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DS-Lite Management Information Base (MIB)
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Abstract

This memo defines a portion of the Management Information Base (MIB) for using with network management protocols in the Internet community. In particular, it defines managed objects for DS-Lite.

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1. Introduction

Dual-Stack Lite [[RFC 6333](#)] is a solution to offer both IPv4 and IPv6 connectivity to customers crossing IPv6 only infrastructure. One of its key components is an IPv4-over-IPv6 tunnel, which is used to provide IPv4 connection across service provider IPv6 network. Another key component is a carrier-grade IPv4-IPv4 NAT to share service provider IPv4 addresses among customers.

This document defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. This MIB module may be used for configuration and monitoring the devices in the Dual-Stack Lite scenario. This MIB also can be extended to the application for Gateway Initiated Dual-Stack Lite.

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 \[RFC3410\]](#).

Managed objects are accessed via a virtual information store, termed the MIB. 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). This memo specifies a MIB module that is compliant to the SMIV2, which is described in [[RFC2578](#)], [[RFC2579](#)] and [[RFC2580](#)].

3. Terminology

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 [[RFC2119](#)].

4. Difference from the IP tunnel MIB and NAT MIB

The key technologies for DS-Lite are IP in IP (IPv4-in-IPv6) tunnel and NAT (IPv4 to IPv4 translation).

Notes: According to the [section 5.2 of RFC6333](#), DS-Lite only defines IPv4 in IPv6 tunnels at this moment, but other types of encapsulation could be defined in the future. So this DS-Lite MIB only support IP

in IP encapsulation, if the [RFC6333](#) defined other tunnel types in the future, this DS-Lite MIB will be updated then.

The NAT-MIB [[RFC4008](#)] is designed to carry translation from any address family to any address family, therefore supports IPv4 to IPv4 translation.

The tunnel MIB [[RFC4087](#)] is designed for managing tunnels of any type over IPv4 and IPv6 networks, therefore supports IP in IP tunnels.

However, NAT MIB and tunnel MIB together are not sufficient to support DS-Lite. This document describes the specific MIB requirements for DS-Lite, as below.

In DS-Lite scenario, the tunnel type is IP in IP, more precisely, is IPv4 in IPv6. Therefore, it is unnecessary to describe tunnel type in DS-Lite MIB.

In DS-Lite scenario, the translation type is IPv4 private address to IPv4 public address. Therefore, it is unnecessary to describe the type of address in the corresponding tunnelIfLocalInetAddress and tunnelIfRemoteInetAddress objects in DS-Lite MIB.

In DS-Lite scenario, the AFTR is not only the tunnel end concentrator, but also a 4-4 translator. Within the AFTR, tunnel information and translation information MUST be mapped each other. Two independent MIB is not able to reflect this mapping relationship. Therefore, a combined MIB is necessary.

If the Gateway Initiated Dual-Stack Lite scenario[I-D.ietf-softwire-gateway-init-ds-lite] is required, the MIB defined in this document could be easily extended for GI-DS-Lite. CID (Context Identifier) can be extended to the tunnel MIB to identifier the access devices which have the same IPv4 address. And both CID and SWID (Softwire Identifier) can be extended to the NAT MIB for performing the NAT binding look up.

The implementation of the IP Tunnel MIB is required for DS-Lite. The tunnelIfEncapsMethod in the tunnelIfEntry should be set to dsLite("xx"), and corresponding entry in the DS-Lite module will exist for every tunnelIfEntry with this tunnelIfEncapsMethod. The tunnelIfRemoteInetAddress must be set to ::.

5. Relationship to the IF-MIB

The Interfaces MIB [[RFC2863](#)] defines generic managed objects for managing interfaces. Each logical interface (physical or virtual) has an ifEntry. Tunnels are handled by creating a logical interface (ifEntry) for each tunnel. DS-Lite tunnel also acts as a virtual interface, which has corresponding entries in IP Tunnel MIB and Interface MIB. Those corresponding entries are indexed by ifIndex.

The ifOperStatus in ifTable would be used to represent whether the DS-Lite tunnel function has been originated. The ifInUcastPkts defined in ifTable will represent the number of IPv6 packets which have been encapsulated with IPv4 packets in it. The ifOutUcastPkts defined in ifTable contains the number of IPv6 packets which can be decapsulated to IPv4 in the virtual interface. Also, the IF-MIB defines ifMtu for the MTU of this tunnel interface, so DS-Lite MIB does not need to define the MTU for tunnel.

6. Structure of the MIB Module

The DS-Lite MIB provides a way to configure and manage the devices (AFTRs) in DS-Lite scenario through SNMP.

DS-Lite MIB is configurable on a per-interface basis. It depends on several parts of the IF-MIB [[RFC2863](#)], tunnel MIB [[RFC4087](#)], and NAT MIB [[RFC4008](#)].

6.1. The dsliteTunnel Subtree

The dsliteTunnel subtree describes managed objects used for managing tunnels in the DS-Lite scenario. Because some objects defined in Tunnel MIB are not access, a few new objects are defined in DS-Lite MIB.

6.2. The dsliteNAT Subtree

The dsliteNAT Subtree describes managed objects used for configuration as well as monitoring of AFTR which is capable of NAT function. Because the NAT MIB supports the NAT management function in DS-Lite, we may reuse it in DS-Lite MIB. The dsliteNAT Subtree also provides the information of mapping relationship between the tunnel MIB and NAT MIB by extending B4 address to the bind table in NAT MIB.

6.3. The dsliteInfo Subtree

The dsliteInfo Subtree provides the statistical information for DS-lite.

6.4. The dsliteTrap Subtree

The dsliteTrap Subtree provides trap information in DS-lite instance.

6.5. The dsliteConformance Subtree

The Subtree provides conformance information of MIB objects.

7. MIB modules required for IMPORTS

This MIB module IMPORTs objects from [[RFC4008](#)], [[RFC2580](#)], [[RFC2578](#)], [[RFC2863](#)], [[RFC4001](#)], [[RFC3411](#)].

8. Definitions

```
DSLite-MIB DEFFINITIONS ::= BEGIN
```

```
IMPORTS
```

```
    MODULE-IDENTITY, OBJECT-TYPE, mib-2, transmission,  
    Gauge32, Integer32, Counter64  
    FROM SNMPv2-SMI
```

```
    RowStatus, StorageType, DisplayString  
    FROM SNMPv2-TC
```

```
    ifIndex, InterfaceIndexOrZero  
    FROM IF-MIB
```

```
    IANA tunnelType  
    FROM IANAifType-MIB
```

```
    InetAddress, InetAddressIPv6, InetPortNumber  
    FROM INET-ADDRESS-MIB
```

```
    NatAddrMapId, natAddrMapName, natAddrMapEntryType,  
    natAddrMapLocalAddrFrom, natAddrMapLocalAddrTo,  
    natAddrMapLocalPortFrom, natAddrMapLocalPortTo,  
    natAddrMapGlobalAddrFrom, natAddrMapGlobalAddrTo,  
    natAddrMapGlobalPortFrom, natAddrMapGlobalPortTo,  
    natAddrPortBindGlobalAddr, natAddrPortBindGlobalPort,  
    NatBindId, natAddrPortBindSessions,  
    natAddrPortBindMaxIdleTime, natAddrPortBindCurrentIdleTime,
```


natAddrPortBindInTranslates, natAddrPortBindOutTranslates
FROM natMIB

dsliteMIB MODULE-IDENTITY

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ORGANIZATION "IETF Softwire Working Group"

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DESCRIPTION

"The MIB module is defined for management of object in the
DS-Lite scenario. "

::= { transmission xxx } --xxx to be replaced with correct
value

dsliteTunnel OBJECT IDENTIFIER

::= { dsliteMIB 1 }

dsliteNAT OBJECT IDENTIFIER

::= { dsliteMIB 2 }

dsliteInfo OBJECT IDENTIFIER

::= { dsliteMIB 3 }


```
dsliteTraps OBJECT IDENTIFIER
 ::= { dsliteMIB 4 }

--Conformance
dsliteConformance OBJECT IDENTIFIER
 ::= { dsliteMIB 5 }

--dsliteTunnel
--dsliteTunnelTable

dsliteTunnelTable OBJECT-TYPE
 SYNTAX      SEQUENCE OF dsliteTunnelEntry
 MAX-ACCESS  not-accessible
 STATUS      current
 DESCRIPTION
    "The (conceptual) table containing information on configured
    tunnels. This table can be used to map CPE address to the
    associated AFTR address. It can also be used for row
    creation."
 ::= { dsliteTunnel 1 }

dsliteTunnelEntry OBJECT-TYPE
 SYNTAX      dsliteTunnelEntry
 MAX-ACCESS  not-accessible
 STATUS      current
 DESCRIPTION
    "Each entry in this table contains the information on a
    particular configured tunnel."
    INDEX { dsliteTunnelStartAddress,
            dsliteTunnelEndAddress,
            ifIndex }
 ::= { dsliteTunnelTable 1 }

dsliteTunnelEntry ::=
 SEQUENCE {
    dsliteTunnelStartAddress      InetAddressIPv6,
    dsliteTunnelStartAddPreLen    Integer32,
    dsliteTunnelEndAddress        InetAddressIPv6,
    dsliteTunnelStatus            RowStatus,
    dsliteTunnelStorageType       StorageType
 }

dsliteTunnelStartAddress OBJECT-TYPE
 SYNTAX      InetAddressIPv6
 MAX-ACCESS  read-create
 STATUS      current
 DESCRIPTION
```



```
    "The address of the start point of the tunnel."  
    ::= { dsliteTunnelEntry 1 }
```

dsliteTunnelStartAddPreLen OBJECT-TYPE

```
    SYNTAX Integer32 (0..128)  
    MAX-ACCESS read-create  
    STATUS current  
    DESCRIPTION  
        "IPv6 prefix length of the IP address of the  
        start point of the tunnel."  
    ::= { dsliteTunnelEntry 2 }
```

dsliteTunnelEndAddress OBJECT-TYPE

```
    SYNTAX      InetAddressIPv6  
    MAX-ACCESS read-create  
    STATUS      current  
    DESCRIPTION  
        "The address of the endpoint of the tunnel."  
    ::= { dsliteTunnelEntry 3 }
```

dsliteTunnelStatus OBJECT-TYPE

```
    SYNTAX      RowStatus  
    MAX-ACCESS read-create  
    STATUS      current  
    DESCRIPTION  
        "The status of this row, by which new entries may be  
        created, or old entries deleted from this table."  
    ::= { dsliteTunnelEntry 4 }
```

dsliteTunnelStorageType OBJECT-TYPE

```
    SYNTAX      StorageType  
    MAX-ACCESS read-create  
    STATUS      current  
    DESCRIPTION  
        "The storage type of this row. If the row is  
        permanent(4), no objects in the row need be  
        writable."  
    ::= { dsliteTunnelEntry 5 }
```

```
--dsliteNAT  
--dsliteNATMapTable(define address pool)  
--dsliteNATBindTable
```

dsliteNATMapTable OBJECT-TYPE

```
    SYNTAX      SEQUENCE OF dsliteNATMapEntry  
    MAX-ACCESS not-accessible
```



```
STATUS      current
DESCRIPTION
    "This table contains information about address map
    parameters."
:: = { dsliteNAT 1 }

dsliteNATMapEntry OBJECT-TYPE
SYNTAX      dsliteNATMapEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    " This entry represents an address map to be used for
    NAT and contributes to the address mapping tables of
    AFTR."
INDEX       { ifIndex,
              dsliteNATMapIndex }
:: = { dsliteNATMapTable 1 }

dsliteNATMapEntry ::=
    SEQUENCE {
        dsliteNATMapIndex          NatAddrMapId,
        dsliteNATMapAddrName       natAddrMapName,
        dsliteNATMapEntryType      natAddrMapEntryType,
        dsliteNATMapLocalAddrFrom  natAddrMapLocalAddrFrom,
        dsliteNATMapLocalAddrTo   natAddrMapLocalAddrTo,
        dsliteNATMapLocalPortFrom  natAddrMapLocalPortFrom,
        dsliteNATMapLocalPortTo   natAddrMapLocalPortTo,
        dsliteNATMapGlobalAddrFrom natAddrMapGlobalAddrFrom,
        dsliteNATMapGlobalAddrTo  natAddrMapGlobalAddrTo,
        dsliteNATMapGlobalPortFrom natAddrMapGlobalPortFrom,
        dsliteNATMapGlobalPortTo  natAddrMapGlobalPortTo,
        dsliteNATMapAddrUsed       natAddrMapAddrUsed,
        dsliteNATMapStorageType    StorageType,
        dsliteNATMapRowStatus      RowStatus
    }

dsliteNATMapIndex OBJECT-TYPE
SYNTAX      NatAddrMapId
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Along with ifIndex, this object uniquely
    identifies an entry in the dsliteNATMapTable.
    Address map entries are applied in the order
    specified by dsliteNATMapIndex."
::= { dsliteNATMapEntry 1 }
```


dsliteNATMapAddrName OBJECT-TYPE

SYNTAX natAddrMapName

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Name identifying all map entries in the table associated with the same interface. All map entries with the same ifIndex MUST have the same map name."

::= { dsliteNATMapEntry 2 }

dsliteNATMapEntryType OBJECT-TYPE

SYNTAX natAddrMapEntryType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This parameter can be used to set up static or dynamic address maps."

::= { dsliteNATMapEntry 3 }

dsliteNATMapLocalAddrFrom OBJECT-TYPE

SYNTAX natAddrMapLocalAddrFrom

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object specifies the first IP address of the range of IP addresses mapped by this translation entry. The value of this object must be less than or equal to the value of the dsliteNATMapLocalAddrTo object."

::= { dsliteNATMapEntry 4 }

dsliteNATMapLocalAddrTo OBJECT-TYPE

SYNTAX natAddrMapLocalAddrTo

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object specifies the last IP address of the range of IP addresses mapped by this translation entry. If only a single address is being mapped, the value of this object is equal to the value of natAddrMapLocalAddrFrom. The value of this object must be greater than or equal to the value of the natAddrMapLocalAddrFrom object."

::= { dsliteNATMapEntry 5 }

dsliteNATMapLocalPortFrom OBJECT-TYPE

SYNTAX natAddrMapLocalPortFrom

MAX-ACCESS read-create


```
STATUS      current
DESCRIPTION
    "The value of this object must be less than or equal
    to the value of the dsliteNATMapLocalPortTo object.
    If the translation specifies a single port, then the
    value of this object is equal to the value of
    dsliteNATMapLocalPortTo."
DEFVAL { 0 }
::= { dsliteNATMapEntry 6 }

dsliteNATMapLocalPortTo OBJECT-TYPE
SYNTAX      natAddrMapLocalPortTo
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The value of this object must be greater than or equal
    to the value of the dsliteNATMapLocalPortFrom object.
    If the translation specifies a single port, then
    the value of this object is equal to the value of
    dsliteNATMapLocalPortFrom."
DEFVAL { 0 }
::= { dsliteNATMapEntry 7 }

dsliteNATMapGlobalAddrFrom OBJECT-TYPE
SYNTAX      natAddrMapGlobalAddrFrom
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object specifies the first IP address of
    the range of IP addresses being mapped to.
    The value of this object must be less than
    or equal to the value of the
    dsliteNATMapGlobalAddrTo object.
::= { dsliteNATMapEntry 8 }

dsliteNATMapGlobalAddrTo OBJECT-TYPE
SYNTAX      natAddrMapGlobalAddrTo
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object specifies the last IP address of the range
    of IP addresses being mapped to. If only a single
    address is being mapped to, the value of this object
    is equal to the value of dsliteNATMapGlobalAddrFrom.
    The value of this object must be greater than or equal
    to the value of the dsliteNATMapGlobalAddrFrom object.
::= { dsliteNATMapEntry 9 }
```


dsliteNATMapGlobalPortFrom OBJECT-TYPE

SYNTAX natAddrMapGlobalPortFrom

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of this object must be less than or equal to the value of the dsliteNATMapGlobalPortTo object. If the translation specifies a single port, then the value of this object is equal to the value dsliteNATMapGlobalPortTo."

DEFVAL { 0 }

::= { dsliteNATMapEntry 10 }

dsliteNATMapGlobalPortTo OBJECT-TYPE

SYNTAX natAddrMapGlobalPortTo

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The value of this object must be greater than or equal to the value of the dsliteNATMapGlobalPortFrom object. If the translation specifies a single port, then the value of this object is equal to the value of dsliteNATMapGlobalPortFrom."

DEFVAL { 0 }

::= { dsliteNATMapEntry 11 }

dsliteNATMapAddrUsed OBJECT-TYPE

SYNTAX natAddrMapAddrUsed

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The number of addresses pertaining to this address map that are currently being used from the NAT pool."

::= { dsliteNATMapEntry 12 }

dsliteNATMapStorageType OBJECT-TYPE

SYNTAX StorageType

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"The storage type for this conceptual row. Conceptual rows having the value 'permanent' need not allow write-access to any columnar objects in the row."

REFERENCE

"Textual Conventions for SMIV2, [Section 2](#)."


```
DEFVAL { nonVolatile }
::= { dsliteNATMapEntry 13 }
```

dsliteNATMapRowStatus OBJECT-TYPE

```
SYNTAX      RowStatus
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "The status of this conceptual row."
REFERENCE
    "Textual Conventions for SMIV2, Section 2."
::= { dsliteNATMapEntry 14 }
```

dsliteNATBindTable OBJECT-TYPE

```
SYNTAX      SEQUENCE OF dsliteNATBindEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "This table contains information about currently
    active NAT binds in AFTR. This table extends the
    natAddrPortBindTable designed in NAT MIB (RFC
    4008) by IPv6 address of B4."
:: = { dsliteNAT 2 }
```

dsliteNATBindEntry OBJECT-TYPE

```
SYNTAX      dsliteNATBindEntry
MAX-ACCESS  not-accessible
STATUS      current
DESCRIPTION
    "Each entry in this table holds the relationship between
    tunnel information and nat bind information. These entries
    are lost upon agent restart."
INDEX       { ifIndex,
              dsliteNATBindLocalAddr,
              dsliteNATBindLocalPort,
              dsliteB4Addr }
:: = { dsliteNATBindTable 1 }
```

dsliteNATBindEntry ::=

```
SEQUENCE {
    dsliteNATBindLocalAddr      InetAddress,
    dsliteNATBindLocalPort      InetPortNumber,
    dsliteNATBindGlobalAddr     natAddrPortBindGlobalAddr,
    dsliteNATBindGlobalPort     natAddrPortBindGlobalPort,
    dsliteNATBindId             NatBindId,
    dsliteB4Addr                dsliteTunnelStartAddress,
    dsliteB4PreLen              dsliteTunnelStartAddPreLen,
```



```
    dsliteNATBindMapIndex      NatAddrMapId,
    dsliteNATBindSessions      natAddrPortBindSessions,
    dsliteNATBindMaxIdleTime    natAddrPortBindMaxIdleTime,
    dsliteNATBindCurrentIdleTime natAddrPortBindCurrentIdleTime,
    dsliteNATBindInTranslates  natAddrPortBindInTranslates,
    dsliteNATBindOutTranslates natAddrPortBindOutTranslates
}
```

dsliteNATBindLocalAddr OBJECT-TYPE

```
SYNTAX      InetAddress
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object represents the private IP address of host."
 ::= { dsliteNATBindEntry 1 }
```

dsliteNATBindLocalPort OBJECT-TYPE

```
SYNTAX      InetPortNumber
MAX-ACCESS  read-create
STATUS      current
DESCRIPTION
    "This object represents the private-realm Port
     number of host."
 ::= { dsliteNATBindEntry 2 }
```

dsliteNATBindGlobalAddr OBJECT-TYPE

```
SYNTAX      natAddrPortBindGlobalAddr
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object represents the public-realm IP
     address of host."
 ::= { dsliteNATBindEntry 3 }
```

dsliteNATBindGlobalPort OBJECT-TYPE

```
SYNTAX      natAddrPortBindGlobalPort
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
    "This object represents the public-realm Port number
     of host."
 ::= { dsliteNATBindEntry 4 }
```

dsliteNATBindId OBJECT-TYPE

```
SYNTAX      NatBindId
MAX-ACCESS  read-only
STATUS      current
```


DESCRIPTION

"This object represents a bind id that is dynamically assigned to each bind by AFTR. Each bind is represented by a unique bind id across the dsliteNATBindTable."

::= { dsliteNATBindEntry 5 }

dsliteB4Addr OBJECT-TYPE

SYNTAX dsliteTunnelStartAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object represents the relationship between tunnel start point to the Bind entry, which extends the source IPv6 address of packet to the Bind table."

::= { dsliteNATBindEntry 6 }

dsliteB4PreLen OBJECT-TYPE

SYNTAX dsliteTunnelStartAddPreLen

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object indicates the IPv6 prefix length of the start point of tunnel, which is also need to extend to the Bind table."

::= { dsliteNATBindEntry 7 }

dsliteNATBindMapIndex OBJECT-TYPE

SYNTAX NatAddrMapId

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This object is a pointer to the dsliteNATMapTable entry used in creating this BIND."

::= { dsliteNATBindEntry 8 }

dsliteNATBindSessions OBJECT-TYPE

SYNTAX natAddrPortBindSessions

MAX-ACCESS read-only

STATUS current

DESCRIPTION

" This object represents the number of sessions currently using this BIND."

::= { dsliteNATBindEntry 9 }

dsliteNATBindMaxIdleTime OBJECT-TYPE

SYNTAX natAddrPortBindMaxIdleTime


```
    MAX-ACCESS read-only
    STATUS      current
DESCRIPTION
    "This object indicates the maximum time for
    which this bind can be idle without any sessions
    attached to it."
 ::= { dsliteNATBindEntry 10 }
```

```
dsliteNATBindCurrentIdleTime OBJECT-TYPE
    SYNTAX      natAddrPortBindCurrentIdleTime
    MAX-ACCESS read-only
    STATUS      current
DESCRIPTION
    "At any given instance, this object indicates the
    time that this bind has been idle without any sessions
    attached to it."
 ::= { dsliteNATBindEntry 11 }
```

```
dsliteNATBindInTranslates OBJECT-TYPE
    SYNTAX      natAddrPortBindInTranslates
    MAX-ACCESS read-only
    STATUS      current
DESCRIPTION
    "The number of inbound packets that were
    translated as per this bind entry."
 ::= { dsliteNATBindEntry 12 }
```

```
dsliteNATBindOutTranslates OBJECT-TYPE
    SYNTAX      natAddrPortBindOutTranslates
    MAX-ACCESS read-only
    STATUS      current
DESCRIPTION
    "The number of outbound packets that were
    translated as per this bind entry."
 ::= { dsliteNATBindEntry 13 }
```

```
--dsliteInfo
```

```
dsliteSessionLimitTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF dsliteSessionLimitEntry
    MAX-ACCESS not-accessible
    STATUS      current
DESCRIPTION
    "The (conceptual) table containing information about session
    limit. It can also be used for row creation."
 ::= { dsliteInfo 1 }
```



```
dsliteSessionLimitEntry OBJECT-TYPE
    SYNTAX      dsliteSessionLimitEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "Each entry in this table contains the information to be
        used for configuring session limits for DS-lite."
    INDEX       { dsliteInstanceName,
                  dsliteSessionLimitaType }
    ::= { dsliteSessionLimitTable 1 }
```

```
dsliteSessionLimitEntry ::=
    SEQUENCE {
        dsliteSessionLimitInstanceName      DisplayString,
        dsliteSessionLimitType              INTEGER,
        dsliteSessionLimitNumber            Integer32,
        dsliteSessionLimitStorageType       StorageType,
        dsliteSessionLimitRowStatus         RowStatus
    }
```

```
dsliteSessionLimitInstanceName OBJECT-TYPE
    SYNTAX      DisplayString (SIZE (1..31))
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        " This object represents the instance name
        that is limited."
    ::= { dsliteSessionLimitEntry 1 }
```

```
dsliteSessionLimitType OBJECT-TYPE
    SYNTAX      INTEGER
    {
        tcp(0),
        udp(1),
        icmp(2),
        total(3)
    }
    MAX-ACCESS  read-only
    STATUS      current
    DESCRIPTION
        "This object represents the session limit type :
        tcp or udp or totally."
    ::= { dsliteSessionLimitEntry 2 }
```

```
dsliteSessionLimitNumber OBJECT-TYPE
    SYNTAX      Integer32 (1..65535)
    MAX-ACCESS  read-create
```



```
STATUS current
DESCRIPTION
    " This table represents the limit number of the session."
 ::= { dsliteSessionLimitEntry 3 }

dsliteSessionLimitStorageType OBJECT-TYPE
SYNTAX StorageType
MAX-ACCESS read-create
STATUS current
DESCRIPTION
    "The storage type for this conceptual row. Conceptual
    rows having the value 'permanent' need not allow
    write-access to any columnar objects in the row."
 ::= { dsliteSessionLimitEntry 4 }

dsliteSessionLimitRowStatus OBJECT-TYPE
SYNTAX RowStatus
MAX-ACCESS read-create
STATUS current
DESCRIPTION
    " The status of this conceptual row."
REFERENCE
    "Textual Conventions for SMIV2, Section 2."
DEFVAL { nonVolatile }
 ::= { dsliteSessionLimitEntry 5 }

dslitePortLimitTable OBJECT-TYPE
SYNTAX SEQUENCE OF dslitePortLimitEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "This table is used to configure port limits for a
    DS-Lite instance."
 ::= { dsliteInfo 2 }

dslitePortLimitEntry OBJECT-TYPE
SYNTAX dslitePortLimitEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
    "Each entry in this table contains the information to be
    used for configuring port limits for DS-lite."
INDEX { dslitePortLimitInstanceName,
        dslitePortLimitType }
 ::= { dslitePortLimitTable 1 }
```



```
dslitePortLimitEntry ::=
    SEQUENCE {
        dslitePortLimitInstanceName      DisplayString,
        dslitePortLimitType               INTEGER,
        dslitePortLimitNumber             Integer32,
        dslitePortLimitStorageType        StorageType,
        dslitePortLimitRowStatus          RowStatus
    }
```

```
dslitePortLimitInstanceName OBJECT-TYPE
    SYNTAX DisplayString (SIZE (1..31))
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        " This object represents the instance name
          that is limited."
    ::= { dslitePortLimitEntry 1 }
```

```
dslitePortLimitType OBJECT-TYPE
    SYNTAX INTEGER
    {
        tcp(0),
        udp(1),
        icmp(2),
        total(3)
    }
    MAX-ACCESS read-only
    STATUS current
    DESCRIPTION
        "This object represents the port limit
         type: tcp or udp or totally."
    ::= { dslitePortLimitEntry 2 }
```

```
dslitePortLimitNumber OBJECT-TYPE
    SYNTAX Integer32 (1..300000)
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
        "This object represents the limit number of the
         port usage."
    ::= { dslitePortLimitEntry 3 }
```

```
dslitePortLimitStorageType OBJECT-TYPE
    SYNTAX StorageType
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
```


"The storage type for this conceptual row. Conceptual rows having the value 'permanent' need not allow write-access to any columnar objects in the row."
::= { dslitePortLimitEntry 4 }

dslitePortLimitRowStatus OBJECT-TYPE

SYNTAX RowStatus

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"Create or delete table row."

::= { dslitePortLimitEntry 5 }

dsliteAFTRAlarmScalar OBJECT IDENTIFIER ::= { dsliteInfo 3 }

dsliteAFTRAlarmB4Addr OBJECT-TYPE

SYNTAX dsliteTunnelStartAddress

MAX-ACCESS accessible-for-notify

STATUS current

DESCRIPTION

"This object indicate the IP address of B4 that send alarm "

::= { dsliteAFTRAlarmScalar 1 }

dsliteAFTRAlarmProtocolType OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS accessible-for-notify

STATUS current

DESCRIPTION

"This object indicate the procotol type of alarm,
0:tcp,1:udp,2:icmp,3:total "

::= { dsliteAFTRAlarmScalar 2 }

dsliteAFTRAlarmMapAddrName OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS accessible-for-notify

STATUS current

DESCRIPTION

"This object indicate the name of dsliteNATMapAddrName "

::= { dsliteAFTRAlarmScalar 3 }

dsliteAFTRAlarmSpecificIP OBJECT-TYPE

SYNTAX DisplayString

MAX-ACCESS accessible-for-notify

STATUS current

DESCRIPTION

" This object indicate the IP address whose port usage


```
        reach threshold "
 ::= { dsliteAFTRAlarmScalar 4 }

dsliteAFTRAlarmConnectNumber OBJECT-TYPE
    SYNTAX Integer32 (60..90)
    MAX-ACCESS read-write
    STATUS current
    DESCRIPTION
        " This object indicate the threshold of DS-Lite
          connections alarm."
    ::= { dsliteAFTRAlarmScalar 5 }

dsliteStatisticTable OBJECT-TYPE
    SYNTAX SEQUENCE OF dsliteStatisticEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table provides statistical information
          of DS-Lite."
    ::= { dsliteInfo 4 }

dsliteStatisticEntry OBJECT-TYPE
    SYNTAX dsliteStatisticEntry
    MAX-ACCESS not-accessible
    STATUS current
    DESCRIPTION
        "This table provides statistical information
          of DS-Lite."
    INDEX { dsliteStatisticInstanceName }
    ::= { dsliteStatisticTable 1 }

dsliteStatisticEntry ::=
    SEQUENCE {
        dsliteStatisticInstanceName      DisplayString,
        dsliteStatisticDiscard            Counter64,
        dsliteStatisticReceived           Counter64,
        dsliteStatisticTransmitted        Counter64,
        dsliteStatisticIpv4Session         Counter64,
        dsliteStatisticIpv6Session         Counter64,
        dsliteStatisticStorageType        StorageType,
        dsliteStatisticRowStatus           RowStatus
    }

dsliteStatisticInstanceName OBJECT-TYPE
    SYNTAX DisplayString (SIZE (1..31))
    MAX-ACCESS read-only
    STATUS current
```


DESCRIPTION

" This object indicate the instance name
that is limited."

::= { dsliteStatisticEntry 1 }

dsliteStatisticDiscard OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-create

STATUS current

DESCRIPTION

" This object indicate the count number of
the discarded packet."

::= { dsliteStatisticEntry 2 }

dsliteStatisticReceived OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object indicate the count number of
received packet count."

::= { dsliteStatisticEntry 3 }

dsliteStatisticTransmitted OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-create

STATUS current

DESCRIPTION

"This object indicate the count number of
transmitted packet count."

::= { dsliteStatisticEntry 4 }

dsliteStatisticIpv4Session OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-create

STATUS current

DESCRIPTION

" This object indicate the number of the
current IPv4 Session."

::= { dsliteStatisticEntry 5 }

dsliteStatisticIpv6Session OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-create

STATUS current

DESCRIPTION


```
        " This object indicate the number of the
          current IPv6 Session."
 ::= { dsliteStatisticEntry 6 }

dsliteStatisticRowStatus OBJECT-TYPE
    SYNTAX RowStatus
    MAX-ACCESS read-create
    STATUS current
    DESCRIPTION
        "Create or delete table row."
    ::= { dsliteStatisticEntry 7 }

--dslite trap

dsliteTunnelNumAlarm NOTIFICATION-TYPE
    STATUS current
    DESCRIPTION
        "This trap is triggered when dslite tunnel
        reach the threshold."
    ::= { dsliteTraps 1 }

dsliteAFTRUserSessionNumAlarm NOTIFICATION-TYPE
    OBJECTS { dsliteAFTRAlarmProtocolType,
              dsliteAFTRAlarmB4Addr }
    STATUS current
    DESCRIPTION
        " This trap is triggered when sessions of
        user reach the threshold."
    ::= { dsliteTraps 2 }

dsliteAFTRPortUsageOfSpecificIpAlarm NOTIFICATION-TYPE
    OBJECTS { dsliteAFTRAlarmMapAddrName,
              dsliteAFTRAlarmSpecificIP }
    STATUS current
    DESCRIPTION
        "This trap is triggered when used NAT
        ports of map address reach the threshold."
 ::= { dsliteTraps 3 }

--Module Conformance statement

dsliteCompliances OBJECT IDENTIFIER ::= { dsliteConformance 1 }

dsliteCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "Description."
```



```
MODULE -- this module
    MANDATORY-GROUPS { dsliteNATMapGroup,
                        dsliteTunnelGroup }
 ::= { dsliteCompliances 1 }

dsliteGroups OBJECT IDENTIFIER ::= { dsliteConformance 2 }

dsliteAFTRAlarmScalarGroup OBJECT-GROUP
    OBJECTS { dsliteAFTRAlarmB4Addr, dsliteAFTRAlarmProtocolType,
              dsliteAFTRAlarmMapAddrName, dsliteAFTRAlarmSpecificIP,
              dsliteAFTRAlarmConnectNumber }
    STATUS current
    DESCRIPTION
        " The collection of this objects are used to give the
          information about AFTR alarming Scalar."
 ::= { dsliteGroups 1 }

dsliteNATMapGroup OBJECT-GROUP
    OBJECTS { dsliteNATMapIndex, dsliteNATMapAddrName,
              dsliteNATMapEntryType, dsliteNATMapLocalAddrFrom,
              dsliteNATMapLocalAddrTo, dsliteNATMapLocalPortFrom,
              dsliteNATMapLocalPortTo, dsliteNATMapGlobalAddrFrom,
              dsliteNATMapGlobalAddrTo, dsliteNATMapGlobalPortFrom,
              dsliteNATMapGlobalPortTo, dsliteNATMapAddrUsed,
              dsliteNATMapStorageType, dsliteNATMapRowStatu }
    STATUS current
    DESCRIPTION
        " The collection of this objects are used to give the
          information about NAT address mapping."
 ::= { dsliteGroups 2 }

dsliteTunnelGroup OBJECT-GROUP
    OBJECTS { dsliteTunnelStartAddress, dsliteTunnelStartAddPreLen,
              dsliteTunnelEndAddress,
              dsliteTunnelStatus,
              dsliteTunnelStorageType }
    STATUS current
    DESCRIPTION
        " The collection of this objects are used to give the
          information of tunnel in ds-lite."
 ::= { dsliteGroups 3 }

dsliteNATBindGroup OBJECT-GROUP
    OBJECTS { dsliteNATBindLocalAddr, dsliteNATBindLocalPort,
              dsliteNATBindGlobalAddr, dsliteNATBindGlobalPort,
              dsliteNATBindId, dsliteB4Addr, dsliteB4PreLen,
              dsliteNATBindMapIndex, dsliteNATBindSessions,
```



```
        dsliteNATBindMaxIdleTime,
        dsliteNATBindCurrentIdleTime,
        dsliteNATBindInTranslates,
        dsliteNATBindOutTranslates }
STATUS current
DESCRIPTION
    " The collection of this objects are used to give the
      information about NAT Bind."
 ::= { dsliteGroups 4 }

dsliteSessionLimitGroup OBJECT-GROUP
OBJECTS { dsliteSessionLimitInstanceName,
          dsliteSessionLimitType, dsliteSessionLimitNumber,
          dsliteSessionLimitStorageType,
          dsliteSessionLimitRowStatus }
STATUS current
DESCRIPTION
    " The collection of this objects are used to give the
      information about port limit."
 ::= { dsliteGroups 5 }

dslitePortLimitGroup OBJECT-GROUP
OBJECTS { dslitePortLimitInstanceName,
          dslitePortLimitType, dslitePortLimitNumber,
          dslitePortLimitStorageType,
          dslitePortLimitRowStatus }
STATUS current
DESCRIPTION
    " The collection of this objects are used to give the
      information about port limit."
 ::= { dsliteGroups 6 }

dsliteStatisticGroup OBJECT-GROUP
OBJECTS { dsliteStatisticInstanceName,
          dsliteStatisticDiscard,
          dsliteStatisticReceived,
          dsliteStatisticTransmitted,
          dsliteStatisticIpv4Session,
          dsliteStatisticIpv6Session,
          dsliteStatisticStorageType,
          dsliteStatisticRowStatus }
STATUS current
DESCRIPTION
    " The collection of this objects are used to give the
      statistical information of ds-lite."
 ::= { dsliteGroups 7 }
```



```
dsliteTrapsGroup NOTIFICATION-GROUP
  NOTIFICATIONS { dsliteTunnelNumAlarm,
                  dsliteAFTRUserSessionNumAlarm,
                  dsliteAFTRPortUsageOfSpecificIpAlarm }
  STATUS current
  DESCRIPTION
    "The collection of this objects are used to give the
    trap information of ds-lite."
  ::= { dsliteGroups 8 }

  END
```

9. Extending this MIB for Gateway Initiated Dual-Stack Lite

Similar to DS-lite, GI-DS-lite enables the service provider to share public IPv4 addresses among different customers by combining tunneling and NAT. GI-DS-lite extends existing access tunnels beyond the access gateway to an IPv4-IPv4 NAT using softwires with an embedded context identifier that uniquely identifies the end host the tunneled packets belong to. The MIB defined in this document can easily be extended to use for GI-DS-Lite scenario. New object as CID SHOULD be extended to the dsliteTunnelTable. And a new object as dsliteTunnelID can be defined in DS-Lite MIB as SWID in GI-DS-Lite. Both CID and SWID SHOULD be extended to the dsliteNATBindTable. It will use the combination of CID and SWID as the unique identifier for the end host and store it in the NAT binding entry.

10. IANA Considerations

The MIB module in this document uses the following IANA-assigned OBJECT IDENTIFIER values recorded in the SMI Numbers registry, and the following IANA-assigned tunnelType values recorded in the IANA tunnelType-MIB registry:

Descriptor	OBJECT IDENTIFIER value
-----	-----
DSLite-MIB	{ transmission XXX }

IANA tunnelType ::= TEXTUAL-CONVENTION

SYNTAX	INTEGER {
	dsLite ("XX")
	-- dslite tunnel
	}

Notes: As the [Appendix A](#) of the IP Tunnel MIB[RFC4087] described that it has already assigned the value direct(2) to indicate the tunnel type is IP in ip tunnel, but it is still difficult to distinguish the DS-Lite tunnel packets and the normal IP in IP tunnel packets in the scenario of the AFTR connecting to both the DS-lite tunnel and IP in IP tunnel.

[11.](#) Security Considerations

The DS-Lite MIB module can be used for configuration of certain objects, and anything that can be incorrectly configured, with potentially disastrous results. Because this MIB module reuses the IP tunnel MIB and nat MIB, the security considerations for these MIBs are also applicable to the DS-Lite MIB.

Unauthorized read access todsliteTunnelEndAddress, or any object in the dsliteBindRelationTable or dslitePortBindRelationTable would reveal information about the mapping information.

SNMP versions prior to SNMPv3 did not include adequate security. Even if the network itself is secure (for example by using IPSec), even then, there is no control as to who on the secure network is allowed to access and GET/SET (read/change/create/delete) the objects in this MIB module.

It is RECOMMENDED that implementers consider the security features as provided by the SNMPv3 framework (see [\[RFC3410\]](#), [section 8](#)), including full support for the SNMPv3 cryptographic mechanisms (for authentication and privacy).

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

[12.](#) References

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13. Change Log [RFC Editor please remove]

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