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D. Fedyk
E. Kinzie
LabN Consulting, L.L.C.
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Definitions of Managed Objects for IP Traffic Flow Security
draft-ietf-ipsecme-mib-iptfs-01

Abstract

This document describes managed objects for the the management of IP Traffic Flow Security additions to IKEv2 and IPsec. This document provides a read only version of the objects defined in the YANG module for the same purpose.

This is an unpublished work in progress.

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Internet-Draft

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[1.](#) Introduction

This document defines a Management Information Base (MIB) module for use with network management protocols in the Internet community. Traffic Flow Security (IP-TFS) extensions as defined in [\[I-D.ietf-ipsecme-iptfs\]](#). IP-TFS provides enhancements to an IPsec tunnel Security Association to provide improved traffic confidentiality.

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 Management Information Base or 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 STD 58, [\[RFC2578\]](#), STD 58, [\[RFC2579\]](#) and STD 58, [\[RFC2580\]](#).

The objects defined here are the same as [\[I-D.ietf-ipsecme-yang-iptfs\]](#) with the exception that only operational data is supported. This module uses the YANG model as a reference point for managed objects. Note an IETF MIB model for IPsec was never standardized however the structures here could be adapted to existing MIB implementations.

[2.](#) Terminology & Concepts

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 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

3. Overview

This document defines configuration and operational parameters of IP traffic flow security (IP-TFS). IP-TFS, defined in [I-D.ietf-ipsecme-iptfs], configures a security association for tunnel mode IPsec with characteristics that improve traffic confidentiality and reduce bandwidth efficiency loss.

This document is based on the concepts and management model defined in [I-D.ietf-ipsecme-yang-iptfs]. This documents assume familiarity with IP security concepts described in [RFC4301], IP-TFS as described in [I-D.ietf-ipsecme-iptfs] and the IP-TFS management model described in [I-D.ietf-ipsecme-yang-iptfs].

This document specifies an extensible operational model for IP-TFS. It reuses the management model defined in [I-D.ietf-ipsecme-yang-iptfs]. It allows SNMP systems to read configured and operational objects of IPTFS.

4. Management Objects

4.1. MIB Tree

The following is the MIB registration tree diagram for the IP-TFS extensions.

```
# IETF-IPTFS-MIB registration tree (generated by smidump 0.4.8)
```

```
--iptfsMIB(1.3.6.1.3.500)
  +--iptfsMIBObjects(1)
    | +--iptfsGroup(1)
    | | +--iptfsConfigTable(1)
    | | | +--iptfsConfigTableEntry(1) [iptfsConfigSaIndex]
    | | |   +-- --- Integer32      iptfsConfigSaIndex(1)
    | | |   +-- r-n TruthValue    congestionControl(2)
    | | |   +-- r-n TruthValue    usePathMtu(3)
```

```

| |         +-- r-n UnsignedShort  outerPacketSize(4)
| |         +-- r-n Counter64      l2FixedRate(5)
| |         +-- r-n Counter64      l3FixedRate(6)
| |         +-- r-n TruthValue     dontFragment(7)
| |         +-- r-n NanoSeconds    maxAggregationTime(8)
| |         +-- r-n Unsigned32     windowSize(9)
| |         +-- r-n TruthValue     sendImmediately(10)
| |         +-- r-n NanoSeconds    lostPktTimerInt(11)
| +--ipsecStatsGroup(2)
| |   +--ipsecStatsTable(1)
| |     +--ipsecStatsTableEntry(1) [ipsecSaIndex]
| |       +-- --- Integer32 ipsecSaIndex(1)

```

```

| |         +-- r-n Counter64 txPackets(2)
| |         +-- r-n Counter64 txOctets(3)
| |         +-- r-n Counter64 txDropPackets(4)
| |         +-- r-n Counter64 rxPackets(5)
| |         +-- r-n Counter64 rxOctets(6)
| |         +-- r-n Counter64 rxDropPackets(7)
| +--iptfsInnerStatsGroup(3)
| |   +--iptfsInnerStatsTable(1)
| |     +--iptfsInnerStatsTableEntry(1) [iptfsInnerSaIndex]
| |       +-- --- Integer32 iptfsInnerSaIndex(1)
| |       +-- r-n Counter64 txInnerPackets(2)
| |       +-- r-n Counter64 txInnerOctets(3)
| |       +-- r-n Counter64 rxInnerPackets(4)
| |       +-- r-n Counter64 rxInnerOctets(5)
| |       +-- r-n Counter64 rxIncompleteInnerPackets(6)
| +--iptfsOuterStatsGroup(4)
| |   +--iptfsOuterStatsTable(1)
| |     +--iptfsOuterStatsTableEntry(1) [iptfsSaIndex]
| |       +-- --- Integer32 iptfsSaIndex(1)
| |       +-- r-n Counter64 txExtraPadPackets(2)
| |       +-- r-n Counter64 txExtraPadOctets(3)
| |       +-- r-n Counter64 txAllPadPackets(4)
| |       +-- r-n Counter64 txAllPadOctets(5)
| |       +-- r-n Counter64 rxExtraPadPackets(6)
| |       +-- r-n Counter64 rxExtraPadOctets(7)
| |       +-- r-n Counter64 rxAllPadPackets(8)
| |       +-- r-n Counter64 rxAllPadOctets(9)
| |       +-- r-n Counter64 rxErroredPackets(10)
| |       +-- r-n Counter64 rxMissedPackets(11)

```

```
+--iptfsMIBConformance(2)
  +--iptfsMIBConformances(1)
  |   +--iptfsMIBCompliance(1)
  +--iptfsMIBGroups(2)
    +--iptfsMIBConfGroup(1)
    +--ipsecStatsConfGroup(2)
    +--iptfsInnerStatsConfGroup(3)
    +--iptfsOuterStatsConfGroup(4)
```

[4.2.](#) SNMP

The following is the MIB for IP-TFS.

```
-- *-----
-- *
-- *-----
```

```
IETF-IPTFS-MIB DEFINITIONS ::= BEGIN
  IMPORTS
```

```
MODULE-IDENTITY, OBJECT-TYPE,
Integer32, Unsigned32, Counter64, experimental
  FROM SNMPv2-SMI
MODULE-COMPLIANCE, OBJECT-GROUP
  FROM SNMPv2-CONF
TEXTUAL-CONVENTION,
TruthValue
  FROM SNMPv2-TC;
```

```
iptfsMIB MODULE-IDENTITY
  LAST-UPDATED "202111110000Z"
  ORGANIZATION "IETF IPsecme Working Group"
  CONTACT-INFO
    "
      Author: Don Fedyk
      <mailto:dfedyk@labn.net>

      Author: Eric Kinzie
      <mailto:ekinzie.labn.net>"
```

DESCRIPTION

"This module defines the configuration and operational state for managing the IP Traffic Flow Security functionality [RFC XXXX]. Copyright (c) 2020 IETF Trust and the persons identified as authors of the code. All rights reserved.

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This version of this SNMP MIB module is part of RFC XXXX (<https://tools.ietf.org/html/rfcXXXX>); see the RFC itself for full legal notices."

REVISION "202111110000Z"

DESCRIPTION

"Initial revision. Derived from the IPTFS Yang Model."

::= { experimental 500 }

--

-- Textual Conventions

--

UnsignedShort ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION "xs:unsignedShort"

SYNTAX Unsigned32 (0 .. 65535)

NanoSeconds ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"Represents time unit value in nanoseconds."

SYNTAX Counter64

```

-- Objects, Notifications & Conformances

iptfsMIBObjects      OBJECT IDENTIFIER
                    ::= { iptfsMIB 1 }
iptfsMIBConformance OBJECT IDENTIFIER
                    ::= { iptfsMIB 2}

--
-- IPTFS MIB Object Groups
--
iptfsGroup OBJECT IDENTIFIER
           ::= { iptfsMIBObjects 1 }

ipsecStatsGroup OBJECT IDENTIFIER
                ::= { iptfsMIBObjects 2 }

iptfsInnerStatsGroup OBJECT IDENTIFIER
                    ::= { iptfsMIBObjects 3 }

iptfsOuterStatsGroup OBJECT IDENTIFIER
                    ::= { iptfsMIBObjects 4 }

iptfsConfigTable OBJECT-TYPE
    SYNTAX      SEQUENCE OF IptfsConfigTableEntry
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "The table containing configuration information for
        IPTFS."
    ::= { iptfsGroup 1 }

iptfsConfigTableEntry OBJECT-TYPE
    SYNTAX      IptfsConfigTableEntry

```

```

MAX-ACCESS not-accessible
STATUS      current
DESCRIPTION
    "An entry (conceptual row) containing the information on
    a particular IPTFS SA."
INDEX       { iptfsConfigSaIndex }
::= { iptfsConfigTable 1 }

```

```

IptfsConfigTableEntry ::= SEQUENCE {
    iptfsConfigSaIndex      Integer32,

    -- identifier information
    congestionControl       TruthValue,
    usePathMtu              TruthValue,
    outerPacketSize        UnsignedShort,
    l2FixedRate             Counter64,
    l3FixedRate             Counter64,
    dontFragment           TruthValue,
    maxAggregationTime     NanoSeconds,
    windowSize              Unsigned32,
    sendImmediately        TruthValue,
    lostPktTimerInt        NanoSeconds
}

```

iptfsConfigSaIndex OBJECT-TYPE

SYNTAX Integer32 (1..16777215)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A unique value, greater than zero, for each SA.
It is recommended that values are assigned contiguously starting from 1.

The value for each entry must remain constant at least from one re-initialization of entity's network management system to the next re-initialization."

::= { iptfsConfigTableEntry 1 }

congestionControl OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Congestion Control With the congestion controlled mode, IP-TFS adapts to network congestion by lowering the packet send rate to accommodate the congestion, as well as raising the rate when congestion subsides."

DEFVAL { false }

::= { iptfsConfigTableEntry 2 }

usePathMtu OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Packet size is either auto-discovered or manually configured. If usePathMtu is true the system utilizes path-mtu to determine maximum IPTFS packet size. If the packet size is explicitly configured then it will only be adjusted downward if use-path-mtu is set."

::= { iptfsConfigTableEntry 3 }

outerPacketSize OBJECT-TYPE

SYNTAX UnsignedShort

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The size of the outer encapsulating tunnel packet (i.e., the IP packet containing the ESP payload)."

::= { iptfsConfigTableEntry 4 }

l2FixedRate OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"TFS bit rate may be specified at layer 2 wire rate. Target bandwidth/bit rate in bps for iptfs tunnel. This rate is the nominal timing for the fixed size packet. If congestion control is enabled the rate may be adjusted down (or up if unset)."

::= { iptfsConfigTableEntry 5 }

l3FixedRate OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"TFS bit rate may be specified at layer 3 packet rate. Target bandwidth/bit rate in bps for iptfs tunnel. this rate is the nominal timing for the fixed size packet. If congestion control is enabled the rate may be adjusted down (or up if unset)."

::= { iptfsConfigTableEntry 6 }

dontFragment OBJECT-TYPE

```
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Disable packet fragmentation across consecutive iptfs
  tunnel packets when set to true."
 ::= { iptfsConfigTableEntry 7 }
```

maxAggregationTime OBJECT-TYPE

```
SYNTAX      NanoSeconds
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Maximum aggregation time is the maximum length of
  time a received inner packet can be held prior to
  transmission in the iptfs tunnel. Inner packets that
  would be held longer than this time, based on the
  current tunnel configuration will be dropped rather
  than be queued for transmission."
 ::= { iptfsConfigTableEntry 8 }
```

windowSize OBJECT-TYPE

```
SYNTAX      Unsigned32(0..65535)
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "The maximum number of out-of-order packets that will be
  reordered by an iptfs receiver while performing the
  reordering operation. The value 0 disables any
  reordering."
 ::= { iptfsConfigTableEntry 9 }
```

sendImmediately OBJECT-TYPE

```
SYNTAX      TruthValue
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Send inner packets as soon as possible, do not wait for
  lost or misordered outer packets. Selecting this option
  reduces the inner (user) packet delay but can amplify
  out-of-order delivery of the inner packet stream in the
  presence of packet aggregation and any reordering."
 ::= { iptfsConfigTableEntry 10 }
```

lostPktTimerInt OBJECT-TYPE

```
SYNTAX      NanoSeconds
```

MAX-ACCESS read-only
STATUS current

DESCRIPTION

"This interval defines the length of time an iptfs receiver will wait for a missing packet before considering it lost. Setting this value too low can impact reordering and reassembly. The value is configurable in milliseconds or fractional milliseconds down to 1 nanosecond."

::= { iptfsConfigTableEntry 11 }

ipsecStatsTable OBJECT-TYPE

SYNTAX SEQUENCE OF IpsecStatsTableEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"The table containing basic statistics on IPsec."

::= { ipsecStatsGroup 1 }

ipsecStatsTableEntry OBJECT-TYPE

SYNTAX IpsecStatsTableEntry

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"An entry (conceptual row) containing the information on a particular IKE SA."

INDEX { ipsecSaIndex }

::= { ipsecStatsTable 1 }

```
IpsecStatsTableEntry ::= SEQUENCE {
  ipsecSaIndex          Integer32,
  -- packet statistics information
  txPackets             Counter64,
  txOctets              Counter64,
  txDropPackets        Counter64,
  rxPackets             Counter64,
  rxOctets              Counter64,
  rxDropPackets        Counter64
}
```

ipsecSaIndex OBJECT-TYPE

SYNTAX Integer32 (1..16777215)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A unique value, greater than zero, for each SA.

It is recommended that values are assigned contiguously starting from 1.

The value for each entry must remain constant at least from one re-initialization of entity's network management system to the next re-initialization."

::= { ipsecStatsTableEntry 1 }

txPackets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Outbound Packet count."

::= { ipsecStatsTableEntry 2 }

txOctets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Outbound Packet bytes."

::= { ipsecStatsTableEntry 3 }

txDropPackets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Outbound dropped packets count."

::= { ipsecStatsTableEntry 4 }

rxPackets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Inbound Packet count."
::= { ipsecStatsTableEntry 5 }

rxOctets OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Inbound Packet bytes."
::= { ipsecStatsTableEntry 6 }

rxDropPackets OBJECT-TYPE
SYNTAX Counter64

MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Inbound Dropped packets"
::= { ipsecStatsTableEntry 7 }

iptfsInnerStatsTable OBJECT-TYPE
SYNTAX SEQUENCE OF IptfsInnerSaEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table containing information on IPTFS
Inner Packets."
::= { iptfsInnerStatsGroup 1 }

iptfsInnerStatsTableEntry OBJECT-TYPE
SYNTAX IptfsInnerSaEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"An entry containing the information on
a particular tfs SA."
INDEX { iptfsInnerSaIndex }
::= { iptfsInnerStatsTable 1 }

```
IptfsInnerSaEntry ::= SEQUENCE {
    iptfsInnerSaIndex      Integer32,

    txInnerPackets         Counter64,
    txInnerOoctets         Counter64,
    rxInnerPackets         Counter64,
    rxInnerOoctets         Counter64,
    rxIncompleteInnerPackets Counter64
}
```

iptfsInnerSaIndex OBJECT-TYPE

SYNTAX Integer32 (1..16777215)

MAX-ACCESS not-accessible

STATUS current

DESCRIPTION

"A unique value, greater than zero, for each SA.

It is recommended that values are assigned contiguously starting from 1.

The value for each entry must remain constant at least from one re-initialization of entity's network management system to the next re-initialization."

::= { iptfsInnerStatsTableEntry 1 }

txInnerPackets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total number of IP-TFS inner packets sent. This count is whole packets only. A fragmented packet counts as one packet."

::= { iptfsInnerStatsTableEntry 2 }

txInnerOoctets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total number of IP-TFS inner octets sent. This is inner packet octets only. Does not count padding."

::= { iptfsInnerStatsTableEntry 3 }

rxInnerPackets OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of IP-TFS inner packets received."
::= { iptfsInnerStatsTableEntry 4 }

rxInnerOctets OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of IP-TFS inner octets received. Does not include padding or overhead."
::= { iptfsInnerStatsTableEntry 5 }

rxIncompleteInnerPackets OBJECT-TYPE
SYNTAX Counter64
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Total number of IP-TFS inner packets that were incomplete. Usually this is due to fragments not received. Also, this may be due to misordering or errors in received outer packets."
::= { iptfsInnerStatsTableEntry 6 }

iptfsOuterStatsTable OBJECT-TYPE

SYNTAX SEQUENCE OF IptfsOuterSaEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The table containing information on IPTFS."
::= { iptfsOuterStatsGroup 1 }

iptfsOuterStatsTableEntry OBJECT-TYPE
SYNTAX IptfsOuterSaEntry
MAX-ACCESS not-accessible
STATUS current

```

DESCRIPTION
    "An entry containing the information on
    a particular tfs SA."
INDEX      { iptfsSaIndex }
 ::= { iptfsOuterStatsTable 1 }

IptfsOuterSaEntry ::= SEQUENCE {
    iptfsSaIndex          Integer32,

-- iptfs packet statistics information
    txExtraPadPackets    Counter64,
    txExtraPadOctets     Counter64,
    txAllPadPackets      Counter64,
    txAllPadOctets       Counter64,
    rxExtraPadPackets    Counter64,
    rxExtraPadOctets     Counter64,
    rxAllPadPackets      Counter64,
    rxAllPadOctets       Counter64,
    rxErroredPackets     Counter64,
    rxMissedPackets      Counter64
}

iptfsSaIndex OBJECT-TYPE
    SYNTAX      Integer32 (1..16777215)
    MAX-ACCESS  not-accessible
    STATUS      current
    DESCRIPTION
        "A unique value, greater than zero, for each SA.
        It is recommended that values are assigned contiguously
        starting from 1.

        The value for each entry must remain constant at least
        from one re-initialization of entity's network management
        system to the next re-initialization."
    ::= { iptfsOuterStatsTableEntry 1 }

```

```

txExtraPadPackets OBJECT-TYPE
    SYNTAX      Counter64
    MAX-ACCESS  read-only
    STATUS      current

```


DESCRIPTION

"Total number of transmitted outer IP-TFS packets that included some padding."

::= { iptfsOuterStatsTableEntry 2 }

txExtraPadOctets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total number of transmitted octets of padding added to outer IP-TFS packets with data."

::= { iptfsOuterStatsTableEntry 3 }

txAllPadPackets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total number of transmitted IP-TFS packets that were all padding with no inner packet data."

::= { iptfsOuterStatsTableEntry 4 }

txAllPadOctets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total number transmitted octets of padding added to IP-TFS packets with no inner packet data."

::= { iptfsOuterStatsTableEntry 5 }

rxExtraPadPackets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Total number of received outer IP-TFS packets that included some padding."

::= { iptfsOuterStatsTableEntry 6 }

rxExtraPadOctets OBJECT-TYPE

SYNTAX Counter64

MAX-ACCESS read-only

```
STATUS      current
DESCRIPTION
  "Total number of received octets of padding added to
  outer IP-TFS packets with data."
 ::= { iptfsOuterStatsTableEntry 7 }
```

```
rxAllPadPackets OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Total number of received IP-TFS packets that were all
  padding with no inner packet data."
 ::= { iptfsOuterStatsTableEntry 8 }
```

```
rxAllPadOctets OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Total number received octets of padding added to
  IP-TFS packets with no inner packet data."
 ::= { iptfsOuterStatsTableEntry 9 }
```

```
rxErroredPackets OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Total number of IP-TFS outer packets dropped due to
  errors."
 ::= { iptfsOuterStatsTableEntry 10 }
```

```
rxMissedPackets OBJECT-TYPE
SYNTAX      Counter64
MAX-ACCESS  read-only
STATUS      current
DESCRIPTION
  "Total number of IP-TFS outer packets missing indicated
  by missing sequence number."
 ::= { iptfsOuterStatsTableEntry 11 }
```

```
--
-- Iptfs Module Compliance
--
```

```
iptfsMIBConformances OBJECT IDENTIFIER
```

```
 ::= { iptfsMIBConformance 1 }
```

```
iptfsMIBGroups OBJECT IDENTIFIER
    ::= { iptfsMIBConformance 2 }

iptfsMIBCompliance MODULE-COMPLIANCE
    STATUS current
    DESCRIPTION
        "The compliance statement for entities which implement
        the IPTFS MIB"
    MODULE -- this module
        MANDATORY-GROUPS {
            iptfsMIBConfGroup,
            ipsecStatsConfGroup,
            iptfsInnerStatsConfGroup,
            iptfsOuterStatsConfGroup
        }

    ::= { iptfsMIBConformances 1 }

--
-- MIB Groups (Units of Conformance)
--

iptfsMIBConfGroup OBJECT-GROUP
    OBJECTS {
        congestionControl,
        usePathMtu,
        outerPacketSize ,
        l2FixedRate ,
        l3FixedRate ,
        dontFragment,
        maxAggregationTime,
        windowSize,
        sendImmediately,
        lostPktTimerInt
    }
    STATUS current
    DESCRIPTION
        "A collection of objects providing per SA IPTFS
        Configuration."
    ::= { iptfsMIBGroups 1 }
```

```
ipsecStatsConfGroup OBJECT-GROUP
  OBJECTS {
    txPackets,
    txOctets,
    txDropPackets,
    rxPackets,
    rxOctets,
```

```
    rxDropPackets
  }
  STATUS current
  DESCRIPTION
    "A collection of objects providing per SA Basic
    Stats."
  ::= { iptfsMIBGroups 2 }
```

```
iptfsInnerStatsConfGroup OBJECT-GROUP
  OBJECTS {
    txInnerPackets,
    txInnerOctets,
    rxInnerPackets,
    rxInnerOctets,
    rxIncompleteInnerPackets
  }
  STATUS current
  DESCRIPTION
    "A collection of objects providing per SA IPTFS
    Inner Packet Statistics."
  ::= { iptfsMIBGroups 3 }
```

```
iptfsOuterStatsConfGroup OBJECT-GROUP
  OBJECTS {
    txExtraPadPackets,
    txExtraPadOctets,
    txAllPadPackets,
    txAllPadOctets,
    rxExtraPadPackets,
    rxExtraPadOctets,
    rxAllPadPackets,
    rxAllPadOctets,
```

```
        rxErroredPackets,
        rxMissedPackets
    }
    STATUS current
    DESCRIPTION
        "A collection of objects providing per SA IPTFS
        Outer Packet Statistics."
    ::= { iptfsMIBGroups 4 }
```

END

[5.](#) Security Considerations

The MIB specified in this document can read the operational and configured the behavior of IP traffic flow security, for the implications regarding write configuration consult the [\[I-D.ietf-ipsecme-iptfs\]](#) which defines the functionality.

[6.](#) Acknowledgements

The authors would like to thank Chris Hopps for his help and feedback on the MIB model.

[7.](#) Normative References

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Authors' Addresses

Don Fedyk
LabN Consulting, L.L.C.

Email: dfedyk@labn.net

Eric Kinzie
LabN Consulting, L.L.C.

Email: ekinzie@labn.net