Network Working Group D. Fedyk
Internet-Draft E. Kinzie
Intended status: Standards Track LabN Consulting, L.L.C.
Expires: November 22, 2021 May 21, 2021

Definitions of Managed Objects for IP Traffic Flow Security
draft-ietf-ipsecme-mib-iptfs-00

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This is an unpublished work in progress.

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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This Internet-Draft will expire on November 22, 2021.

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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.draft-fedyk-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.draft-fedyk-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.draft-fedyk-ipsecme-yang-iptfs].

This document specifies an extensible operational model for IP-TFS. It reuses the management model defined in [I-D.draft-fedyk-ipsecme-yang-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 0.5.0)

---- iptfsMIB(1.3.6.1.3.500)
  +---- iptfsMIBObjects(1)
  |  +---- iptfsGroup(1)
  |  |  +---- iptfsConfigTable(1)
  |  |     +---- iptfsConfigTableEntry(1) [iptfsConfigSaIndex]
  |  |        +---- iptfsConfigSaIndex(1) Integer32
  |  |        +--r- congestionControl(2)  TruthValue
  |  |        +--r- usePathMtu(3)         TruthValue
  |  |        +--r- outerPacketSize(4)    UnsignedShort
  |  |        +--r- l2FixedRate(5)        Counter64
  |  |        +--r- l3FixedRate(6)        Counter64
  |  |        +--r- dontFragment(7)       TruthValue
  |  |        +--r- maxAggregationTime(8) NanoSeconds
```

```
   |  +---- ipsecStatsGroup(2)
   |  |  +---- ipsecStatsTable(1)
   |  |     +---- ipsecStatsTableEntry(1) [ipsecSaIndex]
   |  |        +---- ipsecSaIndex(1)  Integer32
   |  |        +--r- txPackets(2)     Counter64
   |  |        +--r- txOctets(3)      Counter64
   |  |        +--r- txDropPackets(4) Counter64
   |  |        +--r- rxPackets(5)     Counter64
   |  |        +--r- rxOctets(6)      Counter64
   |  |        +--r- rxDropPackets(7) Counter64
   |  +---- iptfsInnerStatsGroup(3)
   |  |  +---- iptfsInnerStatsTable(1)
   |  |     +---- iptfsInnerStatsTableEntry(1) [iptfsInnerSaIndex]
   |  |        +---- iptfsInnerSaIndex(1)        Integer32
   |  |        +--r- txInnerPackets(2)           Counter64
   |  |        +--r- txInnerOctets(3)            Counter64
   |  |        +--r- rxInnerPackets(4)           Counter64
   |  |        +--r- rxInnerOctets(5)            Counter64
   |  |        +--r- rxIncompleteInnerPackets(6) Counter64
   |  +---- iptfsOuterStatsGroup(4)
   |     +---- iptfsOuterStatsTable(1)
   |        +---- iptfsOuterStatsTableEntry(1) [iptfsSaIndex]
   |           +---- iptfsSaIndex(1)      Integer32
   |           +--r- txExtraPadPackets(2) Counter64
   |           +--r- txExtraPadOctets(3)  Counter64
   |           +--r- txAllPadPackets(4)   Counter64
   |           +--r- txAllPadOctets(5)    Counter64
   |           +--r- rxExtraPadPackets(6) Counter64
   |           +--r- rxExtraPadOctets(7)  Counter64
   |           +--r- rxAllPadPackets(8)   Counter64
   |           +--r- rxAllPadOctets(9)    Counter64
   |           +--r- rxErroredPackets(10) Counter64
   |           +--r- rxMissedPackets(11)  Counter64
   +---- 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 "202011130000Z"
        ORGANIZATION "IETF IPsecme Working Group"
        CONTACT-INFO
                "
                   Author: Don Fedyk
                           <mailto:dfedyk@labn.net>

                   Author: Christian Hopps
                           <mailto:chopps@chopps.org>"


   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.

      Redistribution and use in source and binary forms,
      with or without modification, is permitted pursuant
      to, and subject to the license terms contained in,
      the Simplified BSD License set forth in Section 4.c
      of the IETF Trust's Legal Provisions Relating to IETF
      Documents (https://trustee.ietf.org/license-info).

      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 "202011130000Z"
    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
     }

     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 in nanoseconds."
         ::= { iptfsConfigTableEntry 8 }

    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,
      txInnerOctets              Counter64,
      rxInnerPackets             Counter64,
      rxInnerOctets              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 }

    txInnerOctets 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 paccket 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
          }
          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 enable, disable and modify the behavior of IP traffic flow security, for the implications regarding these types of changes consult the [I-D.ietf-ipsecme-iptfs] which defines the functionality.

6. Acknowledgements

The authors would like to thank Eric Kinzie 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