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Definitions of Managed Objects for iSNS (Internet Storage Name Service)

Status of this Memo

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Abstract

The iSNS protocol provides storage name service functionality on an IP network that is being used for iSCSI or iFCP storage. This draft provides a mechanism to monitor multiple iSNS Servers, including information about registered objects in an iSNS Server.

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1. The Internet-Standard Management Framework

For a detailed overview of the documents that describe the current Internet-Standard Management Framework, please refer to [section 7 of RFC 3410](#) [[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, [RFC 2578](#) [[RFC2578](#)], STD 58, [RFC 2579](#) [[RFC2579](#)] and STD 58, [RFC 2580](#) [[RFC2580](#)].

2. Introduction

The iSNS protocol, as described in [RFC 4171](#) [[RFC4171](#)], can be used by IP based storage devices for dynamic registration and discovery of other storage devices in the network. It has the capability to group devices into storage Discovery Domains, and Discovery Domains into Discovery Domain Sets. The iSNS MIB is designed to allow SNMP to be used to monitor iSNS servers supporting iSCSI [[RFC3720](#)] and iFCP [[RFC4172](#)].

3. Technical Description

3.1 iSNS Registered Objects

The following entity relationship figure indicates the objects that can be registered in the iSNS, and their relationship to each other.

	* REGISTERED
+-----	ENTITIES
	INFO
	+-----+
+-----+	
iSNS	
NOTIFICATION	
INFO	
+-----+	

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The sections that are required to implement are for iSNS Server management and notification.

3.3 iSNS Server Info

The isnsServerInfo section provides the ability to monitor multiple iSNS Server instances. The isnsServerTable table provides information on each server instance. This table is indexed by the variable isnsServerIndex. The table indicates current settings for each iSNS server being managed. The network address, TCP and UDP ports being used by a server for iSNS registrations and queries can be determined from this table.

The count of objects registered in each iSNS server instance is shown in the table isnsNumObjectsTable. The provides a summary of the number Discovery Domain Sets, Discovery Domains, Entities, Portals, Portal Groups, iSCSI Nodes, and iFCP FC Nodes and Ports.

3.3.1 Control Node Information

As defined in the iSNS specification, Control Nodes are objects that have been registered with the server and are allowed to manage the iSNS server. These Control Nodes are identified by their iSCSI Node Name or iFCP FC Port Name. The isnsControlNodeInfo section of the MIB provides the ability to view the currently registered set of iSCSI and iFCP control nodes.

3.3.2 Discovery Domain Set (DDS)

The isnsDdsInfo section provides information on each registered DDS, the Discovery Domain members of each DDS, for each iSNS Server instance being managed. DDSs provide a method to group multiple Discovery Domains for easier control. As described in the iSNS Specification [[RFC4171](#)], a DDS can be enabled or disabled, which in turn enables or disables the member Discovery Domains. Discovery Domains that are contained in an enabled DDS are then enforced by an iSNS Server.

3.3.3 Discovery Domain (DD)

The `isnsDdInfo` section provides information on each registered DD, and the DD members, for each iSNS Server instance being managed. DDs are collections of storage nodes and portals that are allowed to discover one another. DD members can be iSCSI nodes, Entity Portals, or iFCP nodes.

3.3.4 Registered Storage Objects

The `isnsReg` section provides information on the registered storage objects for a specific iSNS Server instance. This section is divided into subsections for Entities, Portals, iSCSI Nodes, as well as iFCP Port and Node information.

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3.3.4.1 Registered Entities

The `isnsRegEntityInfo` section provides information on the registered entities. Entities are collections of storage nodes and portals.

3.3.4.2 Registered Portals

The `isnsRegPortalInfo` section provides information on the registered portals for a specific iSNS Server instance. Portals are logical IP-Address, TCP/UDP Port pairs that provide access to storage nodes contained in the associated Entity.

3.3.4.3 Registered Portal Groups

The `isnsRegPortalGroupInfo` section provides information on the registered portal groups for a specific iSNS Server instance. As described in iSCSI [[RFC3720](#)], Portal Groups provide a mapping between Portals and iSCSI Storage Nodes contained in an Entity.

3.3.4.4 Registered iSCSI Nodes

The `isnsRegIscsiNodeInfo` section provides information on the registered iSCSI Nodes for a specific iSNS Server instance. The iSCSI nodes are individual storage targets or initiators.

3.3.4.5 Registered FC Ports

The `isnsRegFcPortInfo` section provides information on the registered FC Ports for a specific iSNS Server instance. The FC Ports are ports associated with an iFCP gateway.

3.3.4.6 Registered FC Nodes

The isnsRegFcNodeInfo section provides information on the registered FC Nodes for a specific iSNS Server instance. The FC nodes are individual storage devices associated with an iFCP gateway.

3.4 Multiple Server Instances

The management of multiple instances of iSNS servers by the agent is supported. As described in [Section 3.3](#), each managed iSNS server instance has an entry in the table isnsServerTable.

3.5 iSNS Notifications

The isnsNotification section provides SNMP notifications for iSNS Server state changes.

4. MIB References and Requirement Levels

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The following MIB module has IMPORTS from [[RFC2578](#)], [[RFC2579](#)], [[RFC2580](#)], [[RFC3411](#)], [[RFC4001](#)], [[RFC4044](#)], and [[RFC4133](#)]. In REFERENCE clauses, it also refers to [[RFC3720](#)], [[RFC4171](#)], and [[RFC4172](#)].

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [[RFC2119](#)].

5. MIB Module

```
ISNS-MIB DEFINITIONS ::= BEGIN
  IMPORTS
    -- From RFC2578
    MODULE-IDENTITY,
    OBJECT-TYPE,
    NOTIFICATION-TYPE,
    Integer32,
    Unsigned32,
    Gauge32,
    mib-2
    FROM SNMPv2-SMI

    -- From RFC2579
    TEXTUAL-CONVENTION,
    TimeStamp,
    TruthValue
```

FROM SNMPv2-TC

- From [RFC2580](#)
OBJECT-GROUP,
MODULE-COMPLIANCE,
NOTIFICATION-GROUP
FROM SNMPv2-CONF
- From [RFC3411](#)
SnmpAdminString
FROM SNMP-FRAMEWORK-MIB
- From [RFC4001](#)
InetAddressType,
InetAddress,
InetAddressPortNumber
FROM INET-ADDRESS-MIB
- From [RFC4044](#)
FcNameIdOrZero,
FcAddressIdOrZero
FROM FC-MGMT-MIB
- From [RFC4133](#)
PhysicalIndex

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FROM ENTITY-MIB

;

isnsMIB MODULE-IDENTITY
LAST-UPDATED "200703160000Z"
ORGANIZATION "IETF IPS Working Group"
CONTACT-INFO "

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"

DESCRIPTION

"This module defines management information specific to internet Storage Name Service (iSNS) management.

Copyright (C) The IETF Trust (2007).
This version of this MIB module is part of RFC XXXX; see the RFC itself for full legal notices."

REVISION "200703160000Z"

DESCRIPTION

"Initial version of iSNS Management Module.
This MIB published as RFC XXXX."

-- RFC Ed.: replace XXXX with RFC number assigned to

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-- this document
 ::= { mib-2 YYYY }
-- RFC Ed.: enter the IANA assigned number to this MIB
-- for YYYY

--
-- Textual Conventions
--

IsnsDiscoveryDomainSetId ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"
STATUS current
DESCRIPTION

"The unique Discovery Domain Set Identifier associated with a Discovery Domain Set (DDS)."

REFERENCE "[RFC4171, Section 6.11.1.1](#)"
SYNTAX Unsigned32 (1 .. 4294967295)

IsnsDdsStatusType ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"The status of a Discovery Domain Set (DDS) registered in the
iSNS. The initially assigned values are below:

Bit	Status
-----	-----
31	DDS Enabled
All others	RESERVED

Setting a bit to 1 indicates the feature is enabled.
Otherwise it is disabled. The future assignment of any of
the reserved values will be documented in a revision of
[RFC4171](#)."

REFERENCE "[RFC4171, Section 6.11.1.3](#)"
SYNTAX BITS {
reserved0(0), reserved1(1), reserved2(2),
reserved3(3), reserved4(4), reserved5(5),
reserved6(6), reserved7(7), reserved8(8),
reserved9(9), reserved10(10), reserved11(11),
reserved12(12), reserved13(13), reserved14(14),
reserved15(15), reserved16(16), reserved17(17),
reserved18(18), reserved19(19), reserved20(20),
reserved21(21), reserved22(22), reserved23(23),
reserved24(24), reserved25(25), reserved26(26),
reserved27(27), reserved28(28), reserved29(29),
reserved30(30),
ddsEnabled (31)
}

IsnsDiscoveryDomainId ::= TEXTUAL-CONVENTION
DISPLAY-HINT "d"
STATUS current
DESCRIPTION

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"The unique Discovery Domain Identifier (DD_ID) associated
with each Discovery Domain (DD). This is used to
uniquely index and reference a DD."

REFERENCE "[RFC4171, Section 6](#)"
SYNTAX Unsigned32 (1 .. 4294967295)

IsnsDdFeatureType ::= TEXTUAL-CONVENTION
STATUS current
DESCRIPTION
"This type defines the features that each Discovery Domain
(DD) has.

Bit	Status
-----	-----
31	Boot List
All others	RESERVED

Boot List: this feature indicates that the targets in this DD provide boot capabilities for the member initiators.

Setting a bit to 1 indicates the feature is enabled. Otherwise it is disabled. The future assignment of any of the reserved values will be documented in a revision of [RFC4171](#)."

```

REFERENCE      "RFC4171, Section 6.11.2.9"
SYNTAX        BITS {
    reserved0(0), reserved1(1), reserved2(2),
    reserved3(3), reserved4(4), reserved5(5),
    reserved6(6), reserved7(7), reserved8(8),
    reserved9(9), reserved10(10), reserved11(11),
    reserved12(12), reserved13(13), reserved14(14),
    reserved15(15), reserved16(16), reserved17(17),
    reserved18(18), reserved19(19), reserved20(20),
    reserved21(21), reserved22(22), reserved23(23),
    reserved24(24), reserved25(25), reserved26(26),
    reserved27(27), reserved28(28), reserved29(29),
    reserved30(30),
    bootlist(31)
}

```

IsnsDdDdsModificationType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The methods that can be used to modify the Discovery Domain and Discovery Domain Sets in an iSNS Server instance.

Bit	Flag Description
-----	-----
0	Control Nodes are allowed
1	Target iSCSI Nodes are allowed
2	Initiator iSCSI Nodes are allowed
3	Target iFCP Ports are allowed

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4 Initiator iFCP Ports are allowed

Setting a bit to 1 indicates the feature is enabled. Otherwise it is disabled."

REFERENCE "[RFC4171, Section 2.4](#)"

```
SYNTAX          BITS {
                  controlNode(0),
                  targetIscsiNode(1),
                  initiatorIscsiNode(2),
                  targetIfcpNode(3),
                  initiatorIfcpNode(4)
                }
```

IsnsEntityIndexIdOrZero ::= TEXTUAL-CONVENTION

```
  DISPLAY-HINT  "d"
  STATUS        current
  DESCRIPTION
```

"The identifier for the unique integer Entity Index associated with an iSNS registered Entity object, and the value zero. The value zero is object-specific and MUST therefore be defined as part of the description of any object which uses this syntax. Examples of the usage of zero might include situations where the Entity is unknown, or not yet registered in the iSNS server. If a value of zero is not valid for an object, than that MUST be indicated."

```
  REFERENCE    "RFC4171, Section 6"
  SYNTAX       Unsigned32 ( 0 .. 4294967295 )
```

IsnsPortalGroupIndexId ::= TEXTUAL-CONVENTION

```
  DISPLAY-HINT  "d"
  STATUS        current
  DESCRIPTION
```

"The identifier for the unique integer Portal Group Index associated with an iSNS registered Portal Group object."

```
  REFERENCE    "RFC4171, Section 6"
  SYNTAX       Unsigned32 ( 1 .. 4294967295 )
```

IsnsPortalIndexId ::= TEXTUAL-CONVENTION

```
  DISPLAY-HINT  "d"
  STATUS        current
  DESCRIPTION
```

"The identifier for the unique integer Portal Index associated with an iSNS registered Portal object. The index is created by the iSNS Server for mapping between registered objects. The Portal Index used for a specific portal IP-address and port number pair is only persistent across reboots for portals that have been explicitly added to a Discovery Domain (DD). If a portal is not explicitly registered in any DD, then the index used for a portal can change after a server reinitialization."

```
  REFERENCE    "RFC4171, Section 6"
```

SYNTAX Unsigned32 (1 .. 4294967295)

IsnsPortalPortTypeId ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The UDP or TCP port type being used by a Portal for an Entity."

REFERENCE "[RFC4171, Section 6.3.2](#)"

SYNTAX INTEGER { udp(1), tcp(2) }

IsnsPortalGroupTagIdOrNull ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"

STATUS current

DESCRIPTION

"The Portal Group Tag (PGT) represents an association between a Portal and iSCSI Node using the value range 0 to 65535. A PGT with no association is a NULL value. The value of -1 indicates a NULL value."

REFERENCE "[RFC4171, Section 6.5.4](#), and [RFC3720](#)"

SYNTAX Integer32 (-1 .. 65535)

IsnsPortalSecurityType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"Indicates security attribute settings for a Portal that is registered in the iSNS server. The bitmapVALID field must be set in order for the contents to be considered valid information. The definitions of the bit fields are based on [RFC4171](#). The initial representation of each bit setting (0 or 1) is indicated below.

Bit	Flag Description
-----	-----
25	1 = Tunnel Mode Preferred; 0 = No Preference
26	1 = Transport Mode Preferred; 0 = No Preference
27	1 = PFS Enabled; 0 = PFS Disabled
28	1 = Aggressive Mode Enabled; 0 = Disabled
29	1 = Main Mode Enabled; 0 = MM Disabled
30	1 = IKE/IPsec Enabled; 0 = IKE/IPsec Disabled
31	1 = Bitmap VALID; 0 = INVALID
All others	RESERVED

The future assignment of any of the reserved values will be documented in a revision of [RFC4171](#)."

REFERENCE "[RFC4171, Section 6.3.9](#)"

SYNTAX BITS { reserved0(0), reserved1(1), reserved2(2), reserved3(3), reserved4(4), reserved5(5), reserved6(6), reserved7(7), reserved8(8),

reserved9(9), reserved10(10), reserved11(11),
reserved12(12), reserved13(13), reserved14(14),

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reserved15(15), reserved16(16), reserved17(17),
reserved18(18), reserved19(19), reserved20(20),
reserved21(21), reserved22(22), reserved23(23),
reserved24(24),
tunnelModePreferred(25),
transportModePreferred(26),
pfsEnabled(27),
agressiveModeEnabled(28),
mainModeEnabled(29),
ikeIPsecEnabled(30),
bitmapVALID(31)
}

IsnsNodeIndexId ::= TEXTUAL-CONVENTION

DISPLAY-HINT "d"
STATUS current
DESCRIPTION

"The identifier for the unique integer Node Index associated with a storage node. This index provides a 1 to 1 mapping to an iSCSI node name. The iSCSI node name maximum length is too long to be used for an index directly. The iSCSI node index used for a specific iSCSI node name is identical in all DDs, and is persistent across server reinitializations when the iSCSI node is a member of a Discovery Domain (DD) or is registered as a Control Node. Furthermore, index values for recently deregistered objects SHOULD NOT be reused in the short term."

REFERENCE "[RFC4171, Section 6.4.5](#)"
SYNTAX Unsigned32 (1 .. 4294967295)

IsnsIscsiNodeType ::= TEXTUAL-CONVENTION

STATUS current
DESCRIPTION

"The iSCSI Node Type defines the functions of the registered object. The definitions of each setting are defined in [RFC4171](#).

Bit	Node Type
-----	-----
29	Control
30	Initiator
31	Target
All others	RESERVED

Setting a bit to 1 indicates the node has the corresponding

characteristics. The future assignment of any of the reserved values will be documented in a revision of [RFC4171](#)."

REFERENCE ["RFC4171, Section 6.4.2"](#)

SYNTAX BITS {
reserved0(0), reserved1(1), reserved2(2),
reserved3(3), reserved4(4), reserved5(5),
reserved6(6), reserved7(7), reserved8(8),

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reserved9(9), reserved10(10), reserved11(11),
reserved12(12), reserved13(13), reserved14(14),
reserved15(15), reserved16(16), reserved17(17),
reserved18(18), reserved19(19), reserved20(20),
reserved21(21), reserved22(22), reserved23(23),
reserved24(24), reserved25(25), reserved26(26),
reserved27(27), reserved28(28),
control(29),
initiator(30),
target(31)
}

IsnsFcClassOfServiceType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"This defines the Fibre Channel Class of Service types that are supported by the registered port. The definitions are as defined in [RFC4171](#)."

Bit	FC COS Type
-----	-----
28	Fibre Channel Class 3 Supported
29	Fibre Channel Class 2 Supported
All others	RESERVED

Setting a bit to 1 indicates the class of service is supported. The future assignment of any of the reserved values will be documented in a revision of [RFC4171](#)."

REFERENCE ["RFC4171, Section 6.6.8"](#)

SYNTAX BITS {
reserved0(0), reserved1(1), reserved2(2),
reserved3(3), reserved4(4), reserved5(5),
reserved6(6), reserved7(7), reserved8(8),
reserved9(9), reserved10(10), reserved11(11),
reserved12(12), reserved13(13), reserved14(14),
reserved15(15), reserved16(16), reserved17(17),
reserved18(18), reserved19(19), reserved20(20),
reserved21(21), reserved22(22), reserved23(23),

```

reserved24(24), reserved25(25), reserved26(26),
reserved27(27),
class3(28),
class2(29)
}

```

IsnsIscsiScnType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The iSCSI Node State Change Notification (SCN) values for a node as defined in [RFC4171](#).

Bit	Description
-----	-----
24	Initiator and self information only

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25	Target and self information only
26	Management registration/SCN
27	Object removed
28	Object added
29	Object updated
30	DD or DDS member removed (Mgmt Reg/SCN only)
31 (Lsb)	DD or DDS member added (Mgmt Reg/SCN only)
All others	Reserved

Setting a bit to 1 indicates that type of SCN is enabled. The future assignment of any of the reserved values will be documented in a revision of [RFC4171](#)."

REFERENCE "[RFC4171, Section 6.4.4](#)"

SYNTAX BITS {

```

reserved0(0), reserved1(1), reserved2(2),
reserved3(3), reserved4(4), reserved5(5),
reserved6(6), reserved7(7), reserved8(8),
reserved9(9), reserved10(10), reserved11(11),
reserved12(12), reserved13(13), reserved14(14),
reserved15(15), reserved16(16), reserved17(17),
reserved18(18), reserved19(19), reserved20(20),
reserved21(21), reserved22(22), reserved23(23),
initiatorAndSelfOnly(24),
targetAndSelfOnly(25),
managementRegistrationScn(26),
objectRemoved(27),
objectAdded(28),
objectUpdated(29),
ddOrDdsMemberRemoved(30),
ddOrDdsMemberAdded(31)

```

}

IsnsIfcpScnType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The iFCP State Change Notification (SCN) values for an iFCP object as defined in [RFC4171](#).

Bit	Description
-----	-----
24	Initiator and self information only
25	Target and self information only
26	Management registration/SCN
27	Object removed
28	Object added
29	Object updated
30	DD or DDS member removed (Mgmt Reg/SCN only)
31 (Lsb)	DD or DDS member added (Mgmt Reg/SCN only)
All others	Reserved

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Setting a bit to 1 indicates that type of SCN is enabled.
The future assignment of any of the reserved values will be documented in a revision of [RFC4171](#)."

REFERENCE "[RFC4171, Section 6.6.12](#)"

SYNTAX BITS {
reserved0(0), reserved1(1), reserved2(2),
reserved3(3), reserved4(4), reserved5(5),
reserved6(6), reserved7(7), reserved8(8),
reserved9(9), reserved10(10), reserved11(11),
reserved12(12), reserved13(13), reserved14(14),
reserved15(15), reserved16(16), reserved17(17),
reserved18(18), reserved19(19), reserved20(20),
reserved21(21), reserved22(22), reserved23(23),
initiatorAndSelfOnly(24),
targetAndSelfOnly(25),
managementRegistrationScn(26),
objectRemoved(27),
objectAdded(28),
objectUpdated(29),
ddOrDdsMemberRemoved(30),
ddOrDdsMemberAdded(31)
}

IsnsFcPortRoleType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The FC Port Role defines the functions of the registered object. The definitions of each setting are defined in [RFC4171](#).

Bit	Port Role
-----	-----
29	Control
30	FCP Initiator
31	FCP Target
All others	RESERVED

Setting a bit to 1 indicates the port has the corresponding characteristics. The future assignment of any of the reserved values will be documented in a revision of [RFC4171](#)."

REFERENCE ["RFC4171, Section 6.6.13"](#)

SYNTAX BITS {
 reserved0(0), reserved1(1), reserved2(2),
 reserved3(3), reserved4(4), reserved5(5),
 reserved6(6), reserved7(7), reserved8(8),
 reserved9(9), reserved10(10), reserved11(11),
 reserved12(12), reserved13(13), reserved14(14),
 reserved15(15), reserved16(16), reserved17(17),
 reserved18(18), reserved19(19), reserved20(20),
 reserved21(21), reserved22(22), reserved23(23),
 reserved24(24), reserved25(25), reserved26(26),

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reserved27(27), reserved28(28),
 control(29),
 initiator(30),
 target(31)
 }

IsnsSrvrDiscoveryMethodsType ::= TEXTUAL-CONVENTION

STATUS current

DESCRIPTION

"The types of iSNS Server discovery methods that are enabled on an iSNS Server. The options are DHCP, SLP, multicast group iSNS heartbeat, broadcast group iSNS heartbeat, configured server list, and other. The iSNS Server may support additional discovery methods not indicated."

REFERENCE ["RFC4171, Section 2.5"](#)

SYNTAX BITS {
 dhcp(0),
 slp(1),
 multicastGroupHb(2),
 broadcastHb(3),

```

        cfgdServerList(4),
        other(5)
    }

--
-- Internet Storage Name Service Management
--

isnsNotifications      OBJECT IDENTIFIER ::=
    { isnsMIB 0 }
isnsObjects            OBJECT IDENTIFIER ::=
    { isnsMIB 1 }
isnsConformance       OBJECT IDENTIFIER ::=
    { isnsMIB 2 }

--
-- iSNS Server instance managed objects -----
--

isnsServerInfo OBJECT IDENTIFIER ::= { isnsObjects 1 }

isnsServerTable      OBJECT-TYPE
    SYNTAX             SEQUENCE OF IsnsServerEntry
    MAX-ACCESS         not-accessible
    STATUS              current
    DESCRIPTION
    "This table provides a list of the iSNS Server instances
    that are managed through the same SNMP context."
    ::= { isnsServerInfo 1 }

isnsServerEntry      OBJECT-TYPE

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    SYNTAX             IsnsServerEntry
    MAX-ACCESS         not-accessible
    STATUS              current
    DESCRIPTION
    "This is a row in the iSNS Server instance table.  The number
    of rows is dependent on the number of iSNS Server instances
    that are being managed through same SNMP context."
    INDEX { isnsServerIndex }
    ::= { isnsServerTable 1 }

IsnsServerEntry ::=
    SEQUENCE {
        isnsServerIndex      Unsigned32,
        isnsServerName       SnmpAdminString,
        isnsServerIsnsVersion Unsigned32,

```

```

isnsServerVendorInfo      SnmpAdminString,
isnsServerPhysicalIndex  PhysicalIndex,
isnsServerTcpPort        InetPortNumber,
isnsServerUdpPort        InetPortNumber,
isnsServerDiscontinuityTime
                           TimeStamp,
isnsServerRole            INTEGER,
isnsServerDiscoveryMethodsEnabled
                           IsnsSrvrDiscoveryMethodsType,
isnsServerDiscoveryMcGroupType
                           InetAddressType,
isnsServerDiscoveryMcGroupAddress
                           InetAddress,
isnsServerEsiNonResponseThreshold
                           Unsigned32,
isnsServerEnableControlNodeMgtScn
                           TruthValue,
isnsServerDefaultDdDdsStatus
                           INTEGER,
isnsServerUpdateDdDdsSupported
                           IsnsDdDdsModificationType,
isnsServerUpdateDdDdsEnabled
                           IsnsDdDdsModificationType
    }

```

```

isnsServerIndex          OBJECT-TYPE
    SYNTAX                Unsigned32 ( 1 .. 4294967295 )
    MAX-ACCESS            not-accessible
    STATUS                 current
    DESCRIPTION

```

"This object uniquely identifies the iSNS Server being managed by the SNMP context and is the key for this table. This is an instance index for each iSNS Server being managed. The value of this object is used elsewhere in the MIB to reference specific iSNS Servers."

```
 ::= { isnsServerEntry 1 }
```

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```

isnsServerName          OBJECT-TYPE
    SYNTAX                SnmpAdminString
    MAX-ACCESS            read-only
    STATUS                 current
    DESCRIPTION

```

"A non-unique name that can be assigned to the iSNS Server instance. If not configured, then the string SHALL be zero-length."

```
 ::= { isnsServerEntry 2 }
```

```

isnsServerIsnsVersion      OBJECT-TYPE
    SYNTAX                  Unsigned32 ( 0 .. 65535 )
    MAX-ACCESS              read-only
    STATUS                  current
    DESCRIPTION
        "The iSNS version value as contained in messages received
        from the current primary server.  The header of each iSNSP
        message contains the iSNS version of the sender.  If
        unknown the reported value is 0."
    REFERENCE                "RFC4171"
    DEFVAL                  { 1 }
    ::= { isnsServerEntry 3 }

```

```

isnsServerVendorInfo      OBJECT-TYPE
    SYNTAX                  SnmpAdminString
    MAX-ACCESS              read-only
    STATUS                  current
    DESCRIPTION
        "If this server instance is utilizing the product of a
        particular 'vendor', then this managed object contains
        that vendor's name and version.  Otherwise, then the
        string SHALL be zero-length.  The format of the string
        is as follows: Vendor Name, Vendor Version, Vendor
        Defined Information.

```

Field	Description
Vendor Name	The name of the vendor (if one exists)
Vendor Version	The version of the vendor product
Vendor Defined	This follows the second comma in the string, if one exists, and is vendor defined

```

"
    ::= { isnsServerEntry 4 }

```

```

isnsServerPhysicalIndex   OBJECT-TYPE
    SYNTAX                  PhysicalIndex
    MAX-ACCESS              read-only
    STATUS                  current
    DESCRIPTION
        "An index identifying the network interface for this iSNS
        Server within a network entity.  This index maps to the

```

entPhysicalIndex of entPhysicalTable table in [RFC4133](#). The entPhysicalClass value for the table row must be 'port' as the interface must be able to send and receive data."

REFERENCE ["RFC4133, RFC4171, Section 2.5 - 2.8"](#)

::= { isnsServerEntry 5 }

isnsServerTcpPort OBJECT-TYPE
SYNTAX InetPortNumber
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"Indicates the TCP port this iSNS instance is accepting iSNSP messages on, generally the iSNS well known port. The well known TCP port for iSNSP is 3205. If TCP is not supported by this server instance, then the value is 0."

::= { isnsServerEntry 6 }

isnsServerUdpPort OBJECT-TYPE
SYNTAX InetPortNumber
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"Indicates the UDP port this iSNS instance is accepting iSNSP messages on, generally the iSNS well known port. The well known UDP port for iSNSP is 3205. If UDP is not supported by this server instance, then the value is 0."

::= { isnsServerEntry 7 }

isnsServerDiscontinuityTime OBJECT-TYPE
SYNTAX TimeStamp
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The value of sysUpTime on the most recent occasion that this iSNS server became active or suffered a discontinuity."

::= { isnsServerEntry 8 }

isnsServerRole OBJECT-TYPE
SYNTAX INTEGER { notSet(1),
server(2),
backupServer(3) }

MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The current operational mode of this iSNS Server instance.

Value	Description
----- notSet	----- The iSNS Server role is not

configured.

server The iSNS Server instance is an operational iSNS Server.

backupServer The iSNS Server instance is currently acting as a backup."

REFERENCE ["RFC4171, Section 2.7 - 2.8"](#)

::= { isnsServerEntry 9 }

isnsServerDiscoveryMethodsEnabled OBJECT-TYPE

SYNTAX IsnsSrvrDiscoveryMethodsType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates the discovery methods currently enabled for this iSNS Server instance. This allows a client to determine what discovery methods that can be used for this iSNS Server. Additional methods of discovery may also be supported."

::= { isnsServerEntry 10 }

isnsServerDiscoveryMcGroupType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The type of Internet address in isnsServerDiscoveryMcGroupAddress. If the address is specified, then it must be a valid multicast address and the value of this object must be ipv4(1), ipv6(2), ipv4z(3), or ipv6z(4); otherwise, then the value of this object is unknown(0), and the value of isnsServerDiscoveryMcGroupAddress is the zero-length string."

::= { isnsServerEntry 11 }

isnsServerDiscoveryMcGroupAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The multicast group that iSNS Heartbeat messages are sent to if multicast based discovery has been enabled for this server instance. If not configured, then the string SHALL be zero-length. The format of this object is specified by isnsServerDiscoveryMcGroupType."

::= { isnsServerEntry 12 }

isnsServerEsiNonResponseThreshold OBJECT-TYPE

SYNTAX Unsigned32 (0 .. 65535)

MAX-ACCESS read-only
STATUS current
DESCRIPTION
"ESI Non-Response Threshold - the number of ESI

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messages that will be sent without receiving a response before an entity is deregistered from the iSNS database. A value of 0 indicates Entities will never be deregistered due to non-receipt of ESI messages."

REFERENCE "[RFC4171, Section 2.4](#)"

DEFVAL { 3 }

::= { isnsServerEntry 13 }

isnsServerEnableControlNodeMgtScn OBJECT-TYPE

SYNTAX TruthValue

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"Indicates if the iSNS Server administrative option to send Management SCNs to Control Nodes is enabled. Management SCNs are used by Control Nodes to monitor and control an iSNS Server. If enabled, Control Nodes can register to receive Management SCNs."

REFERENCE "[RFC4171, Section 2.2.3, 2.4](#)"

DEFVAL { true }

::= { isnsServerEntry 14 }

isnsServerDefaultDdDdsStatus OBJECT-TYPE

SYNTAX INTEGER { inNoDomain(1),
inDefaultDdAndDds(2) }

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"This indicates the Discovery Domain (DD) and Discovery Domain Set (DDS) membership status for a new device when registered in the iSNS Server instance. Either the new device will not be in a DD/DDS, or will be placed into a default DD and default DDS. The default setting is inNoDomain."

REFERENCE "[RFC4171, Section 2.4](#)"

DEFVAL { inNoDomain }

::= { isnsServerEntry 15 }

isnsServerUpdateDdDdsSupported OBJECT-TYPE

SYNTAX IsnsDdDdsModificationType

MAX-ACCESS read-only

STATUS current

DESCRIPTION
"The methods that this iSNS Server instance supports
to modify Discovery Domains and Discovery Domain Sets."
REFERENCE "[RFC4171, Section 2.4](#)"
::= { isnsServerEntry 16 }

isnsServerUpdateDdDdsEnabled OBJECT-TYPE
SYNTAX IsnsDdDdsModificationType
MAX-ACCESS read-only
STATUS current

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DESCRIPTION
"This indicates the methods this server instance currently
allows for modifying Discovery Domains and Discovery
Domain Sets."
REFERENCE "[RFC4171](#), Sec 2.2.2 and 2.4"
::= { isnsServerEntry 17 }

--
-- Count of objects currently registered in a server instance
--

isnsNumObjectsTable OBJECT-TYPE
SYNTAX SEQUENCE OF
IsnsNumObjectsEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION
"Table providing the number of registered objects of each
type in the iSNS Server instance. The number of entries is
dependent upon the number of iSNS Server instances being
managed."
::= { isnsServerInfo 2 }

isnsNumObjectsEntry OBJECT-TYPE
SYNTAX IsnsNumObjectsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"Entry of an iSNS Server instance."
AUGMENTS { isnsServerEntry }
::= { isnsNumObjectsTable 1 }

IsnsNumObjectsEntry ::= SEQUENCE {
isnsNumDds Gauge32,
isnsNumDd Gauge32,
isnsNumEntities Gauge32,

```
isnsNumPortals      Gauge32,
isnsNumPortalGroups Gauge32,
isnsNumIscsiNodes   Gauge32,
isnsNumFcPorts      Gauge32,
isnsNumFcNodes      Gauge32
                    }
```

```
isnsNumDds          OBJECT-TYPE
  SYNTAX             Gauge32 ( 0 .. 4294967295 )
  MAX-ACCESS         read-only
  STATUS              current
  DESCRIPTION
    "The current total number of Discovery Domain Sets
    in this iSNS instance. This is the number of rows
    in the isnsDdsTable."
    ::= { isnsNumObjectsEntry 1 }
```

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```
isnsNumDd           OBJECT-TYPE
  SYNTAX             Gauge32 ( 0 .. 4294967295 )
  MAX-ACCESS         read-only
  STATUS              current
  DESCRIPTION
    "The current total number of Discovery Domains
    in this iSNS instance. This is the number of rows in the
    isnsDdTable."
    ::= { isnsNumObjectsEntry 2 }
```

```
isnsNumEntities     OBJECT-TYPE
  SYNTAX             Gauge32 ( 0 .. 4294967295 )
  MAX-ACCESS         read-only
  STATUS              current
  DESCRIPTION
    "The current number of Entities registered in this
    iSNS Server instance. This is the number of rows in
    the isnsRegEntityTable for this instance."
    ::= { isnsNumObjectsEntry 3 }
```

```
isnsNumPortals      OBJECT-TYPE
  SYNTAX             Gauge32 ( 0 .. 4294967295 )
  MAX-ACCESS         read-only
  STATUS              current
  DESCRIPTION
    "The current total number of Portals registered in iSNS.
    This is the number of rows in isnsRegPortalTable."
    ::= { isnsNumObjectsEntry 4 }
```

```
isnsNumPortalGroups      OBJECT-TYPE
    SYNTAX                 Gauge32 ( 0 .. 4294967295 )
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
"The current total number of Portal Groups registered in
iSNS.  This is the number of rows in isnsRegPgTable."
 ::= { isnsNumObjectsEntry 5 }
```

```
isnsNumIscsiNodes       OBJECT-TYPE
    SYNTAX                 Gauge32 ( 0 .. 4294967295 )
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
"The current total number of iSCSI node entries registered
in the iSNS.  This is the number rows in
isnsRegIscsiNodeTable."
 ::= { isnsNumObjectsEntry 6 }
```

```
isnsNumFcPorts          OBJECT-TYPE
    SYNTAX                 Gauge32 ( 0 .. 4294967295 )
    MAX-ACCESS             read-only
```

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```
STATUS                 current
DESCRIPTION
"The current total number of FC Port entries registered
in the iSNS.  This is the number of rows in
isnsRegFcPortTable."
 ::= { isnsNumObjectsEntry 7 }
```

```
isnsNumFcNodes          OBJECT-TYPE
    SYNTAX                 Gauge32 ( 0 .. 4294967295 )
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
"The current total number of FC node entries registered
in the iSNS.  This is the number of rows in
isnsRegFcNodeTable."
 ::= { isnsNumObjectsEntry 8 }
```

```
--
-- Control node information
--
```

```
isnsControlNodeInfo     OBJECT IDENTIFIER ::=
                        { isnsServerInfo 3 }
```

--
-- Specific iSCSI Nodes authorized to register as Control
-- Nodes
--

isnsControlNodeIscsiTable OBJECT-TYPE
SYNTAX SEQUENCE OF
IsnsControlNodeIscsiEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Specified iSCSI Nodes that can register or are registered
as control nodes. The number of rows is dependent on the
number of iSCSI Control Nodes."
 ::= { isnsControlNodeInfo 1 }

isnsControlNodeIscsiEntry OBJECT-TYPE
SYNTAX IsnsControlNodeIscsiEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"This is an iSCSI Control Node entry for a specific iSNS
server instance."
 INDEX { isnsServerIndex,
 isnsControlNodeIscsiNodeIndex }
 ::= { isnsControlNodeIscsiTable 1 }

IsnsControlNodeIscsiEntry ::= SEQUENCE {

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isnsControlNodeIscsiNodeIndex IsnsNodeIndexId,
isnsControlNodeIscsiNodeName SnmpAdminString,
isnsControlNodeIscsiIsRegistered TruthValue,
isnsControlNodeIscsiRcvMgtSCN TruthValue
}

isnsControlNodeIscsiNodeIndex OBJECT-TYPE
SYNTAX IsnsNodeIndexId
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The index for the iSCSI storage node authorized to act
as a control node."
 ::= { isnsControlNodeIscsiEntry 1 }

isnsControlNodeIscsiNodeName OBJECT-TYPE
SYNTAX SnmpAdminString
MAX-ACCESS read-only

STATUS current
DESCRIPTION
"The iSCSI Name of the initiator or target associated with the storage node. The iSCSI Name can not be longer than 223 bytes. The iSNS Server internal maximum size is 224 bytes to provide NULL termination. This is the iSCSI Node Name for the storage node authorized and/or acting as a control node."
 ::= { isnsControlNodeIscsiEntry 2 }

isnsControlNodeIscsiIsRegistered OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates whether the control node is currently registered in the iSNS Server instance."
 ::= { isnsControlNodeIscsiEntry 3 }

isnsControlNodeIscsiRcvMgtSCN OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"Indicates whether the Control Node has registered to receive Management SCNs. Management SCNs are sent to a Control Node if they are enabled, as indicated by isnsServerEnableControlNodeMgtScn, and the Control Node has registered for them."
REFERENCE "[RFC4171, Section 2.2.3](#), 2.4"
 ::= { isnsControlNodeIscsiEntry 4 }

--
-- Specific FC Ports authorized to register as Control

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-- Nodes
--

isnsControlNodeFcPortTable OBJECT-TYPE
SYNTAX SEQUENCE OF
 IsnsControlNodeFcPortEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Specified FC Ports that can register or are registered as control nodes. The number of rows is dependent on the number of FC Port Control Nodes."

```
::= { isnsControlNodeInfo 2 }
```

```
isnsControlNodeFcPortEntry OBJECT-TYPE  
SYNTAX IsnsControlNodeFcPortEntry  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION
```

```
"FC Port control node entry."
```

```
INDEX { isnsServerIndex,  
isnsControlNodeFcPortWwpn }
```

```
::= { isnsControlNodeFcPortTable 1 }
```

```
IsnsControlNodeFcPortEntry ::= SEQUENCE {  
isnsControlNodeFcPortWwpn FcNameIdOrZero,  
isnsControlNodeFcPortIsRegistered TruthValue,  
isnsControlNodeFcPortRcvMgtSCN TruthValue  
}
```

```
isnsControlNodeFcPortWwpn OBJECT-TYPE  
SYNTAX FcNameIdOrZero (SIZE(8))  
MAX-ACCESS not-accessible  
STATUS current  
DESCRIPTION
```

```
"The FC Port World Wide Port Name that can and/or is acting  
as a Control Node for the specified iSNS Server. A zero  
length string is not valid for this managed object.  
This managed object, combined with the isnsServerIndex, is  
the key for this table."
```

```
::= { isnsControlNodeFcPortEntry 1 }
```

```
isnsControlNodeFcPortIsRegistered OBJECT-TYPE  
SYNTAX TruthValue  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION
```

```
"Indicates whether the control node is currently  
registered in the iSNS Server instance."
```

```
::= { isnsControlNodeFcPortEntry 2 }
```

```
isnsControlNodeFcPortRcvMgtSCN OBJECT-TYPE
```

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```
SYNTAX TruthValue  
MAX-ACCESS read-only  
STATUS current  
DESCRIPTION
```

```
"Indicates whether the Control Node has registered to  
receive Management SCNs. Management SCNs are sent to
```

a Control Node if they are enabled, as indicated by isnsServerEnableControlNodeMgtScn, and the Control Node has registered for them."

REFERENCE "[RFC4171, Section 2.2.3](#), 2.4"

::= { isnsControlNodeFcPortEntry 3 }

--

-- Discovery Domain Set information

--

isnsDdsInfo OBJECT IDENTIFIER ::= { isnsServerInfo 4 }

--

-- Discovery Domain Set Registrations -----

--

isnsDdsTable OBJECT-TYPE
SYNTAX SEQUENCE OF IsnsDdsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"A table containing configuration information for each Discovery Domain Set (DDS) registered in the iSNS Server instance. The number of rows in the table is dependent on the number of DDSs registered in the specified iSNS server instance."

::= { isnsDdsInfo 1 }

isnsDdsEntry OBJECT-TYPE
SYNTAX IsnsDdsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"Information on one Discovery Domain Set (DDS) registered in the iSNS Server instance."

INDEX { isnsServerIndex, isnsDdsId }

::= { isnsDdsTable 1 }

IsnsDdsEntry ::=
SEQUENCE {
 isnsDdsId IsnsDiscoveryDomainSetId,
 isnsDdsSymbolicName SnmpAdminString,
 isnsDdsStatus IsnsDdsStatusType
}

isnsDdsId OBJECT-TYPE

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SYNTAX IsnsDiscoveryDomainSetId

MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The ID that refers to this Discovery Domain Set and
index to the table."
 ::= { isnsDdsEntry 1 }

isnsDdsSymbolicName OBJECT-TYPE
SYNTAX SnmpAdminString
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The Discovery Domain Set Symbolic Name field contains
a unique variable-length description (up to 255 bytes)
that is associated with the DDS. If a Symbolic Name is
not provided, then one will be generated by the iSNS
server."
REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsDdsEntry 2 }

isnsDdsStatus OBJECT-TYPE
SYNTAX IsnsDdsStatusType
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The status of this Discovery Domain Set (DDS)."
REFERENCE "[RFC4171, Section 6.11.1.3](#)"
 ::= { isnsDdsEntry 3 }

--
-- Discovery Domain Set Members -----
--
--
-- DDS Membership Assignment
--

isnsDdsMemberTable OBJECT-TYPE
SYNTAX SEQUENCE OF IsnsDdsMemberEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table containing Discovery Domains (DDs) that have
been assigned to specific Discovery Domain Sets (DDSs).
The number of rows in the table is dependent on the
number of DD to DDS relationships in the iSNS instance."
 ::= { isnsDdsInfo 2 }

isnsDdsMemberEntry OBJECT-TYPE
SYNTAX IsnsDdsMemberEntry

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```

    MAX-ACCESS             not-accessible
    STATUS                 current
    DESCRIPTION
"The mapping of one Discovery Domain (DD) to a Discovery
Domain Set (DDS).  This indicates the DD is a member of
the DDS."
    INDEX      { isnsServerIndex,
                isnsDdsId,
                isnsDdsMemberDdId }
    ::= { isnsDdsMemberTable 1 }

IsnsDdsMemberEntry ::=
    SEQUENCE {
        isnsDdsMemberDdId      IsnsDiscoveryDomainId,
        isnsDdsMemberSymbolicName SnmpAdminString
    }

isnsDdsMemberDdId          OBJECT-TYPE
    SYNTAX                 IsnsDiscoveryDomainId
    MAX-ACCESS             not-accessible
    STATUS                 current
    DESCRIPTION
"The ID that identifies the Discovery Domain
which is a member of the Discovery Domain Set."
    ::= { isnsDdsMemberEntry 1 }

isnsDdsMemberSymbolicName  OBJECT-TYPE
    SYNTAX                 SnmpAdminString
    MAX-ACCESS             read-only
    STATUS                 current
    DESCRIPTION
"The Symbolic Name of the Discovery Domain that is a member
of this DDS.  This value SHALL be identical to the object
isnsDdSymbolicName for the associated DD ID."
    REFERENCE "RFC4171, Section 6"
    ::= { isnsDdsMemberEntry 2 }

--
-- Discovery Domain information
--

isnsDdInfo          OBJECT IDENTIFIER ::= { isnsServerInfo 5 }

--
-- Discovery Domain Registrations -----
--
```

isnsDdTable OBJECT-TYPE
 SYNTAX SEQUENCE OF IsnsDdEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

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"A table containing configuration information for each Discovery Domain (DD) registered in the iSNS. The number of rows in the table is dependent on the number of DDs registered in the iSNS instance."

::= { isnsDdInfo 1 }

isnsDdEntry OBJECT-TYPE
 SYNTAX IsnsDdEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"Information on a Discovery Domain (DD) registered in the iSNS Server instance."

 INDEX { isnsServerIndex, isnsDdId}
 ::= { isnsDdTable 1 }

IsnsDdEntry ::=
 SEQUENCE {
 isnsDdId IsnsDiscoveryDomainId,
 isnsDdSymbolicName SnmpAdminString,
 isnsDdFeatures IsnsDdFeatureType
 }

isnsDdId OBJECT-TYPE
 SYNTAX IsnsDiscoveryDomainId
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"The ID that refers to this Discovery Domain, and the index to the table."

 REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsDdEntry 1 }

isnsDdSymbolicName OBJECT-TYPE
 SYNTAX SnmpAdminString
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION

"The Discovery Domain Symbolic Name field contains a unique variable-length description (up to 255 bytes) that is associated with the DD."


```

IsnsDdIscsiMemberEntry ::=
    SEQUENCE {
        isnsDdIscsiMemberIndex    IsnsNodeIndexId,
        isnsDdIscsiMemberName     SnmpAdminString,
        isnsDdIscsiMemberIsRegistered TruthValue
    }

```

```

isnsDdIscsiMemberIndex    OBJECT-TYPE
    SYNTAX                  IsnsNodeIndexId
    MAX-ACCESS              not-accessible
    STATUS                   current
    DESCRIPTION
        "The index for this member iSCSI node entry."
    REFERENCE "RFC4171, Section 6"
    ::= { isnsDdIscsiMemberEntry 1 }

```

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```

isnsDdIscsiMemberName    OBJECT-TYPE
    SYNTAX                  SnmpAdminString (SIZE (0..223))
    MAX-ACCESS              read-only
    STATUS                   current
    DESCRIPTION

```

"The iSCSI Name associated with the storage node. The iSCSI Name can not be longer than 223 bytes. The iSNS server internal maximum size is 224 bytes to provide NULL termination. This is the iSCSI Name for the storage node that is a member of the DD. This value maps 1 to 1 to the isnsDdIscsiMemberIndex node index. The iSCSI Name field is too long to be easily used for an index directly. The node index used for a specific node name is only persistent across iSNS Server reinitializations for nodes that are in a Discovery Domain (DD) or are registered control nodes. This value is only required during row creation if the storage node is not yet registered in the iSNS Server instance. If the storage node is not yet registered, then the iSCSI Name MUST be provided with the iSCSI node index during row creation in order to create the 1 to 1 mapping."

```

    REFERENCE "RFC4171, Section 6"
    ::= { isnsDdIscsiMemberEntry 2 }

```

```

isnsDdIscsiMemberIsRegistered OBJECT-TYPE
    SYNTAX                  TruthValue
    MAX-ACCESS              read-only
    STATUS                   current
    DESCRIPTION

```

"This indicates whether this member of the DD is currently registered in the iSNS Server instance. iSCSI Storage Node members do not need to be currently registered in order for their iSCSI Name and Index to be added to a DD."

REFERENCE "[RFC4171, Section 6.11](#)"
 ::= { isnsDdIscsiMemberEntry 3 }

--
-- DD Portal Membership Assignment
--

isnsDdPortalMemberTable	OBJECT-TYPE
SYNTAX	SEQUENCE OF
	IsnsDdPortalMemberEntry
MAX-ACCESS	not-accessible
STATUS	current
DESCRIPTION	

"A table containing currently registered and unregistered portal objects that have been explicitly assigned to specific DDs. Explicit assignment of a portal to a DD is only done when a specific set of portals are preferred for use within a DD. Otherwise, for iSCSI, the Portal

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Group Object should be used for identifying which portals provide access to which storage nodes. The number of rows in the table is dependent on the number of explicit relationships between portals and DDs registered in the iSNS."

REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsDdInfo 3 }

isnsDdPortalMemberEntry	OBJECT-TYPE
SYNTAX	IsnsDdPortalMemberEntry
MAX-ACCESS	not-accessible
STATUS	current
DESCRIPTION	

"Each entry indicates an explicit addition of a portal to a discovery domain. The explicit addition of an entity portal to a discovery domain indicates the portal is preferred for access to nodes of the entity for this discovery domain. Registered Portal Group objects are used in iSCSI to indicate mapping of portals to nodes across all discovery domains. Portals that have been explicitly mapped a discovery domain will be returned as part of a query that is scoped to that discovery domain. If no portal of an entity has been explicitly mapped to a discovery domain,

then all portals of the entity that provide access to a storage node are returned as part of a query. The table indexes are the server instance, the DD ID of the Discovery Domain, and the Portal Index of the portal."

```
INDEX { isnsServerIndex,
        isnsDdId,
        isnsDdPortalMemberIndex }
 ::= { isnsDdPortalMemberTable 1 }
```

IsnsDdPortalMemberEntry ::=

```
SEQUENCE {
    isnsDdPortalMemberIndex      IsnsPortalIndexId,
    isnsDdPortalMemberAddressType InetAddressType,
    isnsDdPortalMemberAddress    InetAddress,
    isnsDdPortalMemberPortType   IsnsPortalPortTypeId,
    isnsDdPortalMemberPort       InetPortNumber,
    isnsDdPortalMemberIsRegistered TruthValue
}
```

```
isnsDdPortalMemberIndex    OBJECT-TYPE
    SYNTAX                  IsnsPortalIndexId
    MAX-ACCESS              not-accessible
    STATUS                   current
    DESCRIPTION
```

"The index for a portal explicitly contained in the discovery domain. This managed object, combined with isnsServerIndex and isnsDdId, is the key for this table."

```
REFERENCE "RFC4171, Section 6"
 ::= { isnsDdPortalMemberEntry 1 }
```

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```
isnsDdPortalMemberAddressType OBJECT-TYPE
    SYNTAX                  InetAddressType
    MAX-ACCESS              read-only
    STATUS                   current
    DESCRIPTION
```

"The type of Inet address in isnsDdPortalMemberAddress. If the address is specified, then it must be a valid unicast address and the value of this object must be ipv4(1), ipv6(2), ipv4z(3), or ipv6z(4); otherwise, then the value of this object is unknown(0), and the value of isnsDdPortalMemberAddress is the zero-length string."

```
 ::= { isnsDdPortalMemberEntry 2 }
```

```
isnsDdPortalMemberAddress  OBJECT-TYPE
    SYNTAX                  InetAddress
    MAX-ACCESS              read-only
```

STATUS current
DESCRIPTION
"The Inet Address for the portal. The format of this object is specified by isnsDdPortalMemberAddressType."
REFERENCE "[RFC4171, Section 6](#)"
::= { isnsDdPortalMemberEntry 3 }

isnsDdPortalMemberPortType OBJECT-TYPE
SYNTAX IsnsPortalPortTypeId
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The port type for the portal, either UDP or TCP."
REFERENCE "[RFC4171, Section 6](#)"
::= { isnsDdPortalMemberEntry 4 }

isnsDdPortalMemberPort OBJECT-TYPE
SYNTAX InetPortNumber (1 .. 65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The port number for the portal. Whether the portal type is TCP or UDP is indicated by isnsDdPortalMemberPortType."
REFERENCE "[RFC4171, Section 6](#)"
::= { isnsDdPortalMemberEntry 5 }

isnsDdPortalMemberIsRegistered OBJECT-TYPE
SYNTAX TruthValue
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"This indicates whether this member of the DD is currently registered in the iSNS Server instance. Portals that are DD members do not need to be currently registered in

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order for them to be added to a DD."
REFERENCE "[RFC4171, Section 6.11](#)"
::= { isnsDdPortalMemberEntry 6 }

--
-- DD FC Port Membership Assignment
--

isnsDdFcPortMemberTable OBJECT-TYPE
SYNTAX SEQUENCE OF
IsnsDdFcPortMemberEntry

```

MAX-ACCESS          not-accessible
STATUS              current
DESCRIPTION
"A table containing FC Port World Wide Names (WWN) that
have been assigned to specific DDs.  The number of rows
in the table is dependent on the number of relationships
between FC Ports and DDs registered in the iSNS."
 ::= { isnsDdInfo 4 }

```

```

isnsDdFcPortMemberEntry  OBJECT-TYPE
    SYNTAX                IsnsDdFcPortMemberEntry
    MAX-ACCESS            not-accessible
    STATUS                current
    DESCRIPTION
"The association of one FC Port with a Discovery Domain.
Membership of an FC Port in a Discovery Domain is
indicated by creating a row for the appropriate DD ID
and FC Port WWN."
    INDEX { isnsServerIndex,
            isnsDdId,
            isnsDdFcPortMemberPortName }
    ::= { isnsDdFcPortMemberTable 1 }

```

```

IsnsDdFcPortMemberEntry ::=
SEQUENCE {
    isnsDdFcPortMemberPortName FcNameIdOrZero,
    isnsDdFcPortMemberIsRegistered TruthValue
}

```

```

isnsDdFcPortMemberPortName  OBJECT-TYPE
    SYNTAX                FcNameIdOrZero (SIZE(8))
    MAX-ACCESS            not-accessible
    STATUS                current
    DESCRIPTION
"The Port WWN the FC Port that is a member of the DD.  The
value MUST be a valid FC WWN, as per the FC-GS standard.
This managed object, combined with the isnsServerIndex
and isnsDdId are the key for this table.  A zero-length
string is not a valid value for this managed object."
    REFERENCE "RFC4171, Section 6"
    ::= { isnsDdFcPortMemberEntry 1 }

```

```

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```

```

isnsDdFcPortMemberIsRegistered OBJECT-TYPE
    SYNTAX                TruthValue
    MAX-ACCESS            read-only
    STATUS                current

```

```

DESCRIPTION
"This indicates whether this member of the DD is currently
registered in the iSNS Server instance."
REFERENCE "RFC4171, Section 6.11"
 ::= { isnsDdFcPortMemberEntry 2 }

--
-- Registered Device Information
--

isnsReg      OBJECT IDENTIFIER ::= { isnsServerInfo 6 }

isnsRegEntityInfo      OBJECT IDENTIFIER
                        ::= { isnsReg      1 }

--
-- iSNS Registered Entities Table
--

isnsRegEntityTable      OBJECT-TYPE
    SYNTAX                SEQUENCE OF IsnsRegEntityEntry
    MAX-ACCESS            not-accessible
    STATUS                current
    DESCRIPTION
    "A table containing registered Entity objects in each iSNS
server instance.  The number of entries in the table is
dependent on the number of Entity objects registered in the
iSNS Server instances.  All Entity objects are registered in
the iSNS using the iSNS protocol."
    ::= { isnsRegEntityInfo 1 }

isnsRegEntityEntry      OBJECT-TYPE
    SYNTAX                IsnsRegEntityEntry
    MAX-ACCESS            not-accessible
    STATUS                current
    DESCRIPTION
    "Information on one registered Entity object in an iSNS
server instance."
    INDEX { isnsServerIndex,
            isnsRegEntityIndex }
    ::= { isnsRegEntityTable 1 }

IsnsRegEntityEntry ::=
    SEQUENCE {
        isnsRegEntityIndex      IsnsEntityIndexIdOrZero,
        isnsRegEntityEID        SnmpAdminString,
        isnsRegEntityProtocol    Unsigned32,

```

```

isnsRegEntityManagementAddressType
                                InetAddressType,
isnsRegEntityManagementAddress
                                InetAddress,
isnsRegEntityTimestamp         TimeStamp,
isnsRegEntityVersionMin        Unsigned32,
isnsRegEntityVersionMax        Unsigned32,
isnsRegEntityRegistrationPeriod
                                Unsigned32
    }

```

```

isnsRegEntityIndex             OBJECT-TYPE
    SYNTAX                      IsnsEntityIndexIdOrZero
                                ( 1 .. 4294967295 )
    MAX-ACCESS                  not-accessible
    STATUS                      current
    DESCRIPTION

```

"The Entity Index for this entity. This index is assigned by the iSNS Server when an Entity is initially registered. The Entity Index can be used to represent a registered Entity object in situations where the Entity EID would be too long/unwieldy. Zero is not a valid value for this object."

```

REFERENCE "RFC4171, Section 6"
 ::= { isnsRegEntityEntry 1 }

```

```

isnsRegEntityEID              OBJECT-TYPE
    SYNTAX                      SnmpAdminString
    MAX-ACCESS                  read-only
    STATUS                      current
    DESCRIPTION

```

"The EID is a unique registered Entity object identifier, as specified in the iSNS Specification. This is the iSNS Entity Identifier for the registered Entity object."

```

REFERENCE "RFC4171, Section 6"
 ::= { isnsRegEntityEntry 2 }

```

```

isnsRegEntityProtocol         OBJECT-TYPE
    SYNTAX                      Unsigned32 ( 1 .. 4294967295 )
    MAX-ACCESS                  read-only
    STATUS                      current
    DESCRIPTION

```

"The block storage protocol supported by this entity, as defined in the iSNS Specification, [Section 6.2.2](#). The following values are initially assigned.

Type	Value	Entity Type
-----	-----	-----
	1	No Protocol
	2	iSCSI
	3	iFCP

The full set of current Block Storage Protocols are specified in the IANA-maintained registry of assigned iSNS parameters. Please refer to [RFC4171](#) and the iSNS parameters maintained at IANA."

REFERENCE "[RFC4171, Section 6.2.2](#), and IANA Assignments"

::= { isnsRegEntityEntry 3 }

isnsRegEntityManagementAddressType OBJECT-TYPE

SYNTAX InetAddressType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The type of Inet address in isnsRegEntityManagementAddress. If the address is specified, then it must be a valid unicast address and the value of this object must be ipv4(1), ipv6(2), ipv4z(3), or ipv6z(4); otherwise, then the value of this object is unknown(0), and the value of isnsRegEntityManagementAddress is the zero-length string."

::= { isnsRegEntityEntry 4 }

isnsRegEntityManagementAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The iSNS Management IP Address for the registered Entity object. The format of this object is specified by isnsRegEntityManagementAddressType."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegEntityEntry 5 }

isnsRegEntityTimestamp OBJECT-TYPE

SYNTAX TimeStamp

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The iSNS Entity Registration Timestamp for the registered Entity object. This is the most recent date and time that the registered Entity object, and associated registered objects contained in the Entity, were registered or updated."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegEntityEntry 6 }

isnsRegEntityVersionMin OBJECT-TYPE
 SYNTAX Unsigned32 (0 .. 254 | 255)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The minimum version supported for the block storage protocol
 specified by isnsRegEntityProtocol. The protocol version

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specified can be from 1 to 254. A value of 255 is a wildcard
value, indicating no minimum version value has been specified
for this Entity. Entity registrations with an
isnsRegEntityProtocol of 'No Protocol' SHALL have an
isnsRegEntityVersionMin value of 0."
 REFERENCE "[RFC4171, Section 6.2.5](#)"
 ::= { isnsRegEntityEntry 7 }

isnsRegEntityVersionMax OBJECT-TYPE
 SYNTAX Unsigned32 (0 .. 254 | 255)
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The maximum version supported for the block storage protocol
 specified by isnsRegEntityProtocol. The protocol version
 specified can be from 1 to 254. A value of 255 is a wildcard
 value, indicating no maximum version value has been specified
 for this Entity. Entity registrations with an
 isnsRegEntityProtocol of 'No Protocol' SHALL have an
 isnsRegEntityVersionMax value of 0."
 REFERENCE "[RFC4171, Section 6.2.5](#)"
 ::= { isnsRegEntityEntry 8 }

isnsRegEntityRegistrationPeriod OBJECT-TYPE
 SYNTAX Unsigned32 (0 .. 4294967295)
 UNITS "seconds"
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The iSNS Entity Status Inquiry (ESI) registration period
 which indicates the maximum time, in seconds, that the
 registration will be maintained without receipt of an iSNSP
 message from the entity. If the Registration Period is set
 to 0, then the Entity SHALL NOT be deregistered due to no
 contact with the entity."
 REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegEntityEntry 9 }

-- Registered Objects Associated With an Entity Information
--

isnsRegEntityNumObjectsTable OBJECT-TYPE
SYNTAX SEQUENCE OF
IsnsRegEntityNumObjectsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"A table containing information on the number of registered objects associated with a registered Entity in the iSNS server instance. The number of entries in the table is dependent on the number of registered Entity objects in the

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iSNS."
 ::= { isnsRegEntityInfo 2 }

isnsRegEntityNumObjectsEntry OBJECT-TYPE
SYNTAX IsnsRegEntityNumObjectsEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"Information on the number of registered objects associated with a registered Entity object in an iSNS Server instance."

INDEX { isnsServerIndex,
 isnsRegEntityIndex }
 ::= { isnsRegEntityNumObjectsTable 1 }

IsnsRegEntityNumObjectsEntry ::=
SEQUENCE {
 isnsRegEntityInfoNumPortals Gauge32,
 isnsRegEntityInfoNumPortalGroups Gauge32,
 isnsRegEntityInfoNumIscsiNodes Gauge32,
 isnsRegEntityInfoNumFcPorts Gauge32,
 isnsRegEntityInfoNumFcNodes Gauge32
 }

isnsRegEntityInfoNumPortals OBJECT-TYPE
SYNTAX Gauge32 (0 .. 4294967295)
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The number of Portals associated with this Entity."
 ::= { isnsRegEntityNumObjectsEntry 1 }

isnsRegEntityInfoNumPortalGroups OBJECT-TYPE
SYNTAX Gauge32 (0 .. 4294967295)

MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of Portal Groups associated with this Entity."
 ::= { isnsRegEntityNumObjectsEntry 2 }

isnsRegEntityInfoNumIscsiNodes OBJECT-TYPE
SYNTAX Gauge32 (0 .. 4294967295)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of iSCSI Storage Nodes associated with this Entity."
 ::= { isnsRegEntityNumObjectsEntry 3 }

isnsRegEntityInfoNumFcPorts OBJECT-TYPE
SYNTAX Gauge32 (0 .. 4294967295)
MAX-ACCESS read-only
STATUS current

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DESCRIPTION
"The number of FC Ports associated with this Entity."
 ::= { isnsRegEntityNumObjectsEntry 4 }

isnsRegEntityInfoNumFcNodes OBJECT-TYPE
SYNTAX Gauge32 (0 .. 4294967295)
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The number of FC Nodes associated with this Entity."
 ::= { isnsRegEntityNumObjectsEntry 5 }

--
-- iSNS Registered Portal Information
--

isnsRegPortalInfo OBJECT IDENTIFIER
 ::= { isnsReg 2 }

--
-- iSNS Registered Portal Table
--

isnsRegPortalTable OBJECT-TYPE
SYNTAX SEQUENCE OF IsnsRegPortalEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"A table containing the registered Portals in the iSNS.
The number of entries is dependent on the number of
Portals registered in the iSNS."

::= { isnsRegPortalInfo 1 }

isnsRegPortalEntry OBJECT-TYPE
 SYNTAX IsnsRegPortalEntry
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"Information on one registered Entity Portal in the iSNS.
The Entity Index is part of the table index to quickly
find Portals that support a specific Entity."

 INDEX { isnsServerIndex,
 isnsRegEntityIndex,
 isnsRegPortalPortalIndex }
 ::= { isnsRegPortalTable 1 }

IsnsRegPortalEntry ::=

 SEQUENCE {
 isnsRegPortalPortalIndex IsnsPortalIndexId,
 isnsRegPortalAddressType InetAddressType,
 isnsRegPortalAddress InetAddress,
 isnsRegPortalPortType IsnsPortalPortTypeId,

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 isnsRegPortalPort InetPortNumber,
 isnsRegPortalSymbolicName SnmpAdminString,
 isnsRegPortalEsiInterval Unsigned32,
 isnsRegPortalEsiPortType IsnsPortalPortTypeId,
 isnsRegPortalEsiPort InetPortNumber,
 isnsRegPortalScnPortType IsnsPortalPortTypeId,
 isnsRegPortalScnPort InetPortNumber,
 isnsRegPortalSecurityInfo IsnsPortalSecurityType
 }

isnsRegPortalPortalIndex OBJECT-TYPE
 SYNTAX IsnsPortalIndexId
 MAX-ACCESS not-accessible
 STATUS current
 DESCRIPTION

"The index for this Entity Portal."

 REFERENCE "[RFC4171, Section 6](#)"

 ::= { isnsRegPortalEntry 1 }

isnsRegPortalAddressType OBJECT-TYPE
 SYNTAX InetAddressType
 MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The type of Inet address in isnsRegPortalAddress. If the address is specified, then it must be a valid unicast address and the value of this object must be ipv4(1), ipv6(2), ipv4z(3), or ipv6z(4); otherwise, then the value of this object is unknown(0), and the value of isnsRegPortalAddress is the zero-length string."

::= { isnsRegPortalEntry 2 }

isnsRegPortalAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Inet Address for this Portal as defined in the iSNS Specification, [RFC4171](#). The format of this object is specified by isnsRegPortalAddressType."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegPortalEntry 3 }

isnsRegPortalPortType OBJECT-TYPE

SYNTAX IsnsPortalPortTypeId

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The port type for this Portal, either UDP or TCP, as defined in the iSNS Specification, [RFC4171](#)."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegPortalEntry 4 }

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isnsRegPortalPort OBJECT-TYPE

SYNTAX InetPortNumber (1 .. 65535)

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The port number for this Portal as defined in the iSNS Specification, [RFC4171](#). Whether the Portal type is TCP or UDP is indicated by isnsRegPortalPortType."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegPortalEntry 5 }

isnsRegPortalSymbolicName OBJECT-TYPE

SYNTAX SnmpAdminString

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The Symbolic Name for this Portal as defined in the iSNS Specification, [RFC4171](#). If not provided then the string SHALL be zero-length."

REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegPortalEntry 6 }

isnsRegPortalEsiInterval OBJECT-TYPE
SYNTAX Unsigned32 (0 .. 65535)
UNITS "seconds"
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The Entity Status Inquiry (ESI) Interval for this Portal as defined in the iSNS Specification, [RFC4171](#). A value of 0 indicates that ESI monitoring has not be configured for this Portal."

REFERENCE "[RFC4171, Section 6.3.4](#)"
 ::= { isnsRegPortalEntry 7 }

isnsRegPortalEsiPortType OBJECT-TYPE
SYNTAX IsnsPortalPortTypeId
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The port type for the ESI Port, either UDP or TCP, as defined in the iSNS Specification, [RFC4171](#)."

REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegPortalEntry 8 }

isnsRegPortalEsiPort OBJECT-TYPE
SYNTAX InetPortNumber
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The TCP or UDP port number used for ESI monitoring. Whether

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the port type is TCP or UDP is indicated by isnsRegPortalEsiPortType. A value of 0 indicates that ESI monitoring is not enabled for this Portal."

REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegPortalEntry 9 }

isnsRegPortalScnPortType OBJECT-TYPE
SYNTAX IsnsPortalPortTypeId
MAX-ACCESS read-only
STATUS current

DESCRIPTION
 "The port type for the SCN Port, either UDP or TCP, as defined in the iSNS Specification, [RFC4171](#)."
 REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegPortalEntry 10 }

isnsRegPortalScnPort OBJECT-TYPE
 SYNTAX InetPortNumber
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The TCP or UDP port used to receive SCN messages from the iSNS Server. Whether the port type is TCP or UDP is indicated by isnsRegPortalScnPortType. A value of 0 indicates that SCN message receipt is not enabled for this Portal."
 REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegPortalEntry 11 }

isnsRegPortalSecurityInfo OBJECT-TYPE
 SYNTAX IsnsPortalSecurityType
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "Indicates security attribute settings for the Portal as registered in iSNS server. The bit for bitmapVALID must be set in order for this attribute to contain valid information. Setting a bit to 1 indicates the feature is enabled."
 REFERENCE "[RFC4171, Section 6.3.9](#)"
 ::= { isnsRegPortalEntry 12 }

--
 -- iSNS Registered Portal Group Information
 --

isnsRegPortalGroupInfo OBJECT IDENTIFIER
 ::= { isnsReg 3 }

--
 -- iSNS Registered Portal Group (PG) Table
 --

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isnsRegPgTable OBJECT-TYPE
 SYNTAX SEQUENCE OF IsnsRegPgEntry
 MAX-ACCESS not-accessible

```

        STATUS                current
        DESCRIPTION
        "A table containing the registered Portal Groups (PGs) in
        the iSNS Server instance. The number of entries is
        dependent on the number of Portal Groups registered in
        the iSNS."
        ::= { isnsRegPortalGroupInfo 1 }

isnsRegPgEntry                OBJECT-TYPE
    SYNTAX                    IsnsRegPgEntry
    MAX-ACCESS                not-accessible
    STATUS                    current
    DESCRIPTION
    "Information on one registered Portal Group in the iSNS
    server instance. The Entity Index is part of the table
    index to quickly find Portal Groups that support Portals
    and iSCSI Storage Nodes in a specific Entity."
    INDEX { isnsServerIndex,
            isnsRegEntityIndex,
            isnsRegPgIndex }
    ::= { isnsRegPgTable 1 }

IsnsRegPgEntry ::=
    SEQUENCE {
        isnsRegPgIndex          IsnsPortalGroupIndexId,
        isnsRegPgIscsiNodeIndex IsnsNodeIndexId,
        isnsRegPgIscsiName      SnmpAdminString,
        isnsRegPgPortalPortalIndex IsnsPortalIndexId,
        isnsRegPgPortalAddressType InetAddressType,
        isnsRegPgPortalAddress   InetAddress,
        isnsRegPgPortalPortType  IsnsPortalPortTypeId,
        isnsRegPgPortalPort      InetPortNumber,
        isnsRegPgPGT             IsnsPortalGroupTagIdOrNull
    }

isnsRegPgIndex                OBJECT-TYPE
    SYNTAX                    IsnsPortalGroupIndexId
    MAX-ACCESS                not-accessible
    STATUS                    current
    DESCRIPTION
    "The PG Index for this node. The index is created by the
    iSNS Server instance for uniquely identifying registered
    objects. The PG object is registered at the same time a
    Portal or Storage Node is registered using the iSNS
    protocol."
    REFERENCE "RFC4171, Section 6"
    ::= { isnsRegPgEntry 1 }

```

isnsRegPgIscsiNodeIndex OBJECT-TYPE
 SYNTAX IsnsNodeIndexId
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The index for the iSCSI Node associated with this PG.
 This index can be used to reference the
 isnsRegIscsiNodeTable."
 REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegPgEntry 2 }

isnsRegPgIscsiName OBJECT-TYPE
 SYNTAX SnmpAdminString (SIZE (0..223))
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The iSCSI Name of the initiator or target associated with
 the storage node. The iSCSI Name can not be longer than
 223 bytes. The iSNS Server internal maximum size is 224
 bytes to provide NULL termination. This is the PG iSCSI
 Name that uniquely identifies the iSCSI Storage Node that
 is associated with this PG."
 ::= { isnsRegPgEntry 3 }

isnsRegPgPortalPortalIndex OBJECT-TYPE
 SYNTAX IsnsPortalIndexId
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The Portal Index for the Portal associated with this PG.
 This index can be used to reference the isnsRegPortalTable."
 ::= { isnsRegPgEntry 4 }

isnsRegPgPortalAddressType OBJECT-TYPE
 SYNTAX InetAddressType
 MAX-ACCESS read-only
 STATUS current
 DESCRIPTION
 "The type of Inet address in isnsRegPgPortalAddress. If
 the address is specified, then it must be a valid unicast
 address and the value of this object must be ipv4(1),
 ipv6(2), ipv4z(3), or ipv6z(4); otherwise, then the value
 of this object is unknown(0), and the value of
 isnsRegPgPortalAddress is the zero-length string."
 ::= { isnsRegPgEntry 5 }

isnsRegPgPortalAddress OBJECT-TYPE
 SYNTAX InetAddress
 MAX-ACCESS read-only

STATUS current
DESCRIPTION
"The Inet Address for the Portal that is associated with
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the PG. The format of this object is specified by
isnsRegPgPortalAddressType."

REFERENCE "[RFC4171, Section 6](#)"
::= { isnsRegPgEntry 6 }

isnsRegPgPortalPortType OBJECT-TYPE
SYNTAX IsnsPortalPortTypeId
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The port type, either UDP or TCP, for the Portal that
is associated with this registered PG object."

REFERENCE "[RFC4171, Section 6](#)"
::= { isnsRegPgEntry 7 }

isnsRegPgPortalPort OBJECT-TYPE
SYNTAX InetPortNumber (1 .. 65535)
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The port number for the Portal that is associated with
this registered PG object. Whether the Portal type is
TCP or UDP is indicated by isnsRegPgPortalPortType."

REFERENCE "[RFC4171, Section 6](#)"
::= { isnsRegPgEntry 8 }

isnsRegPgPGT OBJECT-TYPE
SYNTAX IsnsPortalGroupIdOrNull
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The Portal Group Tag (PGT) for the registered iSCSI Portal
Group object in an iSNS Server instance. This indicates
the tag value that the Portal uses for access to the iSCSI
Storage Node. The PGT is used for coordinated access
between multiple Portals, as described in the iSCSI
Specification, [RFC3720](#). A PGT with no association is a
NULL value. The value of -1 indicates a NULL value."

REFERENCE "[RFC4171, Section 6](#), and [RFC3720](#)"
::= { isnsRegPgEntry 9 }

--
-- iSNS Registered iSCSI Node Information

```

--
isnsRegIscsiNodeInfo OBJECT IDENTIFIER ::= { isnsReg 4 }
--
-- iSNS Registered iSCSI Node Table
--

isnsRegIscsiNodeTable OBJECT-TYPE
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SYNTAX SEQUENCE OF IsnsRegIscsiNodeEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table containing the registered iSCSI Nodes in the iSNS
server instance. Storage devices register using the iSNS
protocol. While a device cannot be registered in an iSNS
server using SNMP, an entry can be deleted in order to
remove 'stale' entries. The number of entries is related
to the number of iSCSI nodes registered in the iSNS."
 ::= { isnsRegIscsiNodeInfo 1 }

isnsRegIscsiNodeEntry OBJECT-TYPE
SYNTAX IsnsRegIscsiNodeEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Information on one iSCSI node that has been registered in
the iSNS Server instance. New rows cannot be added using
SNMP."
INDEX { isnsServerIndex,
        isnsRegEntityIndex,
        isnsRegIscsiNodeIndex }
 ::= { isnsRegIscsiNodeTable 1 }

IsnsRegIscsiNodeEntry ::= SEQUENCE {
    isnsRegIscsiNodeIndex IsnsNodeIndexId,
    isnsRegIscsiNodeName SnmpAdminString,
    isnsRegIscsiNodeType IsnsIscsiNodeType,
    isnsRegIscsiNodeAlias SnmpAdminString,
    isnsRegIscsiNodeScnTypes IsnsIscsiScnType,
    isnsRegIscsiNodeWwnToken FcNameIdOrZero,
    isnsRegIscsiNodeAuthMethod SnmpAdminString
}

isnsRegIscsiNodeIndex OBJECT-TYPE
SYNTAX IsnsNodeIndexId

```

```

MAX-ACCESS          not-accessible
STATUS              current
DESCRIPTION
"The index for this iSCSI node."
REFERENCE "RFC4171, Section 6"
 ::= { isnsRegIscsiNodeEntry 1 }

isnsRegIscsiNodeName      OBJECT-TYPE
SYNTAX                 SnmpAdminString (SIZE (0..223))
MAX-ACCESS             read-only
STATUS                 current
DESCRIPTION
"The iSCSI Name of the initiator or target associated with
the storage node. The iSCSI Name can not be longer than
223 bytes. The iSNS Server internal maximum size is 224

```

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```

bytes to provide NULL termination. This is the iSCSI Name
that uniquely identifies the initiator, initiator/target,
target, or control node in the network."
REFERENCE "RFC4171, Section 6"
 ::= { isnsRegIscsiNodeEntry 2 }

```

```

isnsRegIscsiNodeType      OBJECT-TYPE
SYNTAX                 IsnsIscsiNodeType
MAX-ACCESS             read-only
STATUS                 current
DESCRIPTION
"The Node Type defining the functions of this iSCSI node."
 ::= { isnsRegIscsiNodeEntry 3 }

```

```

isnsRegIscsiNodeAlias     OBJECT-TYPE
SYNTAX                 SnmpAdminString
MAX-ACCESS             read-only
STATUS                 current
DESCRIPTION
"The Alias name of the iSCSI node. This is a variable-length
text-based description of up to 255 bytes."
REFERENCE "RFC4171, Section 6"
 ::= { isnsRegIscsiNodeEntry 4 }

```

```

isnsRegIscsiNodeScnTypes  OBJECT-TYPE
SYNTAX                 IsnsIscsiScnType
MAX-ACCESS             read-only
STATUS                 current
DESCRIPTION
"The State Change Notification (SCN) types enabled for this
iSCSI node."

```

REFERENCE "[RFC4171, Section 6.4.4](#)"

::= { isnsRegIscsiNodeEntry 5 }

isnsRegIscsiNodeWwnToken OBJECT-TYPE
SYNTAX FcNameIdOrZero
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"This contains a globally unique 64-bit integer value that can be used to represent the World Wide Node Name of the iSCSI device in a Fibre Channel fabric. This identifier is used during the device registration process, and MUST conform to the requirements in [RFC4171](#). A zero-length string for this managed object indicates that a Node WWN token has not been assigned."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegIscsiNodeEntry 6 }

isnsRegIscsiNodeAuthMethod OBJECT-TYPE
SYNTAX SnmpAdminString
MAX-ACCESS read-only

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STATUS current

DESCRIPTION

"This attribute contains a null-terminated string containing UTF-8 text listing the iSCSI authentication methods enabled for this iSCSI Node, in order of preference. The text values used to identify iSCSI authentication methods are embedded in this string attribute and delineated by a comma. The text values are identical to those found in [RFC3720](#) - iSCSI. Additional vendor-specific text values are also possible."

REFERENCE "[RFC4171, Section 6](#), and [RFC3720](#)"

::= { isnsRegIscsiNodeEntry 7 }

--

-- iSNS Registered FC Node Information

--

isnsRegFcNodeInfo OBJECT IDENTIFIER ::= { isnsReg 5 }

--

-- iSNS Registered FC Node Table

--

isnsRegFcNodeTable OBJECT-TYPE
SYNTAX SEQUENCE OF IsnsRegFcNodeEntry

MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"A table containing the registered FC Nodes in the iSNS.
This supports iFCP as defined in [RFC4172](#)."
 ::= { isnsRegFcNodeInfo 1 }

isnsRegFcNodeEntry OBJECT-TYPE
SYNTAX IsnsRegFcNodeEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"Information on one registered FC node that has been
registered in the iSNS."
INDEX { isnsServerIndex,
 isnsRegFcNodeWwnn }
 ::= { isnsRegFcNodeTable 1 }

IsnsRegFcNodeEntry ::= SEQUENCE {
 isnsRegFcNodeWwnn FcNameIdOrZero,
 isnsRegFcNodeSymbolicName SnmpAdminString,
 isnsRegFcNodeAddressType InetAddressType,
 isnsRegFcNodeAddress InetAddress,
 isnsRegFcNodeIPA OCTET STRING,
 isnsRegFcNodeProxyIscsiName SnmpAdminString,
 isnsRegFcNodeNumFcPorts Gauge32
 }

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isnsRegFcNodeWwnn OBJECT-TYPE
SYNTAX FcNameIdOrZero (SIZE(8))
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION
"The FC Node World Wide Node Name as defined in the iSNS
Specification, [RFC4171](#). A zero-length string is not valid
for this managed object."
REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegFcNodeEntry 1 }

isnsRegFcNodeSymbolicName OBJECT-TYPE
SYNTAX SnmpAdminString
MAX-ACCESS read-only
STATUS current
DESCRIPTION
"The FC Node Symbolic Name of the node as defined in the
iSNS Specification, [RFC4171](#). This is a variable-length

text-based description. If not provided then the string SHALL be zero-length."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcNodeEntry 2 }

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

"The type of Inet address in isnsRegFcNodeAddress. If the address is specified, then it must be a valid unicast address and the value of this object must be ipv4(1), ipv6(2), ipv4z(3), or ipv6z(4); otherwise, then the value of this object is unknown(0), and the value of isnsRegFcNodeAddress is the zero-length string."

::= { isnsRegFcNodeEntry 3 }

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

"The FC Node Inet address of the node as defined in the iSNS Specification, [RFC4171](#). The format of this object is specified by isnsRegFcNodeAddressType."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcNodeEntry 4 }

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

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DESCRIPTION

"This managed object identifies the FC Initial Process Associator of the node as defined in the iSNS Specification, [RFC4171](#)."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcNodeEntry 5 }

isnsRegFcNodeProxyIscsiName OBJECT-TYPE
SYNTAX SnmpAdminString (SIZE (0..223))
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The iSCSI Name used to represent the FC Node in the IP

network. It is used as a pointer to the matching iSCSI Name entry in the iSNS Server. Its value is usually registered by an FC-iSCSI gateway connecting the IP network to the fabric containing the FC device."

REFERENCE "[RFC4171, Section 6](#)"
 ::= { isnsRegFcNodeEntry 6 }

isnsRegFcNodeNumFcPorts OBJECT-TYPE
SYNTAX Gauge32 (0 .. 4294967295)
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The number of FC Ports associated with this FC Node."
 ::= { isnsRegFcNodeEntry 7 }

--
-- iSNS Registered FC Port Table
--

isnsRegFcPortTable OBJECT-TYPE
SYNTAX SEQUENCE OF IsnsRegFcPortEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"Information on registered FC N_Ports in the iSNS. FC Ports are associated with registered FC Nodes. This supports iFCP as defined in [RFC4172](#)."

REFERENCE "[RFC4172, Section 4](#)"
 ::= { isnsRegFcNodeInfo 2 }

isnsRegFcPortEntry OBJECT-TYPE
SYNTAX IsnsRegFcPortEntry
MAX-ACCESS not-accessible
STATUS current
DESCRIPTION

"Information on one FC Port that has been registered in iSNS."

REFERENCE "[RFC4172, Section 4](#)"
 INDEX { isnsServerIndex,

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isnsRegEntityIndex,
isnsRegFcPortWwpn }
 ::= { isnsRegFcPortTable 1 }

IsnsRegFcPortEntry ::= SEQUENCE {
isnsRegFcPortWwpn FcNameIdOrZero,
isnsRegFcPortID FcAddressIdOrZero,

```

isnsRegFcPortType           Unsigned32,
isnsRegFcPortSymbolicName   SnmpAdminString,
isnsRegFcPortFabricPortWwn  FcNameIdOrZero,
isnsRegFcPortHA             FcAddressIdOrZero,
isnsRegFcPortAddressType    InetAddressType,
isnsRegFcPortAddress         InetAddress,
isnsRegFcPortFcCos          IsnsFcClassOfServiceType,
isnsRegFcPortFc4Types       OCTET STRING,
isnsRegFcPortFc4Descr       SnmpAdminString,
isnsRegFcPortFc4Features    OCTET STRING,
isnsRegFcPortScnTypes       IsnsIfcpScnType,
isnsRegFcPortRole           IsnsFcPortRoleType,
isnsRegFcPortFcNodeWwn      FcNameIdOrZero,
isnsRegFcPortPpnWwn         FcNameIdOrZero
                                }

```

```

isnsRegFcPortWwpn          OBJECT-TYPE
    SYNTAX                   FcNameIdOrZero (SIZE(8))
    MAX-ACCESS                not-accessible
    STATUS                     current
    DESCRIPTION

```

"The FC Port's World Wide Port Name as defined in the iSNS Specification, [RFC4171](#). A zero-length string is not valid for this managed object."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcPortEntry 1 }

```

isnsRegFcPortID            OBJECT-TYPE
    SYNTAX                   FcAddressIdOrZero
    MAX-ACCESS                read-only
    STATUS                     current
    DESCRIPTION

```

"The FC Port's Port ID as defined in the iSNS Specification, [RFC4171](#)."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcPortEntry 2 }

```

isnsRegFcPortType          OBJECT-TYPE
    SYNTAX                   Unsigned32 ( 0 .. 65535 )
    MAX-ACCESS                read-only
    STATUS                     current
    DESCRIPTION

```

"The FC Port Port Type as defined in the iSNS Specification, [RFC4171](#), and the Fibre Channel Generic Services Specification. Current values are as shown below:

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unknown (0),

```

nPort      (1),
nlPort     (2),
fnlPort    (3),
fPort      (129), -- x'81'
flPort     (130), -- x'82'
ePort      (132), -- x'84'
bPort      (133), -- x'85'
mFcpPort   (65297), -- x'FF11'
iFcpPort   (65298), -- x'FF12'
unknownEnd (65535)

```

The future assignment of any additional values will be documented in a revision of [RFC4171](#)."

```

REFERENCE "RFC4171, Section 6.6.3"
::= { isnsRegFcPortEntry 3 }

```

```

isnsRegFcPortSymbolicName OBJECT-TYPE
    SYNTAX          SnmpAdminString
    MAX-ACCESS      read-only
    STATUS           current
    DESCRIPTION

```

"The FC Port Port Symbolic Name as defined in the iSNS Specification, [RFC4171](#). If not provided then the string SHALL be zero-length."

```

REFERENCE "RFC4171, Section 6"
::= { isnsRegFcPortEntry 4 }

```

```

isnsRegFcPortFabricPortWwn OBJECT-TYPE
    SYNTAX          FcNameIdOrZero
    MAX-ACCESS      read-only
    STATUS           current
    DESCRIPTION

```

"The Fabric Port WWN for this entry as defined in the iSNS Specification, [RFC4171](#). A zero-length string for this managed object indicates that the Fabric Port WWN is not known, or has not yet been registered with the iSNS Server."

```

REFERENCE "RFC4171, Section 6"
::= { isnsRegFcPortEntry 5 }

```

```

isnsRegFcPortHA          OBJECT-TYPE
    SYNTAX          FcAddressIdOrZero
    MAX-ACCESS      read-only
    STATUS           current
    DESCRIPTION

```

"The FC Port Hard Address as defined in the iSNS Specification, [RFC4171](#)."

```

REFERENCE "RFC4171, Section 6"
::= { isnsRegFcPortEntry 6 }

```

```

isnsRegFcPortAddressType OBJECT-TYPE
    SYNTAX          InetAddressType
    MAX-ACCESS      read-only

```

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STATUS current

DESCRIPTION

"The type of Inet address in isnsRegFcPortAddress. If the address is specified, then it must be a valid unicast address and the value of this object must be ipv4(1), ipv6(2), ipv4z(3), or ipv6z(4); otherwise, then the value of this object is unknown(0), and the value of isnsRegFcPortAddress is the zero-length string."

::= { isnsRegFcPortEntry 7 }

isnsRegFcPortAddress OBJECT-TYPE

SYNTAX InetAddress

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The FC Port Inet Address as defined in the iSNS Specification, [RFC4171](#). The format of this object is specified by isnsRegFcPortAddressType."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcPortEntry 8 }

isnsRegFcPortFcCos OBJECT-TYPE

SYNTAX IsnsFcClassOfServiceType

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The FC Port Class of Service as defined in the iSNS Specification, [RFC4171](#)."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcPortEntry 9 }

isnsRegFcPortFc4Types OBJECT-TYPE

SYNTAX OCTET STRING (SIZE (32))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The FC Port FC-4 Types as defined in the iSNS Specification, [RFC4171](#)."

REFERENCE "[RFC4171, Section 6.6.9](#)"

::= { isnsRegFcPortEntry 10 }

isnsRegFcPortFc4Descr OBJECT-TYPE

SYNTAX SnmpAdminString (SIZE(4..255))

MAX-ACCESS read-only

STATUS current

DESCRIPTION

"The FC Port FC-4 Descriptor as defined in the iSNS Specification, [RFC4171](#). The FC-4 Descriptor can not be longer than 255 bytes. The iSNS Server internal maximum size is 256 bytes to provide NULL termination."

REFERENCE "[RFC4171, Section 6.6.10](#)"
::= { isnsRegFcPortEntry 11 }

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isnsRegFcPortFc4Features OBJECT-TYPE
SYNTAX OCTET STRING (SIZE (128))
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The FC Port FC-4 Features as defined in the iSNS Specification, [RFC4171](#)."

REFERENCE "[RFC4171, Section 6.6.11](#)"
::= { isnsRegFcPortEntry 12 }

isnsRegFcPortScnTypes OBJECT-TYPE
SYNTAX IsnsIfcpScnType
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The iFCP State Change Notification (SCN) types enabled for the registered object."

REFERENCE "[RFC4171, Section 6](#)"
::= { isnsRegFcPortEntry 13 }

isnsRegFcPortRole OBJECT-TYPE
SYNTAX IsnsFcPortRoleType
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The FC Port Role defines the role of the registered object."

REFERENCE "[RFC4171, Section 6](#)"
::= { isnsRegFcPortEntry 14 }

isnsRegFcPortFcNodeWwn OBJECT-TYPE
SYNTAX FcNameIdOrZero
MAX-ACCESS read-only
STATUS current
DESCRIPTION

"The FC Node World Wide Node Name that is associated with this FC Port as defined in the iSNS Specification, [RFC4171](#). This managed object may contain a zero-length string prior to a device registering this value with the iSNS Server."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcPortEntry 15 }

isnsRegFcPortPpnWwn OBJECT-TYPE
SYNTAX FcNameIdOrZero
MAX-ACCESS read-only
STATUS current

DESCRIPTION

"The Permanent Port Name attribute is the FC Port Name WWPN of the first Storage Node registered in the iSNS Database that is associated with a particular FC Device (FC Node). The PPN of all subsequent Storage Node registrations that

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are associated with that FC Device (FC Node) SHALL be set to the FC Port Name WWPN of the first Storage Node, as defined in the iSNS Specification, [RFC4171](#). This managed object may contain a zero-length string prior to a device registering this value with the iSNS Server."

REFERENCE "[RFC4171, Section 6](#)"

::= { isnsRegFcPortEntry 16 }

--
-- Mapping from FC Node to Entity - FC Port
--

isnsRegFcNodePortTable OBJECT-TYPE
SYNTAX SEQUENCE OF
 IsnsRegFcNodePortEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"A table containing the mapping of a registered FC Node and associated registered iFCP Port to the supporting registered Entity object in an iSNS Server instance."

::= { isnsRegFcNodeInfo 3 }

isnsRegFcNodePortEntry OBJECT-TYPE
SYNTAX IsnsRegFcNodePortEntry
MAX-ACCESS not-accessible
STATUS current

DESCRIPTION

"Information on one mapping from an FC Node and iFCP Port to an Entity object registered in an iSNS."

INDEX { isnsServerIndex,
 isnsRegFcNodeWwnn,
 isnsRegFcPortWwpn }

::= { isnsRegFcNodePortTable 1 }

```
IsnsRegFcNodePortEntry ::= SEQUENCE {
    isnsRegFcNodePortEntityIndex IsnsEntityIndexIdOrZero
}
```

```
isnsRegFcNodePortEntityIndex OBJECT-TYPE
    SYNTAX          IsnsEntityIndexIdOrZero
    MAX-ACCESS      read-only
    STATUS          current
    DESCRIPTION
```

```
"The Entity Index for the registered Entity object
associated with the FC Port and FC Node. This managed
object may contain the value of zero prior to a device
registering this value with the iSNS Server."
```

```
::= { isnsRegFcNodePortEntry 1 }
```

```
--
```

```
-- iSNS Notifications Information -----
```

```
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```

```
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```

```
--
```

```
isnsNotificationsInfo      OBJECT IDENTIFIER
                             ::= { isnsObjects 2 }
```

```
isnsInstanceInfo          OBJECT-TYPE
    SYNTAX          SnmpAdminString
    MAX-ACCESS      accessible-for-notify
    STATUS          current
    DESCRIPTION
```

```
"Textual information about the notification event and the
iSNS Server generating the notification. An example is:
iSNS Server Started."
```

```
::= { isnsNotificationsInfo 1 }
```

```
isnsAddressNotificationType OBJECT-TYPE
    SYNTAX          InetAddressType
    MAX-ACCESS      accessible-for-notify
    STATUS          current
    DESCRIPTION
```

```
"The type of Inet address in isnsAddressNotification. If
the address is specified, then it must be a valid unicast
address and the value of this object must be ipv4(1),
ipv6(2), ipv4z(3), or ipv6z(4); otherwise, then the value
of this object is unknown(0), and the value of
isnsAddressNotification is the zero-length string."
```

```
::= { isnsNotificationsInfo 2 }
```

```
isnsAddressNotification    OBJECT-TYPE
```

SYNTAX InetAddress
MAX-ACCESS accessible-for-notify
STATUS current
DESCRIPTION

"Identifies the IP address of the iSNS Server. The format of this object is specified by isnsAddressNotificationType. The IP address will always be specified in the notification unless an error causes the IP address to not be known."

::= { isnsNotificationsInfo 3 }

isnsTcpPortNotification OBJECT-TYPE
SYNTAX InetPortNumber
MAX-ACCESS accessible-for-notify
STATUS current
DESCRIPTION

"Indicates the TCP port the iSNS Server is using, or 0 if TCP based registrations are not supported."

::= { isnsNotificationsInfo 4 }

isnsUdpPortNotification OBJECT-TYPE
SYNTAX InetPortNumber
MAX-ACCESS accessible-for-notify
STATUS current

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DESCRIPTION

"Indicates the UDP port the iSNS Server is using, or 0 if UDP based registrations are not supported."

::= { isnsNotificationsInfo 5 }

--
-- iSNS Notification Block -----
--

isnsServerStart NOTIFICATION-TYPE
OBJECTS {
 isnsInstanceInfo,
 isnsAddressNotificationType,
 isnsAddressNotification,
 isnsTcpPortNotification,
 isnsUdpPortNotification
 }
STATUS current
DESCRIPTION

"This notification is sent when an iSNS Server begins operation. The notification provides the following:
 isnsInstanceInfo : iSNS Server textual information
 isnsAddressTypeNotification : iSNS Server address type

```

        isnsAddressNotification : iSNS Server address
        isnsTcpPortNotification : iSNS Server TCP Port
        isnsUdpPortNotification : iSNS Server UDP Port
    "
    ::= { isnsNotifications 1 }

isnsServerShutdown          NOTIFICATION-TYPE
    OBJECTS {
        isnsInstanceInfo,
        isnsAddressNotificationType,
        isnsAddressNotification,
        isnsTcpPortNotification,
        isnsUdpPortNotification
    }
    STATUS                    current
    DESCRIPTION
    "This notification is sent when an iSNS Server is
    shutdown.  The notification provides the following:
        isnsInstanceInfo : iSNS Server textual information
        isnsAddressTypeNotification : iSNS Server address type
        isnsAddressNotification : iSNS Server address
        isnsTcpPortNotification : iSNS Server TCP Port
        isnsUdpPortNotification : iSNS Server UDP Port
    "
    ::= { isnsNotifications 2 }

```

```

-----
--
-- Compliance Information

```

```

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```

```

--
isnsCompliances OBJECT IDENTIFIER ::= { isnsConformance 1 }

```

```

isnsIscsiServerCompliance MODULE-COMPLIANCE
    STATUS                    current
    DESCRIPTION
    "Initial compliance statement for an iSNS Server
    providing support to iSCSI clients."
    MODULE                    -- this module
    MANDATORY-GROUPS {
        isnsServerAttributesGroup,
        isnsServerIscsiControlNodeGroup,
        isnsServerIscsiDdsDdObjGroup,
        isnsServerRegIscsiObjGroup,
        isnsServerNumObjectsGroup,
        isnsNotificationsObjGroup,
    }

```

```
        isnsServerNotificationGroup
        }
OBJECT isnsServerDiscoveryMcGroupType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z
is required."
```

```
OBJECT isnsServerDiscoveryMcGroupAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z
and their related SIZE need to be supported."
```

```
OBJECT isnsDdPortalMemberAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z
is required."
```

```
OBJECT isnsDdPortalMemberAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z
and their related SIZE need to be supported."
```

```
OBJECT isnsRegEntityManagementAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z
is required."
```

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```
OBJECT isnsRegEntityManagementAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z
and their related SIZE need to be supported."
```

```
OBJECT isnsRegPortalAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z
```

is required."

```
OBJECT isnsRegPortalAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
```

"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z and their related SIZE need to be supported."

```
OBJECT isnsRegPgPortalAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
```

"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z is required."

```
OBJECT isnsRegPgPortalAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
```

"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z and their related SIZE need to be supported."

```
OBJECT isnsAddressNotificationType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
```

"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z is required."

```
OBJECT isnsAddressNotification
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
```

"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z and their related SIZE need to be supported."
 ::= { isnsCompliances 1 }

isnsIfcpServerCompliance MODULE-COMPLIANCE

```
STATUS current
```

```
DESCRIPTION
```

"Initial compliance statement for an iSNS Server providing support to iFCP Clients."

```
MODULE -- this module
```

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```
MANDATORY-GROUPS {
    isnsServerAttributesGroup,
    isnsServerIfcpPortControlNodeGroup,
    isnsServerIfcpDdsDdObjGroup,
    isnsServerRegIfcpObjGroup,
```

```

        isnsServerNumObjectsGroup,
        isnsNotificationsObjGroup,
        isnsServerNotificationGroup
    }
OBJECT isnsServerDiscoveryMcGroupType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z
is required."

OBJECT isnsServerDiscoveryMcGroupAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z
and their related SIZE need to be supported."

OBJECT isnsDdPortalMemberAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z
is required."

OBJECT isnsDdPortalMemberAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z
and their related SIZE need to be supported."

OBJECT isnsRegEntityManagementAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION
"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z
is required."

OBJECT isnsRegEntityManagementAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20 ))
DESCRIPTION
"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z
and their related SIZE need to be supported."

OBJECT isnsRegPortalAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
                        ipv4z(3), ipv6z(4) }
DESCRIPTION

```

"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z is required."

OBJECT isnsRegPortalAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20))
DESCRIPTION

"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z and their related SIZE need to be supported."

OBJECT isnsRegFcNodeAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
ipv4z(3), ipv6z(4) }

DESCRIPTION

"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z is required."

OBJECT isnsRegFcNodeAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20))
DESCRIPTION

"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z and their related SIZE need to be supported."

OBJECT isnsRegFcPortAddressType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
ipv4z(3), ipv6z(4) }

DESCRIPTION

"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z is required."

OBJECT isnsRegFcPortAddress
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20))
DESCRIPTION

"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z and their related SIZE need to be supported."

OBJECT isnsAddressNotificationType
SYNTAX InetAddressType { unknown(0), ipv4(1), ipv6(2),
ipv4z(3), ipv6z(4) }

DESCRIPTION

"Only support for unknown, ipv4, ipv6, ipv4z, ipv6z is required."

OBJECT isnsAddressNotification
SYNTAX InetAddress (SIZE (0 | 4 | 8 | 16 | 20))
DESCRIPTION

"Only addresses for unknown, ipv4, ipv6, ipv4z, ipv6z and their related SIZE need to be supported."

::= { isnsCompliances 2 }

isnsGroups OBJECT IDENTIFIER ::= { isnsConformance 2 }

isnsServerAttributesGroup OBJECT-GROUP

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```
OBJECTS {
    isnsServerName,
    isnsServerIsnsVersion,
    isnsServerVendorInfo,
    isnsServerPhysicalIndex,
    isnsServerTcpPort,
    isnsServerUdpPort,
    isnsServerDiscontinuityTime,
    isnsServerRole,
    isnsServerDiscoveryMethodsEnabled,
    isnsServerDiscoveryMcGroupType,
    isnsServerDiscoveryMcGroupAddress,
    isnsServerEsiNonResponseThreshold,
    isnsServerEnableControlNodeMgtScn,
    isnsServerDefaultDdDdsStatus,
    isnsServerUpdateDdDdsSupported,
    isnsServerUpdateDdDdsEnabled
}
STATUS                      current
DESCRIPTION
"iSNS Server attributes."
 ::= { isnsGroups 1 }
```

isnsServerNumObjectsGroup OBJECT-GROUP

```
OBJECTS {
    isnsNumDds,
    isnsNumDd,
    isnsNumEntities,
    isnsNumPortals,
    isnsNumPortalGroups,
    isnsNumIscsiNodes,
    isnsNumFcPorts,
    isnsNumFcNodes,
    isnsRegEntityInfoNumPortals,
    isnsRegEntityInfoNumPortalGroups,
    isnsRegEntityInfoNumIscsiNodes,
    isnsRegEntityInfoNumFcPorts,
    isnsRegEntityInfoNumFcNodes
}
STATUS                      current
DESCRIPTION
"Managed objects indicating the number of registered objects
in an iSNS Server or the number of registered objects
associated with a registered Entity. These managed objects
are optional to implement."
```

::= { isnsGroups 2 }

isnsServerIscsiControlNodeGroup OBJECT-GROUP
 OBJECTS {
 isnsControlNodeIscsiNodeName,
 isnsControlNodeIscsiIsRegistered,
 isnsControlNodeIscsiRcvMgtSCN

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 }
 STATUS current
 DESCRIPTION
 "iSNS Server iSCSI control node managed objects."
 ::= { isnsGroups 3 }

isnsServerIfcpPortControlNodeGroup OBJECT-GROUP
 OBJECTS {
 isnsControlNodeFcPortIsRegistered,
 isnsControlNodeFcPortRcvMgtSCN
 }

STATUS current
 DESCRIPTION
 "iSNS Server iFCP Port control node managed objects."
 ::= { isnsGroups 4 }

isnsServerIscsiDdsDdObjGroup OBJECT-GROUP
 OBJECTS {
 isnsDdsSymbolicName,
 isnsDdsStatus,
 isnsDdsMemberSymbolicName,
 isnsDdSymbolicName,
 isnsDdFeatures,
 isnsDdIscsiMemberName,
 isnsDdIscsiMemberIsRegistered,
 isnsDdPortalMemberAddressType,
 isnsDdPortalMemberAddress,
 isnsDdPortalMemberPortType,
 isnsDdPortalMemberPort,
 isnsDdPortalMemberIsRegistered
 }

STATUS current
 DESCRIPTION
 "iSNS Server DDS and DD managed objects for iSCSI."
 ::= { isnsGroups 5 }

isnsServerIfcpDdsDdObjGroup OBJECT-GROUP
 OBJECTS {
 isnsDdsSymbolicName,

```

        isnsDdsStatus,
        isnsDdSymbolicName,
        isnsDdFeatures,
        isnsDdPortalMemberAddressType,
        isnsDdPortalMemberAddress,
        isnsDdPortalMemberPortType,
        isnsDdPortalMemberPort,
        isnsDdPortalMemberIsRegistered,
        isnsDdFcPortMemberIsRegistered
    }
    STATUS          current
    DESCRIPTION
    "iSNS Server DDS and DD managed objects for iFCP."

```

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```
 ::= { isnsGroups 6 }
```

```

isnsServerRegIscsiObjGroup OBJECT-GROUP
OBJECTS {
    isnsRegEntityEID,
    isnsRegEntityProtocol,
    isnsRegEntityManagementAddressType,
    isnsRegEntityManagementAddress,
    isnsRegEntityTimestamp,
    isnsRegEntityVersionMin,
    isnsRegEntityVersionMax,
    isnsRegEntityRegistrationPeriod,
    isnsRegEntityInfoNumPortals,
    isnsRegEntityInfoNumPortalGroups,
    isnsRegEntityInfoNumIscsiNodes,
    isnsRegEntityInfoNumFcPorts,
    isnsRegEntityInfoNumFcNodes,
    isnsRegPortalAddressType,
    isnsRegPortalAddress,
    isnsRegPortalPortType,
    isnsRegPortalPort,
    isnsRegPortalSymbolicName,
    isnsRegPortalEsiInterval,
    isnsRegPortalEsiPortType,
    isnsRegPortalEsiPort,
    isnsRegPortalScnPortType,
    isnsRegPortalScnPort,
    isnsRegPortalSecurityInfo,
    isnsRegPgIscsiNodeIndex,
    isnsRegPgIscsiName,
    isnsRegPgPortalPortalIndex,
    isnsRegPgPortalAddressType,
    isnsRegPgPortalAddress,

```

```

        isnsRegPgPortalPortType,
        isnsRegPgPortalPort,
        isnsRegPgPGT,
        isnsRegIscsiNodeName,
        isnsRegIscsiNodeType,
        isnsRegIscsiNodeAlias,
        isnsRegIscsiNodeScnTypes,
        isnsRegIscsiNodeWwnToken,
        isnsRegIscsiNodeAuthMethod
    }
    STATUS current
    DESCRIPTION
    "iSNS Server registered iSCSI managed objects."
    ::= { isnsGroups 7 }

```

```

isnsServerRegIfcpObjGroup OBJECT-GROUP
OBJECTS {
    isnsRegEntityEID,
    isnsRegEntityProtocol,

```

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```

    isnsRegEntityManagementAddressType,
    isnsRegEntityManagementAddress,
    isnsRegEntityTimestamp,
    isnsRegEntityVersionMin,
    isnsRegEntityVersionMax,
    isnsRegEntityRegistrationPeriod,
    isnsRegEntityInfoNumPortals,
    isnsRegEntityInfoNumPortalGroups,
    isnsRegEntityInfoNumIscsiNodes,
    isnsRegEntityInfoNumFcPorts,
    isnsRegEntityInfoNumFcNodes,
    isnsRegPortalAddressType,
    isnsRegPortalAddress,
    isnsRegPortalPortType,
    isnsRegPortalPort,
    isnsRegPortalSymbolicName,
    isnsRegPortalEsiInterval,
    isnsRegPortalEsiPortType,
    isnsRegPortalEsiPort,
    isnsRegPortalScnPortType,
    isnsRegPortalScnPort,
    isnsRegPortalSecurityInfo,
    isnsRegFcPortID,
    isnsRegFcPortType,
    isnsRegFcPortSymbolicName,
    isnsRegFcPortFabricPortWwn,
    isnsRegFcPortHA,

```

```

    isnsRegFcPortAddressType,
    isnsRegFcPortAddress,
    isnsRegFcPortFcCos,
    isnsRegFcPortFc4Types,
    isnsRegFcPortFc4Descr,
    isnsRegFcPortFc4Features,
    isnsRegFcPortScnTypes,
    isnsRegFcPortRole,
    isnsRegFcPortFcNodeWwnn,
    isnsRegFcPortPpnWwn,
    isnsRegFcNodeSymbolicName,
    isnsRegFcNodeAddressType,
    isnsRegFcNodeAddress,
    isnsRegFcNodeIPA,
    isnsRegFcNodeProxyIscsiName,
    isnsRegFcNodeNumFcPorts,
    isnsRegFcNodePortEntityIndex
    }
STATUS          current
DESCRIPTION
"isNS Server registered iFCP managed objects."
    ::= { isnsGroups 8 }

```

```

isnsNotificationsObjGroup  OBJECT-GROUP
OBJECTS {

```

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```

    isnsInstanceInfo,
    isnsAddressNotificationType,
    isnsAddressNotification,
    isnsTcpPortNotification,
    isnsUdpPortNotification
    }
STATUS          current
DESCRIPTION
"isNS Notification managed objects."
    ::= { isnsGroups 9 }

isnsServerNotificationGroup  NOTIFICATION-GROUP
NOTIFICATIONS {
    isnsServerStart,
    isnsServerShutdown
    }
STATUS          current
DESCRIPTION
"isNS Server Notification managed objects."
    ::= { isnsGroups 10 }

```

END

6. IANA Considerations

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

Descriptor -----	OBJECT IDENTIFIER value -----
isnsMIB	{ mib-2 YYYY }

Editor's Note (to be removed prior to publication): the IANA is requested to assign a value for "YYYY" under the 'mib-2' subtree and to record the assignment in the SMI Numbers registry. When the assignment has been made, the RFC Editor is asked to replace "YYYY" (here and in the MIB module) with the assigned value and to remove this note.

This RFC utilizes the IANA registry of iSNS parameters. This registry was created for the iSNS Specification [RFC4171], and is located at <http://www.iana.org/assignments/isns-parameters>. Specifically, the isnsRegEntityProtocol values used in the MIB module are the values for the Block Storage Protocols that IANA assigns and documents in <http://www.iana.org/assignments/isns-parameters>.

7. Security Considerations

There are no management objects defined in this MIB module that have a MAX-ACCESS clause of read-write and/or read-create. So, if this MIB module is implemented correctly, then there is no risk that an

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intruder can alter or create any management objects of this MIB module via direct SNMP SET operations.

Some of the readable objects in this MIB module (i.e., objects with a MAX-ACCESS other than not-accessible) may be considered sensitive or vulnerable in some network environments. It is thus important to control even GET and/or NOTIFY access to these objects and possibly to even encrypt the values of these objects when sending them over the network via SNMP. These are the tables and objects and their sensitivity/vulnerability:

The isnsDdsMemberTable contains information about which Discovery Domains may be enabled at the same time.

The isnsDdTable contains information about Discovery Domains, containing storage nodes with an ability to communicate and exchange

storage data.

The `isnsDdIscsiMemberTable` indicates which iSCSI nodes are contained in which Discovery Domains.

The `isnsDdPortalMemberTable` indicates which iSCSI portals are contained in which Discovery Domains.

The `isnsDdFcPortMemberTable` indicates which iFCP FC N_Ports are contained in which Discovery Domains.

The `isnsControlNodeIscsiTable` indicates which iSCSI nodes have the ability to possibly control an iSNS server.

The `isnsControlNodeFcPortTable` indicates which iFCP FC N_Ports have the ability to possibly control an iSNS server.

The above object tables provide information about storage objects sessions, and can indicate to a user who is communicating and exchanging storage data.

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

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

Further, deployment of SNMP versions prior to SNMPv3 is NOT RECOMMENDED. Instead, it is RECOMMENDED to deploy SNMPv3 and to enable cryptographic security. It is then a customer/operator responsibility to ensure that the SNMP entity giving access to an

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instance of this MIB module is properly configured to give access to the objects only to those principals (users) that have legitimate rights to indeed GET or SET (change/create/delete) them.

8. Normative References

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9. Informative References

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|----------------|----------------------------|------------|
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