in each conceptual row of a table, rather than
being a scalar object characterizing the table as a whole, it is
possible for an object having the syntax ReusableRow to have different
values in different rows. Such an object represents a capability of
the managed system. So one would expect it to have the same value is
every row of a given table, unless the table itself covers different
implementation elements in the managed system.

A ReusableRow object represents a capability of the managed system,
rather than something that is configurable. Thus it SHOULD have MAX-
ACCESS of 'read-only'. While the definition allows the managed system
itself to change the value of a ReusableRow object, the implications
of a managed system's doing this need further study. For now, it is
assumed that the value of a particular instance of a ReusableRow
object does not change.

In order for a cloning process to make use of a ReusableRow object, it
must have knowledge of the MIB that defines the information it is
cloning. Otherwise it will be unaware that the ReusableRow object
even exists.

For definers of new MIBs, the process for using this textual
convention is straightforward: simply include an object of type
ReusableRow in those tables for which reusability makes sense. It
should also be possible to retrofit the textual convention into
previously defined MIBs, by augmenting the appropriate tables. If a
cloning process has knowledge of the module containing the
augmentation(s), then it can make use of the ReusableRow objects there
just as it would in the case of a completely new MIB module.

2. Definitions

SNMP-REUSABLE-ROW-TC-MIB DEFINITIONS ::= BEGIN

IMPORTS

```
      MODULE-IDENTITY, mib-2 FROM SNMPv2-SMI
      TEXTUAL-CONVENTION      FROM SNMPv2-TC;

   snmpReusableRowTCMIB MODULE-IDENTITY
     LAST-UPDATED "200103020000Z" -- March 2, 2001
     ORGANIZATION
         "IETF Operations & Management Area"
     CONTACT-INFO
         "Bob Moore
          IBM Corporation, BRQA/502
          PO Box 12195
          Research Triangle Park, NC 27709, USA
          Phone: +1 919 254 4436
          EMail: remoore@us.ibm.com

          Kwok Ho Chan
          Nortel Networks
          600 Technology Park Drive
          Billerica, MA 01821, USA
          E-mail: khchan@nortelnetworks.com

          Send comments to mibs@ops.ietf.org."

   DESCRIPTION
     "This MIB module defines a textual convention that indicates
      whether a conceptual row is reusable."

   REVISION     "200103020000Z" -- March 2, 2001
   DESCRIPTION
       "Initial version, published as RFCnnnn."
   ::= { mib-2 67890 } -- to be assigned by IANA


 ReusableRow ::= TEXTUAL-CONVENTION
    STATUS       current
    DESCRIPTION
            "This textual convention characerizes a
            conceptual row as reusable or not reusable
            for the purposes of cloning a configuration
            template.  The objects being cloned may
            either be special ones that express
            configuration information at the
            mechanism-specific level, or simply
            instance-specific ones that already exist at
            the time the cloning is done.

            The following values are defined:
               - other(1)
               - reusable(2): the conceptual row is
```

available to be pointed to by mulitple
                    RowPointer objects.
                - singleUse(3): a separate copy of the

```
                    conceptual row is needed for each
                    RowPointer object that points to it.

                Because it represents a capability of the
                managed sytsem, rather than something that
                is configurable, an object having this syntax
                SHOULD have MAX-ACCESS of 'read-only'."

        SYNTAX   INTEGER {
                   other(1),
                   reusable(2),
                   singleUse(3)
                 }

  END
```

[3](#). **Previous Approach**

The original version of this document included the following module,
which defined a Textual Convention for characterizing the objects
pointing to a reusable conceptual row. It is retained here for the
moment for comparison with the current approach.

```
SNMP-ROWPOINTER-TC-MIB DEFINITIONS ::= BEGIN


   IMPORTS
     MODULE-IDENTITY, mib-2 FROM SNMPv2-SMI
     TEXTUAL-CONVENTION     FROM SNMPv2-TC;


   snmpRowPointerTCMIB MODULE-IDENTITY
     LAST-UPDATED "200012180000Z" -- December 18, 2000
     ORGANIZATION
         "SNMP Configuration WG"
     CONTACT-INFO
         "Bob Moore
          IBM Corporation, BRQA/502
          PO Box 12195
          Research Triangle Park, NC 27709, USA
          Phone: +1 919 254 4436
          EMail: remoore@us.ibm.com

          Kwok Ho Chan
          Nortel Networks
          600 Technology Park Drive
          Billerica, MA 01821, USA
          E-mail: khchan@nortelnetworks.com
```

Send comments to snmpconf@ops.ietf.org."

       DESCRIPTION

         "This MIB module defines textual conventions similar to the
        RowPointer textual convention, with additional sementics."

     REVISION   "200012180000Z" -- December 18, 2000
     DESCRIPTION
         "Initial version, published as RFCnnnn."
     ::= { mib-2 67890 } -- to be assigned by IANA

  StaticRowPointer ::= TEXTUAL-CONVENTION
      STATUS   current
      DESCRIPTION
              "Like a RowPointer, this textual convention
              represents a pointer to a conceptual row.
              The value is the name of the instance of the
              first accessible columnar object in the
              conceptual row.

              The additional semantics of this textual
              convention, relative to RowPointer, are
              related to the creation of instance-specific
              objects by cloning. The objects being cloned
              may either be special ones that express
              configuration information at the
              mechanism-specific level, or simply
              instance-specific ones that already exist at
              the time the cloning is done. When an object
              with the syntax StaticRowPointer is cloned, the
              StaticRowPointer in the newly cloned object is
              set to point to the same conceptual row that the
              StaticRowPointer in the cloned-from object
              pointed to. The cloning operations may be
              accomplished either with the script-based
              technique defined by SNMP Configuration, or by
              ordinary SNMP Get and Set operations.

              When cloning is not involved, this textual
              convention behaves identically to the RowPointer
              textual convention. Specifically, once an object
              with this syntax has been created, either by
              cloning or by other means, its value may be
              updated in the same way that the value of any
              other object with read-write or read-create
              access may be updated."
      SYNTAX   OBJECT IDENTIFIER

   END

4. Intellectual Property

   The IETF takes no position regarding the validity or scope of any
   intellectual property or other rights that might be claimed to pertain

to the implementation or use of the technology described in this
document or the extent to which any license under such rights might or
might not be available; neither does it represent that it has made any
effort to identify any such rights. Information on the IETF's
procedures with respect to rights in standards-track and standards-
related documentation can be found in BCP-11.

Copies of claims of rights made available for publication and any
assurances of licenses to be made available, or the result of an
attempt made to obtain a general license or permission for the use of
such proprietary rights by implementers or users of this specification
can be obtained from the IETF Secretariat.

The IETF invites any interested party to bring to its attention any
copyrights, patents or patent applications, or other proprietary
rights which may cover technology that may be required to practice
this standard. Please address the information to the IETF Executive
Director.

5. Acknowledgements

This document grew out of the work of the SNMP Configuration working
group. Keith McCloghrie suggested the fundamental change in
direction, from focusing on the RowPointers to focusing on the
conceptual rows being pointed to.

6. Security Considerations

This module does not define any management objects. Instead, it
defines a textual convention that may be used by other MIB modules to
define management objects.

Meaningful security considerations can only be written in the modules
that define management objects.

7. References

[1]   Bradner, S., "Key words for use in RFCs to Indicate Requirement
      Levels", BCP 14, RFC 2119, March 1997.

[2]   Harrington, D., Presuhn, R. and B. Wijnen, "An Architecture for
      Describing SNMP Management Frameworks", RFC 2571, April 1999.

[3]   Rose, M. and K. McCloghrie, "Structure and Identification of
      Management Information for TCP/IP-based Internets", STD 16, RFC
      1155, May 1990.

[4] Rose, M. and K. McCloghrie, "Concise MIB Definitions", STD 16,
     RFC 1212, March 1991.

[5]   Rose, M., "A Convention for Defining Traps for use with the
      SNMP", RFC 1215, March 1991.

[6]   McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose,
      M. and S. Waldbusser, "Structure of Management Information
      Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.

[7]   McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose,
      M. and S. Waldbusser, "Textual Conventions for SMIv2", STD 58,
      RFC 2579, April 1999.

[8]   McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose,
      M. and S. Waldbusser, "Conformance Statements for SMIv2", STD
      58, RFC 2580, April 1999.

[9]   Case, J., Fedor, M., Schoffstall, M. and J. Davin, "A Simple
      Network Management Protocol (SNMP)", STD 15, RFC 1157, May 1990.

[10] Case, J., McCloghrie, K., Rose, M. and S. Waldbusser,
      "Introduction to Community-based SNMPv2", RFC 1901, January
      1996.

[11] Case, J., McCloghrie, K., Rose, M. and S. Waldbusser,
      "Transport Mappings for Version 2 of the Simple Network
      Management Protocol (SNMPv2)", RFC 1906, January 1996.

[12] Case, J., Harrington, D., Presuhn, R. and B. Wijnen, "Message
      Processing and Dispatching for the Simple Network Management
      Protocol (SNMP)", RFC 2572, April 1999.

[13] Blumenthal, U. and B. Wijnen, "User-based Security Model (USM)
      for version 3 of the Simple Network Management Protocol
      (SNMPv3)", RFC 2574, April 1999.

[14] Case, J., McCloghrie, K., Rose, M. and S. Waldbusser,
      "Protocol Operations for Version 2 of the Simple Network
      Management Protocol (SNMPv2)", RFC 1905, January 1996.

[15] Levi, D., Meyer, P. and B. Stewart, "SNMP Applications", RFC
      2573, April 1999.

[16] Wijnen, B., Presuhn, R. and K. McCloghrie, "View-based Access
      Control Model (VACM) for the Simple Network Management
      Protocol (SNMP)", RFC 2575, April 1999.

[17] Case, J., Mundy, R., Partain, D. and B. Stewart, "Introduction
      to Version 3 of the Internet-standard Network Management
      Framework", RFC 2570, April 1999.

[18] Hazewinkel, H. and D. Partain, "The DiffServ Policy MIB", work in
     progress, draft-ietf-snmpconf-diffpolicy-04.txt, March 2001.

8. Authors' Addresses

Bob Moore
    IBM Corporation, BRQA/502
    4205 S. Miami Blvd.
    Research Triangle Park, NC 27709
    Phone: +1 919-254-4436
    Fax: +1 919-254-6243
    E-mail: remoore@us.ibm.com

Kwok Ho Chan
    Nortel Networks
    600 Technology Park Drive
    Billerica, MA 01821, USA
    E-mail: khchan@nortelnetworks.com

9. Full Copyright Statement