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NAT64 Management Information Base (MIB)
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Abstract

This memo describes the NAT64 Management Information Base. It reuses the NAT-MIB and add specific NAT64 variables.

Status of this Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

To enable IPv6-only nodes to access to IPv4-only nodes, a NAT64 [I-D.ietf-behave-v6v4-xlate-stateful] is used. This NAT64 requires a Management Information Base (MIB) for the purpose of managing the device.

The NAT-MIB [RFC4008] is designed to carry translation from any address family to any address family, therefore supports IPv6 to IPv4 translation such as NAT64.

Some specifics of NAT64 are not present in the NAT-MIB. This document describes the changes to fully support NAT64.

2. Modifications to NAT-MIB

A revision of [RFC4008] is proposed.

2.1. Pref64

The NAT64 uses a special prefix, named Pref64 [RFC6052], to carry IPv4 destination addresses into an IPv6 address. This prefix is required for the joint operation of NAT64 and DNS64[I-D.ietf-behave-dns64]. The operator can choose to use the Well-Known prefix (64:ff9b::/96) or a Network-Specific Prefix.

We propose to include this prefix to the NatAddrMapEntry. For other type of NATs, this value will be ignored and have a null value (::/0)

3. Configuring NAT64

This section presents considerations regarding NAT64 that doesn't require modification of the NAT-MIB.

3.1. NatTranslationEntity

NatTranslationEntity is: "An indication of a) the direction of a session for which an address map entry, address bind or port bind is applicable, and b) the entity (source or destination) within the session that is subject to translation."

For NAT64, both the source and destination is translated. Hence, two bits must be set:

"inboundSrcEndPoint" and "inboundDstEndPoint" if the operator chooses to configure the NAT64 address map entry on the IPv4 network interface.

or

"outboundSrcEndPoint" and "outboundDstEndPoint" if the operator chooses to configure the NAT64 address map entry on the IPv6 Internet interface.

3.2. Local and Private Terminology

Throughout [RFC4008] "private" and "public" are used interchangeably with "local" and "global" to refer to the networks the translator is operating on. "local" refer to the network where the NAT sessions are initiated. With NAT64, The IPv6 network corresponds to the "local" side and the "IPv4 Internet to the "global" side.

4. RFC4008 Proposed Changes

4.1. Changes to Section 3: Terminology

NAT Session:

"NAT sessions in the document are restricted to sessions based on TCP and UDP only." Add "ICMP". No changes needs to be made to the MIB definition ICMP can be specified as a protcocol session.

The "session" terminology also differs with [I-D.ietf-behave-v6v4-framework] definition: An "end-to-end session" in rfc4008 is a "session" in xlate.

4.2. Changes to Section 4: Overview

"The address map entry also identifies the end-point of the session that must be subject to translation.". For NAT64, this sentence implies the address map entry would contain pref64:: destination address. However, the real end-point is the ipv4 destination address.

4.2.1. Changes to Section 4.2: natAddrMapTable

Add a paragraph for pref64 variables. Refer to Section 4.3.2

Rephrase the last sentence to explain how to use NatTranslationEntity to describe NAT64.

4.2.2. Changes to Section 4.5: natSessionTable

"Session" terminology differs with draft-ietf-behave-v6v4-xlate-stateful's definition. A "end-to-end session" in rfc4008 is a "session" in xlate.

4.2.3. Changes to Section 4.7: Notifications

"natPacketDiscard notifies the end user/manager of packets being discarded due to lack of address mappings.". We must add: "or incompatibilities in IPv4/IPv6 translation.

4.2.4. Changes to Section 4.9: Configuration via the MIB

TBD: Add a point about how to configure the pref64 if its NAT64.

4.3. Changes to Section 5: Definitions

4.3.1. IMPORT

```
   Ipv6AddressPrefix,
           FROM IPV6-TC;
```

4.3.2. Update to NatAddrMapEntry

```
natAddrMapEntry OBJECT-TYPE
    SYNTAX      NatAddrMapEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
            "This entry represents an address map to be used for
             NAT and contributes to the dynamic and/or static
             address mapping tables of the NAT device."
    INDEX   { ifIndex, natAddrMapIndex }
    ::= { natAddrMapTable 1 }

NatAddrMapEntry ::= SEQUENCE {
    natAddrMapIndex                 NatAddrMapId,
    natAddrMapName                  SnmpAdminString,
    natAddrMapEntryType             NatAssociationType,
    natAddrMapTranslationEntity     NatTranslationEntity,
    natAddrMapLocalAddrType         InetAddressType,
    natAddrMapLocalAddrFrom         InetAddress,
    natAddrMapLocalAddrTo           InetAddress,
    natAddrMapLocalPortFrom         InetPortNumber,
    natAddrMapLocalPortTo           InetPortNumber,
    natAddrMapGlobalAddrType        InetAddressType,
    natAddrMapGlobalAddrFrom        InetAddress,
    natAddrMapGlobalAddrTo          InetAddress,
    natAddrMapGlobalPortFrom        InetPortNumber,
    natAddrMapGlobalPortTo          InetPortNumber,
    natAddrMapProtocol              NatProtocolMap,
    natAddrMapInTranslates          Counter64,
    natAddrMapOutTranslates         Counter64,
    natAddrMapDiscards              Counter64,
    natAddrMapAddrUsed              Gauge32,
    natAddrMapStorageType           StorageType,
    natAddrMapRowStatus             RowStatus
    natAddrMapPref64                Ipv6AddressPrefix
    natAddrMapPref64Length          INTEGER (0..128),
}
```

```
natAddrMapPref64 OBJECT-TYPE
    SYNTAX      Ipv6AddressPrefix
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
            "This object specifies the IPv6 address part of the Pref64
             for NAT64. For a NAT64, the default value is the Well-known
             prefix 64:ff9b::.  For other NAT types, the prefix is ::.
             The associated prefix length is found in
             natAddrMapPref64Length.
    ::= { natAddrMapEntry 22 }

natAddrMapPref64Length OBJECT-TYPE
    SYNTAX      INTEGER (0..128)
    MAX-ACCESS  read-create
    STATUS      current
    DESCRIPTION
      "The prefix length of natAddrMapPref64.  For NAT64, allowed values
       are: 32, 40, 48, 56, 64 and 96.".  For other NAT types, value is
       0."
    ::= { natAddrMapEntry 23 }
```

4.4. Complete updated NAT-MIB

Update is done in conformance to section 10 of [RFC2578].

TBD

5. Security Considerations

No additionnal security issues. See [RFC4008] section 7.

6. References

6.1. Normative References

[RFC2578] McCloghrie, K., Ed., Perkins, D., Ed., and J. Schoenwaelder, Ed., "Structure of Management Information Version 2 (SMIv2)", STD 58, RFC 2578, April 1999.

[RFC4008] Rohit, R., Srisuresh, P., Raghunarayan, R., Pai, N., and C. Wang, "Definitions of Managed Objects for Network Address Translators (NAT)", RFC 4008, March 2005.

[RFC6052] Bao, C., Huitema, C., Bagnulo, M., Boucadair, M., and X. Li, "IPv6 Addressing of IPv4/IPv6 Translators", RFC 6052, October 2010.

6.2. Informative References

[I-D.ietf-behave-dns64] Bagnulo, M., Sullivan, A., Matthews, P., and I. Beijnum, "DNS64: DNS extensions for Network Address Translation from IPv6 Clients to IPv4 Servers", draft-ietf-behave-dns64-11 (work in progress), October 2010.

[I-D.ietf-behave-v6v4-framework] Baker, F., Li, X., Bao, C., and K. Yin, "Framework for IPv4/IPv6 Translation", draft-ietf-behave-v6v4-framework-10 (work in progress), August 2010.

[I-D.ietf-behave-v6v4-xlate-stateful] Bagnulo, M., Matthews, P., and I. Beijnum, "Stateful NAT64: Network Address and Protocol Translation from IPv6 Clients to IPv4 Servers", draft-ietf-behave-v6v4-xlate-stateful-12 (work in progress), July 2010.

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