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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.

## Table of Contents

Status of this Memo.....	<a href="#">1</a>
Abstract.....	<a href="#">1</a>
Table of Contents.....	<a href="#">2</a>
<a href="#">1.</a> The Internet-Standard Management Framework.....	<a href="#">3</a>
<a href="#">2.</a> Introduction.....	<a href="#">3</a>
<a href="#">3.</a> Technical Description.....	<a href="#">3</a>
<a href="#">3.1</a> iSNS Registered Objects.....	<a href="#">3</a>
<a href="#">3.2</a> iSNS MIB Structure.....	<a href="#">4</a>
<a href="#">3.3</a> iSNS Server Info.....	<a href="#">5</a>
<a href="#">3.3.1</a> Control Node Information.....	<a href="#">5</a>
<a href="#">3.3.2</a> Discovery Domain Set (DDS).....	<a href="#">5</a>
<a href="#">3.3.3</a> Discovery Domain (DD).....	<a href="#">5</a>
<a href="#">3.3.4</a> Registered Storage Objects.....	<a href="#">5</a>
<a href="#">3.3.4.1</a> Registered Entities.....	<a href="#">6</a>
<a href="#">3.3.4.2</a> Registered Portals.....	<a href="#">6</a>
<a href="#">3.3.4.3</a> Registered Portal Groups.....	<a href="#">6</a>
<a href="#">3.3.4.4</a> Registered iSCSI Nodes.....	<a href="#">6</a>
<a href="#">3.3.4.5</a> Registered FC Ports.....	<a href="#">6</a>
<a href="#">3.3.4.6</a> Registered FC Nodes.....	<a href="#">6</a>
<a href="#">3.4</a> Multiple Server Instances.....	<a href="#">6</a>
<a href="#">3.5</a> iSNS Notifications.....	<a href="#">6</a>
<a href="#">4.</a> MIB References and Requirement Levels.....	<a href="#">6</a>
<a href="#">5.</a> MIB Module.....	<a href="#">7</a>
<a href="#">6.</a> IANA Considerations.....	<a href="#">69</a>
<a href="#">7.</a> Security Considerations.....	<a href="#">69</a>
<a href="#">8.</a> Normative References.....	<a href="#">71</a>
<a href="#">9.</a> Informative References.....	<a href="#">71</a>
<a href="#">10.</a> Acknowledgements.....	<a href="#">72</a>
<a href="#">11.</a> Authors' Addresses.....	<a href="#">72</a>
<a href="#">12.</a> Full Copyright Statement.....	<a href="#">72</a>
<a href="#">13.</a> Intellectual Property Statement.....	<a href="#">73</a>
<a href="#">14.</a> Acknowledgment.....	<a href="#">73</a>
<a href="#">15.</a> Expiration Notice.....	<a href="#">73</a>

## 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].

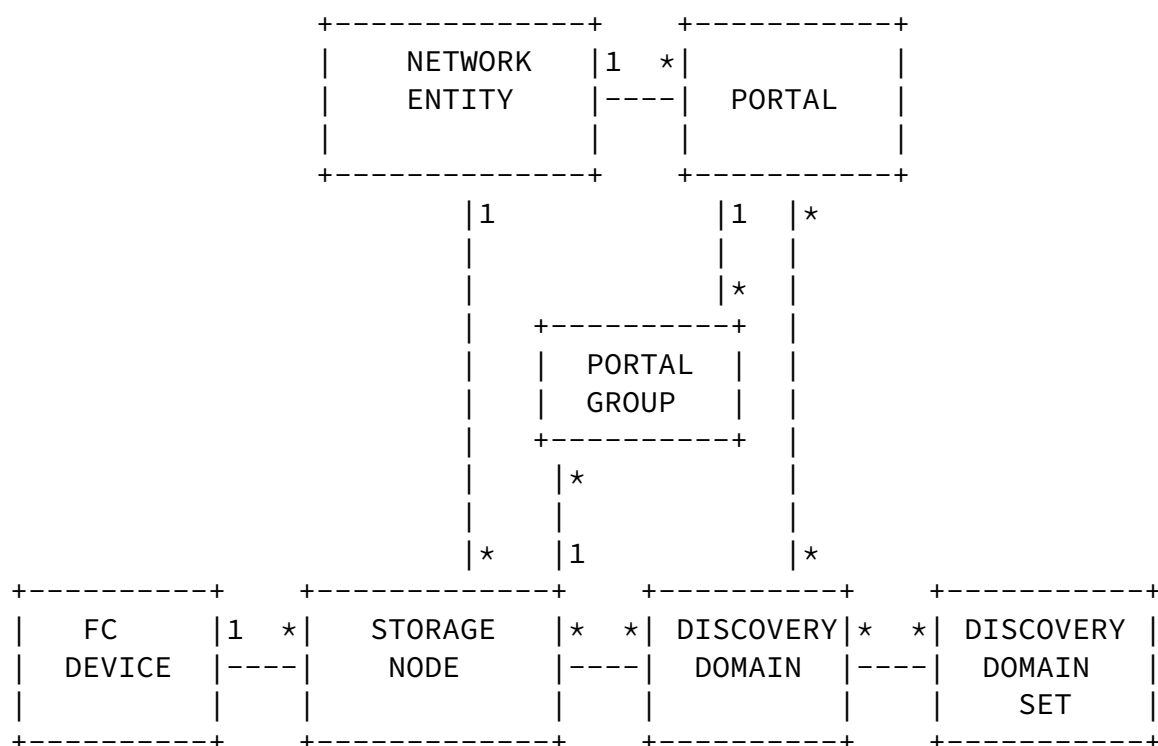
## 2. Introduction

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

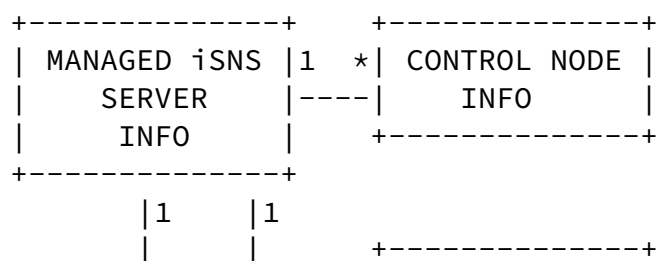
The following entity relationship figure indicates the objects that can be registered in the iSNS, and their relationship to each other.

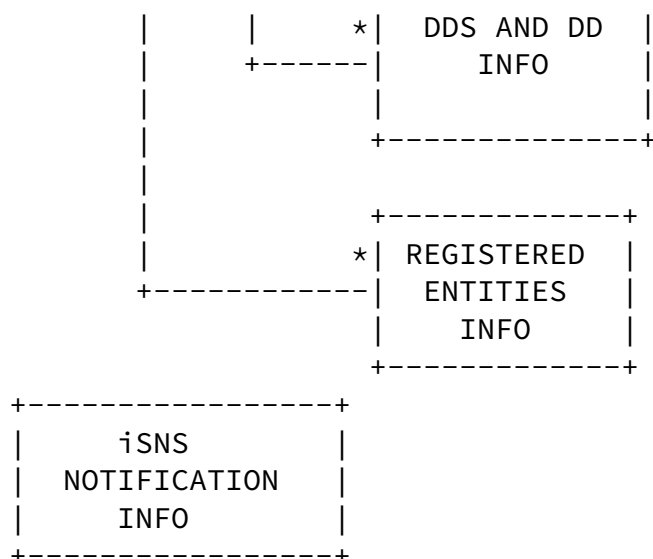


\* represents 0 to many possible relationships

### [3.2](#) iSNS MIB Structure

The MIB is divided into sections for iSNS server information, iSNS server registered objects information, and iSNS notifications.





Gibbons

Expires September 17, 2007

4

Internet Draft

iSNS MIB

March 2007

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 iSNSP 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.

Gibbons	Expires September 17, 2007	5
Internet Draft	iSNS MIB	March 2007

#### [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

Gibbons

Expires September 17, 2007

6

Internet Draft

iSNS MIB

March 2007

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,
    InetPortNumber
        FROM INET-ADDRESS-MIB

-- From RFC4044
    FcNameIdOrZero,
    FcAddressIdOrZero
        FROM FC-MGMT-MIB

-- From RFC4133
    PhysicalIndex

```

Gibbons Expires September 17, 2007

7

Internet Draft iSNS MIB

March 2007

```

    FROM ENTITY-MIB
;

```

```

isnsMIB MODULE-IDENTITY
    LAST-UPDATED "200703160000Z"
    ORGANIZATION "IETF IPS Working Group"
    CONTACT-INFO "
        Attn: Kevin Gibbons
                2Wire, Inc.
                1704 Automation Parkway
                San Jose, CA 95131
                USA
    "

```



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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

Gibbons Expires September 17, 2007

8

Internet Draft iSNS MIB

March 2007

-- 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

"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

Gibbons

Expires September 17, 2007

10

Internet Draft

iSNS MIB

March 2007

### 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"](#)

Gibbons

Expires September 17, 2007

11

Internet Draft

iSNS MIB

March 2007

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),

Gibbons Expires September 17, 2007 12

Internet Draft iSNS MIB March 2007

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),  
 aggressiveModeEnabled(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),

Gibbons

Expires September 17, 2007

13

Internet Draft

iSNS MIB

March 2007

```

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

Gibbons Expires September 17, 2007 14

Internet Draft iSNS MIB March 2007

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

Gibbons

Expires September 17, 2007

15

Internet Draft

iSNS MIB

March 2007

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),

Gibbons

Expires September 17, 2007

16

Internet Draft

iSNS MIB

March 2007

```

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

Gibbons                 Expires September 17, 2007                               17

Internet Draft                 iSNS MIB   March 2007

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 }
```

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		
Gibbons	Expires September 17, 2007	19
Internet Draft	iSNS MIB	March 2007

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

Gibbons            Expires September 17, 2007                20

Internet Draft      iSNS MIB                                March 2007

server             configured.
                  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

Gibbons	Expires September 17, 2007	21
---------	----------------------------	----

Internet Draft	iSNS MIB	March 2007
----------------	----------	------------

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

Gibbons Expires September 17, 2007

22

Internet Draft iSNS MIB

March 2007

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 }	

Gibbons	Expires September 17, 2007	23
---------	----------------------------	----

Internet Draft	iSNS MIB	March 2007
----------------	----------	------------

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

Gibbons                           Expires September 17, 2007

24

Internet Draft                    iSNS MIB

March 2007

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 {

Gibbons                      Expires September 17, 2007                      25

Internet Draft                iSNS MIB                      March 2007

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

```

isnsControlNodeIscsiNodeIndex OBJECT-TYPE
    SYNTAX                      IsnsNodeId
    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

```

-- 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

Gibbons

Expires September 17, 2007

27

Internet Draft

iSNS MIB

March 2007

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

```

```

Gibbons                      Expires September 17, 2007                      28

```

```

Internet Draft                iSNS MIB                      March 2007

```

```

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

Gibbons	Expires September 17, 2007	29
---------	----------------------------	----

Internet Draft	iSNS MIB	March 2007
----------------	----------	------------

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	

Gibbons                      Expires September 17, 2007

30

Internet Draft                      iSNS MIB

March 2007

"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."

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

::= { isnsDdEntry 2 }

isnsDdFeatures	OBJECT-TYPE
SYNTAX	IsnsDdFeatureType
MAX-ACCESS	read-only
STATUS	current

DESCRIPTION

"This defines the features the Discovery Domain has."

REFERENCE "[RFC4171, Section 6.11.2.9](#)"

::= { isnsDdEntry 3 }

Gibbons

Expires September 17, 2007

31

Internet Draft

iSNS MIB

March 2007

--  
-- Discovery Domain Members -----  
--

--  
-- DD iSCSI Node Membership Assignment  
--

isnsDdIscsiMemberTable	OBJECT-TYPE
SYNTAX	SEQUENCE OF IsnsDdIscsiMemberEntry
MAX-ACCESS	not-accessible
STATUS	current

DESCRIPTION

"A table containing iSCSI node indexes that have been assigned to specific DDs in this iSNS Server instance. The number of rows in the table is dependent on the number of relationships between iSCSI Nodes and DDs registered in the iSNS instance."

::= { isnsDdInfo 2 }

```

isnsDdIscsiMemberEntry      OBJECT-TYPE
    SYNTAX                   IsnsDdIscsiMemberEntry
    MAX-ACCESS                not-accessible
    STATUS                    current
    DESCRIPTION
        "The mapping of one iSCSI Node to a Discovery Domain to
        indicate membership in the DD. The indexes are the iSNS
        server instance, the DD ID of the Discovery Domain, and
        the iSCSI Node Index of the iSCSI Node."
    INDEX { isnsServerIndex,
            isnsDdId,
            isnsDdIscsiMemberIndex }
    ::= { isnsDdIscsiMemberTable 1 }

```

```

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 }

```

Gibbons

Expires September 17, 2007

32

Internet Draft

iSNS MIB

March 2007

```

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

Gibbons	Expires September 17, 2007	33
Internet Draft	iSNS MIB	March 2007

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 }

```

Gibbons Expires September 17, 2007

34

Internet Draft iSNS MIB

March 2007

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

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 }

Gibbons

Expires September 17, 2007

36

Internet Draft

iSNS MIB

March 2007

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,
```

Gibbons Expires September 17, 2007 37

Internet Draft iSNS MIB March 2007

```
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
All Others	As assigned by IANA

Gibbons Expires September 17, 2007 38

Internet Draft iSNS MIB March 2007

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

Gibbons                           Expires September 17, 2007

39

Internet Draft

iSNS MIB

March 2007

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

```

Gibbons Expires September 17, 2007 40

Internet Draft iSNS MIB March 2007

```

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

```

Gibbons Expires September 17, 2007 41

Internet Draft iSNS MIB March 2007

```

    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,

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 }

```



isnsRegPortalPort	OBJECT-TYPE
SYNTAX	InetPortNumber ( 1 .. 65535 )
MAX-ACCESS	read-only
STATUS	current
DESCRIPTION	
<p>"The port number for this Portal as defined in the iSNS Specification, <a href="#">RFC4171</a>. Whether the Portal type is TCP or UDP is indicated by isnsRegPortalPortType."</p>	
<p>REFERENCE "<a href="#">RFC4171, Section 6</a>"</p>	
<p>::= { isnsRegPortalEntry 5 }</p>	
isnsRegPortalSymbolicName	OBJECT-TYPE
SYNTAX	SnmpAdminString
MAX-ACCESS	read-only
STATUS	current
DESCRIPTION	
<p>"The Symbolic Name for this Portal as defined in the iSNS Specification, <a href="#">RFC4171</a>. If not provided then the string SHALL be zero-length."</p>	
<p>REFERENCE "<a href="#">RFC4171, Section 6</a>"</p>	
<p>::= { isnsRegPortalEntry 6 }</p>	
isnsRegPortalEsiInterval	OBJECT-TYPE
SYNTAX	Unsigned32 ( 0 .. 65535 )
UNITS	"seconds"
MAX-ACCESS	read-only
STATUS	current
DESCRIPTION	
<p>"The Entity Status Inquiry (ESI) Interval for this Portal as defined in the iSNS Specification, <a href="#">RFC4171</a>. A value of 0 indicates that ESI monitoring has not be configured for this Portal."</p>	
<p>REFERENCE "<a href="#">RFC4171, Section 6.3.4</a>"</p>	
<p>::= { isnsRegPortalEntry 7 }</p>	
isnsRegPortalEsiPortType	OBJECT-TYPE
SYNTAX	IsnsPortalPortTypeId
MAX-ACCESS	read-only
STATUS	current
DESCRIPTION	
<p>"The port type for the ESI Port, either UDP or TCP, as defined in the iSNS Specification, <a href="#">RFC4171</a>."</p>	
<p>REFERENCE "<a href="#">RFC4171, Section 6</a>"</p>	
<p>::= { isnsRegPortalEntry 8 }</p>	
isnsRegPortalEsiPort	OBJECT-TYPE
SYNTAX	InetPortNumber
MAX-ACCESS	read-only
STATUS	current
DESCRIPTION	

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
--

```

Gibbons	Expires September 17, 2007	45
Internet Draft	iSNS MIB	March 2007

```

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 }

Gibbons

Expires September 17, 2007

46

Internet Draft

iSNS MIB

March 2007

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 }

isnsRegPgPortalIndex	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

Gibbons Expires September 17, 2007 47  
 Internet Draft iSNS MIB March 2007

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	IsnsPortalGroupTagIdOrNull
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

Gibbons Expires September 17, 2007 48

Internet Draft iSNS MIB March 2007

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

```

Gibbons Expires September 17, 2007

49

Internet Draft

iSNS MIB

March 2007

```

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 " <a href="#">RFC4171, Section 6</a> "	
::= { 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 " <a href="#">RFC4171, Section 6.4.4</a> "	
::= { 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 <a href="#">RFC4171</a> . A zero-length string for this managed object indicates that a Node WWN token has not been assigned."	
REFERENCE " <a href="#">RFC4171, Section 6</a> "	
::= { isnsRegIscsiNodeEntry 6 }	

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

Gibbons	Expires September 17, 2007	50
Internet Draft	iSNS MIB	March 2007

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 <a href="#">RFC3720</a> - 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
}

```

Gibbons Expires September 17, 2007

51

Internet Draft iSNS MIB

March 2007

```

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, <a href="#">RFC4171</a> . A zero-length string is not valid for this managed object."	
REFERENCE " <a href="#">RFC4171, Section 6</a> "	
::= { 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, <a href="#">RFC4171</a> . This is a variable-length text-based description. If not provided then the string SHALL be zero-length."	
REFERENCE " <a href="#">RFC4171, Section 6</a> "	
::= { 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, <a href="#">RFC4171</a> . The format of this object is specified by isnsRegFcNodeAddressType."	
REFERENCE " <a href="#">RFC4171, Section 6</a> "	
::= { isnsRegFcNodeEntry 4 }	

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

## 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,

Gibbons

Expires September 17, 2007

53

Internet Draft

iSNS MIB

March 2007

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:

Gibbons Expires September 17, 2007

54

Internet Draft iSNS MIB

March 2007

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

Gibbons Expires September 17, 2007

55

Internet Draft iSNS MIB

March 2007

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, <a href="#">RFC4171</a> ."	
REFERENCE " <a href="#">RFC4171, Section 6.6.9</a> "	
::= { 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, <a href="#">RFC4171</a> . 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 " <a href="#">RFC4171, Section 6.6.10</a> "	
::= { isnsRegFcPortEntry 11 }	

Gibbons	Expires September 17, 2007	56
Internet Draft	iSNS MIB	March 2007

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, <a href="#">RFC4171</a> ."	
REFERENCE " <a href="#">RFC4171, Section 6.6.11</a> "	
::= { 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 " <a href="#">RFC4171, Section 6</a> "	
::= { 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 " <a href="#">RFC4171, Section 6</a> "	
::= { 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, <a href="#">RFC4171</a> . This managed object may contain a zero-length string prior to a device registering this value with the iSNS Server."	
REFERENCE " <a href="#">RFC4171, Section 6</a> "	
::= { 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	

Gibbons	Expires September 17, 2007	57
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Internet Draft	iSNS MIB	March 2007
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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 -----

Gibbons	Expires September 17, 2007	58
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Internet Draft	iSNS MIB	March 2007
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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

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

```

--

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."

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

```

Gibbons Expires September 17, 2007

62

Internet Draft iSNS MIB

March 2007

```

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

Gibbons

Expires September 17, 2007

63

Internet Draft

iSNS MIB

March 2007

"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

Gibbons Expires September 17, 2007

64

Internet Draft iSNS MIB

March 2007

```
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
    }

```

Gibbons Expires September 17, 2007

65

Internet Draft iSNS MIB

March 2007

}

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."

```

Gibbons	Expires September 17, 2007	66
Internet Draft	iSNS MIB	March 2007

```

::= { 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,
    }

```

Gibbons Expires September 17, 2007

67

Internet Draft iSNS MIB

March 2007

```

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 {

```

Gibbons Expires September 17, 2007

68

Internet Draft iSNS MIB

March 2007

```

    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

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

Gibbons

Expires September 17, 2007

70

Internet Draft

iSNS MIB

March 2007

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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Gibbons Expires September 17, 2007 71

Internet Draft iSNS MIB March 2007

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## [10.](#) Acknowledgements

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Gibbons	Expires September 17, 2007	72
Internet Draft	iSNS MIB	March 2007

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