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**Definitions of Managed Objects  
For iFCP**

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## Abstract

This memo defines a portion of the Management Information Base (MIB) for use with network management protocols in the Internet community. In particular, it defines a basic set of managed objects for SNMP-based monitoring and management of an Internet Storage Name Service (iSNS).

This memo specifies a MIB module in a manner that is compliant to the SMIV2. The set of objects is consistent with the SNMP framework and existing SNMP standards.

This memo is a product of the IP Storage (IPS) working group within the Internet Engineering Task Force. Comments are solicited and should be addressed to the working group's mailing list at [ips@ece.cmu.edu](mailto:ips@ece.cmu.edu) and/or the authors.

## **1. Introduction**

The iSNS Internet Storage Name Service defines a mechanism for IP based storage devices to register and query for other storage devices in the network. This draft specifies the MIB objects for

managing iSNS servers.

## **2. The SNMP Management Framework**

The SNMP Management Framework presently consists of five major components:

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- o An overall architecture, described in [RFC 2571](#) [[RFC2571](#)].
- o Mechanisms for describing and naming objects and events for the purpose of management. The first version of this Structure of Management Information (SMI) is called SMIV1 and described in STD 16, [RFC 1155](#) [[RFC1155](#)], STD 16, [RFC 1212](#) [[RFC1212](#)] and [RFC 1215](#) [[RFC1215](#)]. The second version, called SMIV2, is described in STD 58, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].
- o Message protocols for transferring management information. The first version of the SNMP message protocol is called SNMPv1 and described in STD 15, [RFC 1157](#) [[RFC1157](#)]. A second version of the SNMP message protocol, which is not an Internet standards track protocol, is called SNMPv2c and described in [RFC 1901](#) [[RFC1901](#)] and [RFC 1906](#) [[RFC1906](#)]. The third version of the message protocol is called SNMPv3 and described in [RFC 1906](#) [[RFC1906](#)], [RFC 2572](#) [[RFC2572](#)] and [RFC 2574](#) [[RFC2574](#)].
- o Protocol operations for accessing management information. The first set of protocol operations and associated PDU formats is described in STD 15, [RFC 1157](#) [[RFC1157](#)]. A second set of protocol operations and associated PDU formats is described in [RFC 1905](#) [[RFC1905](#)].
- o A set of fundamental applications described in [RFC 2573](#) [[RFC2573](#)] and the view-based access control mechanism described in [RFC 2575](#) [[RFC2575](#)].

A more detailed introduction to the current SNMP Management Framework can be found in [RFC 2570](#) [[RFC2570](#)].

Managed objects are accessed via a virtual information store, termed the Management Information Base or MIB. Objects in the MIB are defined using the mechanisms defined in the SMI.

This memo specifies a MIB module that is compliant to the SMIV2. A MIB conforming to the SMIV1 can be produced through the appropriate translations. The resulting translated MIB must be

semantically equivalent, except where objects or events are omitted because no translation is possible (use of Counter64). Some machine readable information in SMIV2 will be converted into textual descriptions in SMIV1 during the translation process. However, this loss of machine readable information is not considered to change the semantics of the MIB.

### **3. Overview**

The iFCP protocol can be used by IP based storage devices for FCP compatible storage. The iFCP MIB is designed to allow SNMP to be used to monitor and manage an iFCP gateway.

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### **4. Technical Description**

The MIB is divided into several sections for gateway information, entity, portal and node information, and session information.

### **5. MIB Definition**

```
IFCP-MIB DEFINITIONS ::= BEGIN
--
--  iFCP.mib: IETF iFCP internet Fibre Channel Protocol
--  management information base, v1.0
--
IMPORTS
    MODULE-IDENTITY,
    OBJECT-TYPE,
    IpAddress,
    Unsigned32,
    Counter32,
    Counter64,
    experimental
        FROM SNMPv2-SMI

    OBJECT-GROUP,
    MODULE-COMPLIANCE
        FROM SNMPv2-CONF

    DateAndTime,
    RowStatus
        FROM SNMPv2-TC

--  These are from rfc 2851
    InetAddressType,
    InetAddress
        FROM INET-ADDRESS-MIB
```

;

ifcpModule MODULE-IDENTITY  
LAST-UPDATED "200107200000Z"  
ORGANIZATION "IETF IPS Working Group"  
CONTACT-INFO "  
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"

DESCRIPTION "The MIB for internet Fibre Channel Protocol  
(iFCP) management."  
::= {experimental 4370}

FCIDtype ::= OCTET STRING (SIZE (3))  
WWNtype ::= OCTET STRING (SIZE (8))  
EntIdx ::= INTEGER (1..4294967295)  
PortalIdx ::= INTEGER (1..4294967295)  
NodeIdx ::= INTEGER (1..4294967295)  
EidType ::= OCTET STRING  
NodeTypeBitmap ::= OCTET STRING (SIZE (4))  
ScnBitmap ::= OCTET STRING (SIZE (4))  
EntType ::= INTEGER {iSCSI(1), iFCP(2)}  
IscsiNameType ::= OCTET STRING  
DDIDtype ::= INTEGER (1..4294967295)

```

ClockType      ::= INTEGER (0..4294967295)
VersionType    ::= INTEGER (0..4294967295)
PortGrpType    ::= INTEGER (0..4294967295)
PortType       ::= INTEGER (0..131071)
EsiIntType     ::= INTEGER (0..4294967295)
TfType        ::= INTEGER {true(1), false(2)}

--
-- Internet Fibre Channel Protocol (iFCP)
--

ifcpGatewayObj      OBJECT IDENTIFIER ::= { ifcpModule 1 }
ifcpGatewayConformance OBJECT IDENTIFIER ::= { ifcpModule 2 }

--
-- ifcp Objects -----
--

ifcpGatewayObjInfo  OBJECT IDENTIFIER ::= { ifcpGatewayObj 1}

--      top-level object information here

ifcpGatewayVendorID      OBJECT-TYPE
    SYNTAX                OCTET STRING (SIZE (0 .. 256))
    MAX-ACCESS             read-write
    STATUS                 current
    DESCRIPTION
        "The vendor identification of this ifcp gateway instance."

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    ::= {ifcpGatewayObjInfo 1}

ifcpGatewayVendorVersion OBJECT-TYPE
    SYNTAX                OCTET STRING (SIZE (0 .. 256))
    MAX-ACCESS             read-write
    STATUS                 current
    DESCRIPTION
        "The vendor version of this ifcp gateway instance."
    ::= {ifcpGatewayObjInfo 2}

ifcpGatewayMgtAddrType  OBJECT-TYPE
    SYNTAX                InetAddressType
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
        "The type of Inet address in the next object."
    ::= {ifcpGatewayObjInfo 3}

ifcpGatewayMgtAddr      OBJECT-TYPE

```

|             |             |
|-------------|-------------|
| SYNTAX      | InetAddress |
| MAX-ACCESS  | read-only   |
| STATUS      | current     |
| DESCRIPTION |             |

"The Inet management address of the ifcp instance. This is the in-band Inet Address that is used for SNMP."  
::= {ifcpGatewayObjInfo 4}

|                                |                 |
|--------------------------------|-----------------|
| ifcpGatewayIsnsPrimaryAddrType | OBJECT-TYPE     |
| SYNTAX                         | InetAddressType |
| MAX-ACCESS                     | read-only       |
| STATUS                         | current         |
| DESCRIPTION                    |                 |

"The type of Inet address in the next object."  
::= {ifcpGatewayObjInfo 5}

|                            |             |
|----------------------------|-------------|
| ifcpGatewayIsnsPrimaryAddr | OBJECT-TYPE |
| SYNTAX                     | InetAddress |
| MAX-ACCESS                 | read-only   |
| STATUS                     | current     |
| DESCRIPTION                |             |

"The in-band Inet address of the primary ifcp instance in the network. This is the in-band Inet Address that is used for ifcpP messages."  
::= {ifcpGatewayObjInfo 6}

|                     |                    |
|---------------------|--------------------|
| ifcpGatewayIsnsPort | OBJECT-TYPE        |
| SYNTAX              | INTEGER (0..65535) |
| MAX-ACCESS          | read-only          |
| STATUS              | current            |
| DESCRIPTION         |                    |

"Indicates the UDP/TCP port that the ifcp gateway is currently using for iSNS communication."  
::= {ifcpGatewayObjInfo 7}

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|                         |             |
|-------------------------|-------------|
| ifcpGatewayIsnsMcastGrp | OBJECT-TYPE |
| SYNTAX                  | IpAddress   |
| MAX-ACCESS              | read-only   |
| STATUS                  | current     |
| DESCRIPTION             |             |

"The multicast group being used for iSNS communication. This group is only valid if multicast communication has been set."  
::= {ifcpGatewayObjInfo 8}

|                             |             |
|-----------------------------|-------------|
| ifcpGatewayIsnsMcastEnabled | OBJECT-TYPE |
|-----------------------------|-------------|

```

        SYNTAX                TFtype
        MAX-ACCESS             read-only
        STATUS                 current
        DESCRIPTION
        "If this is true the gateway is enabled to communicate
        with the iSNS using multicast."
        ::= {ifcpGatewayObjInfo 9}

ifcpNumEntities              OBJECT-TYPE
    SYNTAX                   EntIdx
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
    "The current total number of Entities in the gateway."
    ::= {ifcpGatewayObjInfo 10}

ifcpNumPortals              OBJECT-TYPE
    SYNTAX                   PortalIdx
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
    "The current total number of Portals in the gateway."
    ::= {ifcpGatewayObjInfo 11}

ifcpNumNodes                OBJECT-TYPE
    SYNTAX                   NodeIdx
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
    "The current total number of iFCP nodes in the gateway."
    ::= {ifcpGatewayObjInfo 12}

ifcpNumFcNodes              OBJECT-TYPE
    SYNTAX                   NodeIdx
    MAX-ACCESS               read-only
    STATUS                   current
    DESCRIPTION
    "The current total number of FC nodes in the gateway."
    ::= {ifcpGatewayObjInfo 13}

--
-- ifcp Gateway Entities
--

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ifcpGatewayEntityInfo      OBJECT IDENTIFIER ::= { ifcpGatewayObj 2}

--

```

```
-- ifcp Gateway Entities Table
--
```

```
ifcpGatewayEntityTable          OBJECT-TYPE
    SYNTAX                      SEQUENCE OF IfcpGatewayEntityEntry
    MAX-ACCESS                  not-accessible
    STATUS                      current
    DESCRIPTION
    "A table containing the entities in the Gateway ."
    ::= {ifcpGatewayEntityInfo 1}
```

```
ifcpGatewayEntityEntry          OBJECT-TYPE
    SYNTAX                      IfcpGatewayEntityEntry
    MAX-ACCESS                  not-accessible
    STATUS                      current
    DESCRIPTION
    "Information on Gateway entities in the ifcp."
    INDEX {ifcpGatewayEntityEIdx}
    ::= {ifcpGatewayEntityTable 1}
```

```
IfcpGatewayEntityEntry ::=
    SEQUENCE {
        ifcpGatewayEntityEIdx      EntIdx,
        ifcpGatewayEntityEID      EidType,
        ifcpGatewayEntityVersionRange VersionType
    }
```

```
ifcpGatewayEntityEIdx          OBJECT-TYPE
    SYNTAX                      EntIdx
    MAX-ACCESS                  read-only
    STATUS                      current
    DESCRIPTION
    "The Entity Index for this entity. The index is
    derived for mapping between objects."
    ::= {ifcpGatewayEntityEntry 1}
```

```
ifcpGatewayEntityEID          OBJECT-TYPE
    SYNTAX                      EidType
    MAX-ACCESS                  read-only
    STATUS                      current
    DESCRIPTION
    "The Entity Identifier for this entity as defined in
    the ifcp Specification."
    ::= {ifcpGatewayEntityEntry 2}
```

```
ifcpGatewayEntityVersionRange  OBJECT-TYPE
    SYNTAX                      VersionType
    MAX-ACCESS                  read-only
    STATUS                      current
    DESCRIPTION
```

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"The Protocol Version minimum and maximum as defined  
in the ifcp Specification."

::= {ifcpGatewayEntityEntry 3}

--

-- ifcp Gateway Portal Information

--

ifcpGatewayPortalInfo      OBJECT IDENTIFIER ::= { ifcpGatewayObj 3}

--

-- ifcp Gateway Portal Table

--

ifcpGatewayPortalTable      OBJECT-TYPE

    SYNTAX                  SEQUENCE OF IfcpGatewayPortalEntry

    MAX-ACCESS              not-accessible

    STATUS                  current

    DESCRIPTION

"A table containing the Gateway portals in the ifcp."

    ::= {ifcpGatewayPortalInfo 1}

ifcpGatewayPortalEntry      OBJECT-TYPE

    SYNTAX                  IfcpGatewayPortalEntry

    MAX-ACCESS              not-accessible

    STATUS                  current

    DESCRIPTION

"Information on Gateway entity portals in the ifcp."

    INDEX      {ifcpGatewayPortalPrtlIdx, ifcpGatewayPortalEIdx}

    ::= {ifcpGatewayPortalTable 1}

IfcpGatewayPortalEntry ::=

    SEQUENCE {

|                                |                  |
|--------------------------------|------------------|
| ifcpGatewayPortalPrtlIdx       | PortalIdx,       |
| ifcpGatewayPortalEIdx          | EntIdx,          |
| ifcpGatewayPortalAddrType      | InetAddressType, |
| ifcpGatewayPortalAddr          | InetAddress,     |
| ifcpGatewayPortalPort          | PortType,        |
| ifcpGatewayPortalSymName       | OCTET STRING,    |
| ifcpGatewayPortalEsiInterval   | EsiIntType,      |
| ifcpGatewayPortalEsiScnUdpPort | PortType,        |
| ifcpGatewayPortalGroup         | PortGrpType,     |
| ifcpGatewayPortalUptime        | ClockType        |
| }                              |                  |

ifcpGatewayPortalPrtlIdx      OBJECT-TYPE

    SYNTAX                  PortalIdx

|                                                                                     |           |
|-------------------------------------------------------------------------------------|-----------|
| MAX-ACCESS                                                                          | read-only |
| STATUS                                                                              | current   |
| DESCRIPTION                                                                         |           |
| "The Portal Index for this node. The index is derived for mapping between objects." |           |
| ::= {ifcpGatewayPortalEntry 1}                                                      |           |

|                |                       |             |
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|                                                                                                                 |             |
|-----------------------------------------------------------------------------------------------------------------|-------------|
| ifcpGatewayPortalEIdx                                                                                           | OBJECT-TYPE |
| SYNTAX                                                                                                          | EntIdx      |
| MAX-ACCESS                                                                                                      | read-only   |
| STATUS                                                                                                          | current     |
| DESCRIPTION                                                                                                     |             |
| "The Entity Index of the entity associated with this portal. The index is derived for mapping between objects." |             |
| ::= {ifcpGatewayPortalEntry 2}                                                                                  |             |

|                                                |                 |
|------------------------------------------------|-----------------|
| ifcpGatewayPortalAddrType                      | OBJECT-TYPE     |
| SYNTAX                                         | InetAddressType |
| MAX-ACCESS                                     | read-only       |
| STATUS                                         | current         |
| DESCRIPTION                                    |                 |
| "The type of Inet address in the next object." |                 |
| ::= {ifcpGatewayPortalEntry 3 }                |                 |

|                                                                          |             |
|--------------------------------------------------------------------------|-------------|
| ifcpGatewayPortalAddr                                                    | OBJECT-TYPE |
| SYNTAX                                                                   | InetAddress |
| MAX-ACCESS                                                               | read-only   |
| STATUS                                                                   | current     |
| DESCRIPTION                                                              |             |
| "The Inet Address for this portal as defined in the ifcp Specification." |             |
| ::= {ifcpGatewayPortalEntry 4}                                           |             |

|                                                                          |             |
|--------------------------------------------------------------------------|-------------|
| ifcpGatewayPortalPort                                                    | OBJECT-TYPE |
| SYNTAX                                                                   | PortType    |
| MAX-ACCESS                                                               | read-only   |
| STATUS                                                                   | current     |
| DESCRIPTION                                                              |             |
| "The TCP/UDP port for this portal as defined in the ifcp Specification." |             |
| ::= {ifcpGatewayPortalEntry 5}                                           |             |

|                          |                            |
|--------------------------|----------------------------|
| ifcpGatewayPortalSymName | OBJECT-TYPE                |
| SYNTAX                   | OCTET STRING(SIZE(0..256)) |
| MAX-ACCESS               | read-only                  |
| STATUS                   | current                    |

```

        DESCRIPTION
    "The Symbolic Name for this portal as defined in the ifcp
    Specification."
        ::= {ifcpGatewayPortalEntry 6}

ifcpGatewayPortalEsiInterval      OBJECT-TYPE
    SYNTAX          EsiIntType
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
    "The ESI Interval for this portal as defined in the ifcp
    Specification."
        ::= {ifcpGatewayPortalEntry 7}

ifcpGatewayPortalEsiScnUdpPort   OBJECT-TYPE

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    SYNTAX          PortType
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
    "The ESI/SCN UDP port for this portal as defined in the ifcp
    Specification."
        ::= {ifcpGatewayPortalEntry 8}

ifcpGatewayPortalGroup           OBJECT-TYPE
    SYNTAX          PortGrpType
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
    "The Portal Group for this portal as defined in the ifcp
    Specification."
        ::= {ifcpGatewayPortalEntry 9}

ifcpGatewayPortalUptime          OBJECT-TYPE
    SYNTAX          ClockType
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
    "The uptime, in seconds, for this portal."
        ::= {ifcpGatewayPortalEntry 10}

--
-- ifcp Gateway iFCP Node Information
--

ifcpGatewayNodeInfo             OBJECT IDENTIFIER ::= { ifcpGatewayObj 4}

--

```

-- ifcp Gateway iFCP Node Table

--

ifcpGatewayNodeTable      OBJECT-TYPE  
    SYNTAX                  SEQUENCE OF IfcpGatewayNodeEntry  
    MAX-ACCESS              not-accessible  
    STATUS                  current

DESCRIPTION

"Information on iFCP Nodes in the Gateway."

::= {ifcpGatewayNodeInfo 1}

ifcpGatewayNodeEntry OBJECT-TYPE  
    SYNTAX                  IfcpGatewayNodeEntry  
    MAX-ACCESS              not-accessible  
    STATUS                  current

DESCRIPTION

"Information on iFCP Node Entries in the Gateway ."

INDEX {ifcpGatewayNodeWwpn}

::= {ifcpGatewayNodeTable 1}

IfcpGatewayNodeEntry ::= SEQUENCE {  
    ifcpGatewayNodeWwpn                  WWNtype,

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|                              |                  |
|------------------------------|------------------|
| ifcpGatewayNodeEidx          | EntIdx,          |
| ifcpGatewayNodePortID        | FCIDtype,        |
| ifcpGatewayNodePortType      | INTEGER,         |
| ifcpGatewayNodeSymName       | OCTET STRING,    |
| ifcpGatewayNodeFcNodeWwn     | WWNtype,         |
| ifcpGatewayNodeFabricPortWwn | WWNtype,         |
| ifcpGatewayNodeHA            | FCIDtype,        |
| ifcpGatewayNodePortAddrType  | InetAddressType, |
| ifcpGatewayNodePortAddr      | InetAddress,     |
| ifcpGatewayNodeFcCos         | INTEGER,         |
| ifcpGatewayNodeFc4Types      | OCTET STRING,    |
| ifcpGatewayNodeFc4Descr      | OCTET STRING,    |
| ifcpGatewayNodeFc4Features   | OCTET STRING,    |
| ifcpGatewayNodeScnBitmap     | ScnBitmap        |
|                              | }                |

ifcpGatewayNodeWwpn                  OBJECT-TYPE  
    SYNTAX                  WWNtype  
    MAX-ACCESS              read-only  
    STATUS                  current

DESCRIPTION

"The iFCP Node World Wide Port Name as defined in the ifcp Specification."

::= {ifcpGatewayNodeEntry 1}

```

ifcpGatewayNodeEidx          OBJECT-TYPE
    SYNTAX                    EntIdx
    MAX-ACCESS                 read-only
    STATUS                     current
    DESCRIPTION
        "The Entity Index of the Entity associated with this node.  The
        index is derived for mapping between objects."
        ::= {ifcpGatewayNodeEntry 2}

```

```

ifcpGatewayNodePortID        OBJECT-TYPE
    SYNTAX                    FCIDtype
    MAX-ACCESS                 read-only
    STATUS                     current
    DESCRIPTION
        "The iFCP Node Port ID as defined in the ifcp Specification."
        ::= {ifcpGatewayNodeEntry 3}

```

```

ifcpGatewayNodePortType      OBJECT-TYPE
    SYNTAX                    INTEGER {
        unknown              (0),
        nPort                (1),
        nIPort               (2),
        fNIPort              (3),
        fPort                (129),    -- x'81'
        fIPort               (130),    -- x'82'
        ePort                (132),    -- x'84'
        bPort                (133),    -- x'85'
        mFcpPort             (65297),  -- x'FF11'
        iFcpPort             (65298),  -- x'FF12'
    }

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```

        unknownEnd          (65535)
    }
    MAX-ACCESS                 read-only
    STATUS                     current
    DESCRIPTION
        "The iFCP Node Port Type as defined in the ifcp Specification."
        ::= {ifcpGatewayNodeEntry 4}

```

```

ifcpGatewayNodeSymName       OBJECT-TYPE
    SYNTAX                    OCTET STRING(SIZE(0..256))
    MAX-ACCESS                 read-only
    STATUS                     current
    DESCRIPTION
        "The iFCP Node Port Symbolic Name as defined in the ifcp
        Specification."
        ::= {ifcpGatewayNodeEntry 5}

```

|                                                                                        |             |
|----------------------------------------------------------------------------------------|-------------|
| ifcpGatewayNodeFcNodeWwn                                                               | OBJECT-TYPE |
| SYNTAX                                                                                 | WwnType     |
| MAX-ACCESS                                                                             | read-only   |
| STATUS                                                                                 | current     |
| DESCRIPTION                                                                            |             |
| "The FC Node Wwn associated with this iFCP Node as defined in the ifcp Specification." |             |
| ::= {ifcpGatewayNodeEntry 6}                                                           |             |

|                                                                                       |             |
|---------------------------------------------------------------------------------------|-------------|
| ifcpGatewayNodeFabricPortWwn                                                          | OBJECT-TYPE |
| SYNTAX                                                                                | WwnType     |
| MAX-ACCESS                                                                            | read-only   |
| STATUS                                                                                | current     |
| DESCRIPTION                                                                           |             |
| "The Fabric Port Wwn associated with this Port as defined in the ifcp Specification." |             |
| ::= {ifcpGatewayNodeEntry 7}                                                          |             |

|                                                             |             |
|-------------------------------------------------------------|-------------|
| ifcpGatewayNodeHA                                           | OBJECT-TYPE |
| SYNTAX                                                      | FCIDtype    |
| MAX-ACCESS                                                  | read-only   |
| STATUS                                                      | current     |
| DESCRIPTION                                                 |             |
| "The FC Hard Address as defined in the ifcp Specification." |             |
| ::= {ifcpGatewayNodeEntry 8}                                |             |

|                                                |                 |
|------------------------------------------------|-----------------|
| ifcpGatewayNodePortAddrType                    | OBJECT-TYPE     |
| SYNTAX                                         | InetAddressType |
| MAX-ACCESS                                     | read-only       |
| STATUS                                         | current         |
| DESCRIPTION                                    |                 |
| "The type of Inet address in the next object." |                 |
| ::= {ifcpGatewayNodeEntry 9 }                  |                 |

|                         |             |
|-------------------------|-------------|
| ifcpGatewayNodePortAddr | OBJECT-TYPE |
|-------------------------|-------------|

|       |                       |    |
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|                                                                         |             |
|-------------------------------------------------------------------------|-------------|
| SYNTAX                                                                  | InetAddress |
| MAX-ACCESS                                                              | read-only   |
| STATUS                                                                  | current     |
| DESCRIPTION                                                             |             |
| "The iFCP Node Port Inet Address as defined in the ifcp Specification." |             |
| ::= {ifcpGatewayNodeEntry 10}                                           |             |

```

ifcpGatewayNodeFcCos          OBJECT-TYPE
    SYNTAX                     INTEGER {
        --                      class-unknown (0),
                                classF (1),
                                class1 (2),
                                classF1 (3),
                                class2 (4),
                                classF2 (5),
                                class12 (6),
                                classF1_2 (7),
                                class3 (8),
                                classF3 (9),
                                class13 (10),
                                classF1_3 (11),
                                class23 (12),
                                classF2_3 (13),
                                class12_3 (14),
                                classF1_2_3 (15)
    }
    MAX-ACCESS                  read-only
    STATUS                      current
    DESCRIPTION
        "The iFCP Node Class of Service as defined in the ifcp
        Specification."
        ::= {ifcpGatewayNodeEntry 11}

ifcpGatewayNodeFc4Types       OBJECT-TYPE
    SYNTAX                     OCTET STRING (SIZE (32))
    MAX-ACCESS                  read-only
    STATUS                      current
    DESCRIPTION
        "The iFCP Node FC-4 Types as defined in the ifcp Specification."
        ::= {ifcpGatewayNodeEntry 12}

ifcpGatewayNodeFc4Descr      OBJECT-TYPE
    SYNTAX                     OCTET STRING(SIZE(0..256))
    MAX-ACCESS                  read-only
    STATUS                      current
    DESCRIPTION
        "The iFCP Node FC-4 Descriptors as defined in the ifcp
        Specification."
        ::= {ifcpGatewayNodeEntry 13}

ifcpGatewayNodeFc4Features    OBJECT-TYPE
    SYNTAX                     OCTET STRING (SIZE (128))
    MAX-ACCESS                  read-only

```

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```

        STATUS                current
        DESCRIPTION
        "The iFCP Node FC-4 Features as defined in the ifcp Specification."
        ::= {ifcpGatewayNodeEntry 14}

ifcpGatewayNodeScnBitmap    OBJECT-TYPE
    SYNTAX                  ScnBitmap
    MAX-ACCESS              read-only
    STATUS                  current
    DESCRIPTION
    "The iFCP Node SCN bitmap for this node as defined in the ifcp
    Specification."
    ::= {ifcpGatewayNodeEntry 15}

--
-- ifcp Gateway FC Node Information
--

ifcpGatewayFcNodeInfo      OBJECT IDENTIFIER ::= { ifcpGatewayObj 5}

--
-- ifcp Gateway FC Node Table
--

ifcpGatewayFcNodeTable     OBJECT-TYPE
    SYNTAX                  SEQUENCE OF IfcpGatewayFcNodeEntry
    MAX-ACCESS              not-accessible
    STATUS                  current
    DESCRIPTION
    "A table containing the FC Nodes in the Gateway."
    ::= {ifcpGatewayFcNodeInfo 1}

ifcpGatewayFcNodeEntry     OBJECT-TYPE
    SYNTAX                  IfcpGatewayFcNodeEntry
    MAX-ACCESS              not-accessible
    STATUS                  current
    DESCRIPTION
    "Information on FC nodes in the Gateway."
    INDEX                  {ifcpGatewayFcNodeWwn}
    ::= {ifcpGatewayFcNodeTable 1}

IfcpGatewayFcNodeEntry ::= SEQUENCE {
    ifcpGatewayFcNodeWwn      WwnType,
    ifcpGatewayFcNodeSymName  OCTET STRING,
    ifcpGatewayFcNodeAddrType InetAddressType,
    ifcpGatewayFcNodeAddr     InetAddress,
    ifcpGatewayFcNodeIPA      OCTET STRING
}

ifcpGatewayFcNodeWwn       OBJECT-TYPE
    SYNTAX                  WwnType

```

|             |           |
|-------------|-----------|
| MAX-ACCESS  | read-only |
| STATUS      | current   |
| DESCRIPTION |           |

|                |                       |             |
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"The FC Node WorldWideName as defined in the ifcp Specification."  
::= {ifcpGatewayFcNodeEntry 1}

|                          |                             |
|--------------------------|-----------------------------|
| ifcpGatewayFcNodeSymName | OBJECT-TYPE                 |
| SYNTAX                   | OCTET STRING (SIZE(0..256)) |
| MAX-ACCESS               | read-only                   |
| STATUS                   | current                     |
| DESCRIPTION              |                             |

"The FC Node Symbolic Name of the node as defined in the ifcp Specification. This is a variable-length text-based description of up to 256 bytes."  
::= {ifcpGatewayFcNodeEntry 2}

|                           |                 |
|---------------------------|-----------------|
| ifcpGatewayFcNodeAddrType | OBJECT-TYPE     |
| SYNTAX                    | InetAddressType |
| MAX-ACCESS                | read-only       |
| STATUS                    | current         |
| DESCRIPTION               |                 |

"The type of Inet address in the next object."  
::= {ifcpGatewayFcNodeEntry 3 }

|                       |             |
|-----------------------|-------------|
| ifcpGatewayFcNodeAddr | OBJECT-TYPE |
| SYNTAX                | InetAddress |
| MAX-ACCESS            | read-only   |
| STATUS                | current     |
| DESCRIPTION           |             |

"The FC Node Inet address of the node as defined in the ifcp Specification."  
::= {ifcpGatewayFcNodeEntry 4}

|                      |                        |
|----------------------|------------------------|
| ifcpGatewayFcNodeIPA | OBJECT-TYPE            |
| SYNTAX               | OCTET STRING (SIZE(8)) |
| MAX-ACCESS           | read-only              |
| STATUS               | current                |
| DESCRIPTION          |                        |

"The object identifies the FC Initial Process Associator of the node as defined in the ifcp Specification."  
::= {ifcpGatewayFcNodeEntry 5}

--  
-- ifcp session information -----  
--

ifcpGatewaySessionInfo      OBJECT IDENTIFIER ::= { ifcpGatewayObj 6}

-- Session Attributes Table

ifcpSessionAttributesTable OBJECT-TYPE

SYNTAX                              SEQUENCE OF

IfcpSessionAttributesEntry

MAX-ACCESS                          not-accessible

STATUS                               current

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DESCRIPTION

"."

::= { ifcpGatewaySessionInfo 1 }

ifcpSessionAttributesEntry OBJECT-TYPE

SYNTAX                               IfcpSessionAttributesEntry

MAX-ACCESS                          not-accessible

STATUS                               current

DESCRIPTION

"."

INDEX { ifcpSsnIndex }

::= { ifcpSessionAttributesTable 1 }

IfcpSessionAttributesEntry ::= SEQUENCE {

ifcpSessionIndex                    Unsigned32,

ifcpSessionLocalNode                WWNtype,

ifcpSessionRemoteNode               WWNtype

}

ifcpSessionIndex OBJECT-TYPE

SYNTAX                               Unsigned32 (1..4294967295)

MAX-ACCESS                          not-accessible

STATUS                               current

DESCRIPTION

"The session index."

::= { ifcpSessionAttributesEntry 1 }

ifcpSessionLocalNode      OBJECT-TYPE

SYNTAX                               WWNtype

MAX-ACCESS                          read-only

STATUS                               current

DESCRIPTION

"World Wide Name of the local node."

::= { ifcpSessionAttributesEntry 2 }

ifcpSessionRemoteNode      OBJECT-TYPE

SYNTAX                               WWNtype

```

        MAX-ACCESS          read-only
        STATUS              current
        DESCRIPTION
            "World Wide Name of the remote node."
 ::= { ifcpSessionAttributesEntry 3 }

--
-- Statistics
--

ifcpSessionStatsTable OBJECT-TYPE
    SYNTAX                  SEQUENCE OF IfcpSessionStatsEntry
    MAX-ACCESS              not-accessible
    STATUS                  current
    DESCRIPTION
        ". "
 ::= { ifcpGatewaySessionInfo 2 }

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ifcpSessionStatsEntry OBJECT-TYPE
    SYNTAX                  IfcpSessionStatsEntry
    MAX-ACCESS              not-accessible
    STATUS                  current
    DESCRIPTION
        ". "
    AUGMENTS { ifcpSessionAttributesEntry }
 ::= { ifcpSessionStatsTable 1 }

IfcpSessionStatsEntry ::= SEQUENCE {
    ifcpSessionCmdPdus      Counter32,
    ifcpSessionRspPdus      Counter32,
    ifcpSessionTxDataOctets Counter64,
    ifcpSessionRxDataOctets Counter64,
    ifcpSessionCRCErrors    Counter32,
    ifcpSessionCxnTimeoutErrors Counter32
}

ifcpSessionCmdPdus OBJECT-TYPE
    SYNTAX                  Counter32
    MAX-ACCESS              read-only
    STATUS                  current
    DESCRIPTION
        ". "
 ::= { ifcpSessionStatsEntry 1 }

ifcpSessionRspPdus OBJECT-TYPE
    SYNTAX                  Counter32

```

```

MAX-ACCESS          read-only
STATUS              current
DESCRIPTION
    "."
::= { ifcpSessionStatsEntry 2 }

ifcpSessionTxDataOctets OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "."
    ::= { ifcpSessionStatsEntry 3 }

ifcpSessionRxDataOctets OBJECT-TYPE
    SYNTAX          Counter64
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "."
    ::= { ifcpSessionStatsEntry 4 }

ifcpSessionCRCErrors OBJECT-TYPE
    SYNTAX          Counter32
    MAX-ACCESS      read-only

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    STATUS          current
    DESCRIPTION
        "."
    ::= { ifcpSessionStatsEntry 5 }

ifcpSessionCxnTimeoutErrors OBJECT-TYPE
    SYNTAX          Counter32
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
        "."
    ::= { ifcpSessionStatsEntry 6 }

-----

ifcpGroups OBJECT IDENTIFIER ::= { ifcpGatewayConformance 1 }

END

```

## 6. Security Considerations

There are a number of management objects defined in this MIB that have a MAX-ACCESS clause of read-write and/or read-create. Such objects may be considered sensitive or vulnerable in some network environments. The support for SET operations in a non-secure environment without proper protection can have a negative effect on network operations.

SNMPv1 by itself is not a secure environment. 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.

It is recommended that the implementers consider the security features as provided by the SNMPv3 framework. Specifically, the use of the User-based Security Model [RFC 2574](#) [[RFC2574](#)] and the View-based Access Control Model [RFC 2575](#) [[RFC2575](#)] is recommended.

It is then a customer/user responsibility to ensure that the SNMP entity giving access to an instance of this MIB, 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.

## 7. References

- [RFC2571] Harrington, D., Presuhn, R., and B. Wijnen, "An Architecture for Describing SNMP Management Frameworks", [RFC 2571](#), April 1999.
- [RFC1155] Rose, M., and K. McCloghrie, "Structure and  
Tseng Expires February 2002 19  
Internet Draft iFCP MIB August 2001  
Identification of Management Information for TCP/IP-  
based Internets", STD 16, [RFC 1155](#), May 1990.
- [RFC1212] Rose, M., and K. McCloghrie, "Concise MIB Definitions",  
STD 16, [RFC 1212](#), March 1991.
- [RFC1215] M. Rose, "A Convention for Defining Traps for use with  
the SNMP", [RFC 1215](#), March 1991.
- [RFC2578] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case,  
J., Rose, M., and S. Waldbusser, "Structure of  
Management Information Version 2 (SMIV2)", STD 58, [RFC  
2578](#), April 1999.
- [RFC2579] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case,

- J., Rose, M., and S. Waldbusser, "Textual Conventions for SMIV2", STD 58, [RFC 2579](#), April 1999.
- [RFC2580] McCloghrie, K., Perkins, D., Schoenwaelder, J., Case, J., Rose, M., and S. Waldbusser, "Conformance Statements for SMIV2", STD 58, [RFC 2580](#), April 1999.
- [RFC1157] Case, J., Fedor, M., Schoffstall, M., and J. Davin, "Simple Network Management Protocol", STD 15, [RFC 1157](#), May 1990.
- [RFC1901] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Introduction to Community-based SNMPv2", [RFC 1901](#), January 1996.
- [RFC1906] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Transport Mappings for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1906](#), January 1996.
- [RFC2572] Case, J., Harrington D., Presuhn R., and B. Wijnen, "Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)", [RFC 2572](#), April 1999.
- [RFC2574] Blumenthal, U., and B. Wijnen, "User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)", [RFC 2574](#), April 1999.
- [RFC1905] Case, J., McCloghrie, K., Rose, M., and S. Waldbusser, "Protocol Operations for Version 2 of the Simple Network Management Protocol (SNMPv2)", [RFC 1905](#), January 1996.
- [RFC2573] Levi, D., Meyer, P., and B. Stewart, "SNMPv3 Applications", [RFC 2573](#), April 1999.
- [RFC2575] Wijnen, B., Presuhn, R., and K. McCloghrie, "View-based Access Control Model (VACM) for the Simple Network Management Protocol (SNMP)", [RFC 2575](#), April 1999.

|                |                       |             |
|----------------|-----------------------|-------------|
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- [RFC2570] Case, J., Mundy, R., Partain, D., and B. Stewart, "Introduction to Version 3 of the Internet-standard Network Management Framework", [RFC 2570](#), April 1999.

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