

Document Type Definition (DTD) Notes for RAID, NAS, and SANSwitch Devices

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Overview

This document describes how to:

- Use the Device Data Files Plug-In (in general terms).
- Format an .XML file, so that its data can be directly imported into the Capacity Reporter database by the Device Data Files Plug-In. This document contains sample files to use for reference.

This is a companion document to the *Device Data Files Plug-In Notes*, located on the product CD at **Capacity\PlugIns\DeviceDataFilesPlugIn\readme.htm**, which contains specific instructions for using the plug-in.

This document *does not* describe how to create the “scanner” that gathers information from a RAID, NAS, or SANSwitch device and populates the .XML file. It assumes that you have the expertise to develop the scanner.

How to use the Device Data Files Plug-In

1. Develop a “scanner” to collect data from a RAID, NAS, or SANSwitch device.
2. Populate an .XML file, formatted according to the specifications in this document, with the data collected by the scanner. This file must eventually reside on the machine on which the Device Data Files Plug-In is installed.
3. Use the Device Data Files Plug-In Registration Wizard to register the device with the Capacity Reporter software.
4. During the next scheduled scan, the Capacity Reporter software retrieves the data from the .XML file through the Device Data Files Plug-In.

Important Notes about the Plug-In

- The plug-in works on Windows NT systems only.
- The plug-in does not perform error-checking or validation of data. Therefore, invalid data may be sent to the Capacity Reporter software and cause errors.
- The Registration Wizard does not validate the file and path information that you enter. If you enter invalid information during registration, the Capacity Reporter software displays “device missing” errors for that device after scanning.
- The plug-in cannot make your scanner run. If you want to gather data on a regular basis, you must include this functionality in your scanner.

How to Get Help

If you have questions about formatting the .XML file or about the Device Data Files Plug-In, contact Sun Professional Services.

XML Data Specifications for RAID

The RAID Base View provides a look into the internals of RAID objects. These agents collect data from the RAID object, and report on physical and logical attributes.



1.1 Data to Collect

You can collect the following data from RAID objects:

- Space allocated
- Free space
- Current file information
- Current user information

Data	Description	Units
Name	Logical name (required), and world-wide identifier (optional).	N/A
Redundant Controllers	Boolean flag to indicate if multiple controllers are configured to be redundant.	N/A
Total Capacity	Sum of the total raw capacity of the RAID system. This includes all disks, regardless of whether or not they are formatted.	Binary MB (1024x1024 bytes)
Total Unused Space	Total free space capacity of the physical disks in the RAID system	Binary MB (1024x1024 bytes)
Supported RAID Types	Comma-separated list of supported RAID types for this RAID system, such as JBOD, RAID1, and so on.	N/A
LUN Masking	Boolean flag to indicate whether or not this RAID system supports LUN masking.	N/A

Data	Description	Units
Performance (optional)	Expected performance of this RAID system, most likely based on marketing specifications.	MB/second
Enclosure (optional)	Standalone box in which the RAID system resides. This includes model, manufacturer, serial number (optional), firmware revision (optional), and the management server link (optional) that consists of a management server URL and display name.	N/A
Vendor Scan Information String (optional)	Vendor-defined string containing information needed by the vendor's plug-in.	N/A
List of Controllers (one or more)	<p>For each controller (controller is the RAID hardware):</p> <ul style="list-style-type: none"> • Name – Vendor-specified name for the controller This name must be used for all future references to the controller • IP address –IP address of the RAID object • Model –RAID object model name/number • Manufacturer –Name of the RAID object's manufacturer • Serial number –RAID object serial number • Firmware level –Revision level of the firmware currently operating the RAID object • Link to management server –URL (optional) and display name (optional) of the onboard (embedded) management Web server • List of ports and types (zero or more) – Each port description contains the port name (world-wide identifier), type (SCSI or FIBRECHANNEL), and the world-wide identifier of where the port is connected (end point ID) 	N/A
List of LUNs (zero or more)	<p>For each LUN (LUN is the logical unit that the RAID system maps to a physical object):</p> <ul style="list-style-type: none"> • Name –Logical name (required), world-wide identifier (optional), and IP address (optional) • QOS attributes (Quality of Service) –QOS attributes of the LUN: <ul style="list-style-type: none"> • RAID level – Numeric value • Remote copy – Boolean • Being backed up – Boolean • Total Space – Size of the LUN drive • LUN number of storage units – number of storage units that have been combined into a LUN • LUN to host mapping (zero or more) – List of the names of all the hosts that map to this LUN 	Binary MB (1024x1024 bytes), where applicable

Data	Description	Units
Storage Pools	RAID Array parity groups. For each storage pool: <ul style="list-style-type: none"> • Name – Logical name (required) • Total RAIDed space – Total size of the storage pool • RAID type – Supported RAID types for this RAID system, such as RAID1 or RAID5 • Total physical space deployed – Size of the physical disks • Number of storage units –Physical number of LDEVs (0 through n) • Unallocated space – Space within the storage pool not yet allocated to an active storage unit (LDEV) 	Binary MB (1024x1024 bytes), where applicable
Storage Units	RAID array LDEVs. For each storage unit: <ul style="list-style-type: none"> • Name – Logical name (required) • Total RAIDed space – Total size of the storage unit • RAID type – Supported RAID types for this RAID system, such as RAID1 or RAID5 • Disk emulation – String name that indicates the type of disk being emulated, if any For UNIX/Windows NT/Windows 2000 machines, this field corresponds to the size of the storage unit, as defined by the name (example: Open-3, Open-4) For Mainframe machines, this field indicates the type of disk being emulated, such as 3390-3. • Storage pool – Storage pool to which this storage unit belongs. 	Binary MB (1024x1024 bytes), where applicable
Plug-In version (optional)	Four-part version number for the plug-in, determined by the vendor. Format: X.x.x.x (example: 4.1.1.2)	N/A

1.2 RAID DTD Format

This section shows the DTD format you must follow when creating the RAID .XML file that is read by the Device Data Files Plug-In.

Note – The actual .DTD file resides on the Capacity Reporter Server machine at `/StorageResourceManager/raid.dtd`. If any discrepancies exist between the format in this document and the raid.dtd file, use the format described in the raid.dtd file.

Appendix A contains an actual RAID .XML file that you can use for reference.

CODE EXAMPLE 1-1 Sample RAID DTD Format

```
<?xml version="1.0"?>

<!-- Copyright (c) 2001-2002 Sun Microsystems Inc. All rights
reserved. -->

<!-- ***** -->
<!-- Root element, the RAID BaseView -->
<!-- ***** -->
<!ELEMENT RAIDBaseView (RAIDSystem)>
<!-- Version of this XML report format -->
<!ATTLIST RAIDBaseView
        version CDATA "1.0">

<!-- ***** -->
<!-- RAIDSystem element : The entire RAID system, which -->
<!-- consists of: -->
<!-- ID: Name and world-wide identifier of the RAID system -->
<!-- totalSpace: The total capacity of the RAID system -->
<!-- supportedRAIDType: Comma-separated list of supported -->
<!-- RAID types for this RAID system, such as -->
<!-- RAID0, JBOD, RAID1, etc. -->
<!-- supportsLUNMasking: Whether or not LUN masking is -->
<!-- supported. -->
<!-- performance: Expected performance of the RAID -->
<!-- system. (optional) -->
<!-- enclosure: The housing of the RAID system -->
<!-- controller: The RAID device(s) -->
<!-- LUN: Logical name of the drive which maps to the -->
<!-- RAID device -->
<!-- scanInfo: Vendor-defined scanner info (optional) -->
<!-- plugInVersion: Version number of the PlugIn component -->
<!-- storagePool: RAID Storage Pool (eg. HDS Lightning -->
```

```

<!--                               Parity Groups)    -->
<!--                               (optional)        -->
<!--                               storageUnit: RAID Storage Unit (eg. HDS Lightning
-->
<!--                               LDEVs)            -->
<!--                               (optional)        -->
<!-- ***** -->
<!ELEMENT RAIDSystem (ID, totalSpace, supportedRAIDType,
performance?,
                               enclosure?, totalUnusedSpace?, controller+,
LUN*, scanInfo?,
                               plugInVersion?, storageUnit*,
storagePool*)>

<!-- Attributes: category: The RAIDSystem element requires a    -->
<!--                               category with a value of "RAID"    -->
<!--                               HGType: HighGround-specific type of "RAID"    -->
<!--                               isRedundantController: Boolean flag to indicate -->
<!--                               if there are multiple controllers    -->
<!--                               configured to be redundant.    -->
<!--                               supportsLUNMasking: Boolean as to whether or    -->
<!--                               not LUN masking is supported on the    -->
<!--                               RAID system.    -->
<!ATTLIST RAIDSystem
        category CDATA #FIXED "RAID"
        HGType    CDATA #FIXED "RAID"
        isRedundantController (TRUE|FALSE|true|false) #REQUIRED
        supportsLUNMasking (TRUE|FALSE|true|false) #REQUIRED>

<!-- ***** -->
<!-- ID element    -->
<!-- ***** -->
<!-- Name, optional world wide identifier, and optional IP    -->
<!-- address for the RAIDbox and LUNs.    -->
<!ELEMENT ID (name, worldwideId?, IPAddress?)>
<!ELEMENT name                (#PCDATA)>

```

```

<!ELEMENT worldwideId          (#PCDATA)>

<!-- ***** -->
<!-- totalSpace element: -->
<!--     The total raw space capacity of the physical -->
<!--     disks in the RAID system, in binary MB -->
<!--     (1024 x 1024 bytes). -->
<!-- ***** -->
<!ELEMENT totalSpace          (#PCDATA)>

<!-- ***** -->
<!-- totalUnusedSpace element: -->
<!--     The total free space capacity of the physical -->
<!--     disks in the RAID system, in binary MB -->
<!--     (1024 x 1024 bytes). -->
<!-- ***** -->
<!ELEMENT totalUnusedSpace    (#PCDATA)>

<!-- ***** -->
<!-- Enclosure element: The standalone box which houses the -->
<!--     RAID system, which consists of: -->
<!--     model : the enclosure model name -->
<!--     manufacturer : manufacturer of the enclosure case -->
<!--     serialNumber (optional): serial num of the enclosure -->
<!--     firmwareLevel (optional): revision of the firmware -->
<!--     mgmtServerLink (optional): URL and display name of -->
<!--     the enclosure's management web server -->
<!-- ***** -->
<!ELEMENT enclosure (model, manufacturer, serialNumber?,
                    firmwareLevel?, mgmtServerLink?)>

<!-- ***** -->
<!-- SupportedRAIDType element: Comma-separated list of -->
<!--     supported RAID types for this RAID system, such as -->
<!--     RAID0, RAID1, JBOD, etc. -->

```

```

<!-- ***** -->
<!ELEMENT supportedRAIDType      (#PCDATA)>

<!-- ***** -->
<!-- performance element: Expected performance of the RAID -->
<!--      system, in MB/sec. Based on the marketing -->
<!--      specifications. (optional) -->
<!-- ***** -->
<!ELEMENT performance            (#PCDATA)>

<!-- ***** -->
<!-- Controller element: The RAID hardware which performs -->
<!--      mapping of the data from the logical unit (LUN) to the -->
<!--      physical storage device. Consists of: -->
<!--      name : a name for the controller element -->
<!--      IPAddress : IP address of the RAID device(optional)-->
<!--      model : the model name of the controller -->
<!--      manufacturer : manufacturer of the RAID device -->
<!--      serialNumber : serial number of the RAID device -->
<!--      firmwareLevel : revision of the RAID firmware -->
<!--      mgmtServerLink: URL and display name of the -->
<!--      controller's management web server -->
<!--      (optional) -->
<!--      port : List of one or more ports and associated -->
<!--      information of the controller (optional) -->
<!-- ***** -->
<!ELEMENT controller (name, IPAddress?, model, manufacturer,
                      serialNumber, firmwareLevel,
                      mgmtServerLink?, port*)>

<!-- The controller element requires a category -->
<!-- attribute with the value of "RAIDController". -->
<!ATTLIST controller category CDATA #FIXED "RAIDController">

<!-- The IP address of the RAID device -->
<!ELEMENT IPAddress          (#PCDATA)>

```

```

<!-- ***** -->
<!-- Port element: The controller device port's name (world -->
<!-- wide identifier), type, and end point -->
<!-- connection id (optional). -->
<!-- ***** -->
<!ELEMENT port (name, endPointId?)>

<!-- Attributes: portType: port type is either SCSI or FIBRECHANNEL -->
-->
<!-- category: The port element requires a category -->
<!-- attribute with the value of "RAIDPort". -->
<!ATTLIST port portType (SCSI|FIBRECHANNEL) #REQUIRED
category CDATA #FIXED "RAIDPort">

<!-- endPointId is the world-wide id to which -->
<!-- the port is physically connected. -->
<!ELEMENT endPointId (#PCDATA)>

<!-- ***** -->
<!-- Members of the enclosure and controller elements -->
<!-- ***** -->
<!-- The name of the RAID device manufacturer -->
<!ELEMENT manufacturer (#PCDATA)>

<!-- The model name/number of the RAID device -->
<!ELEMENT model (#PCDATA)>

<!-- The serial number of the RAID device -->
<!ELEMENT serialNumber (#PCDATA)>

<!-- The revision level of the firmware operating the RAID device -->
<!ELEMENT firmwareLevel (#PCDATA)>

<!-- The onboard (imbedded) management web server -->
<!ELEMENT mgmtServerLink (mgmtServerURL?, mgmtDisplayName?)>

```

```

<!-- The URL of the management server -->
<!ELEMENT mgmtServerURL          (#PCDATA)>
<!-- The display name of the management server -->
<!ELEMENT mgmtDisplayName        (#PCDATA)>

<!-- ScanInfo is a BaseView vendor-defined string, used to -->
<!-- pass information needed by the BV scan between the -->
<!-- SRM server and the BV scanner. -->
<!ELEMENT scanInfo              (#PCDATA)>

<!ELEMENT LUNNumOfStorageUnits   (#PCDATA)>

<!-- ***** -->
<!-- LUN element (Logical Unit): -->
<!-- Logical name of the drive (which the RAID system -->
<!-- maps to a physical device), its attributes, the -->
<!-- total space on the LUN, and all the hosts which -->
<!-- map to the LUN (optional). -->
<!-- ***** -->
<!ELEMENT LUN (ID, QOSAttrs, LUNTotalSpace, LUNHostMapping*,
LUNNumOfStorageUnits?)>
<!-- The LUN element requires a category -->
<!-- attribute with the value of "RAIDLUN". -->

<!ATTLIST LUN
          category CDATA #FIXED "RAIDLUN">

<!-- QOS (Quality Of Service) attributes of the LUN. -->
<!ELEMENT QOSAttrs              EMPTY>
<!ATTLIST QOSAttrs raidLevel CDATA #REQUIRED
                    remoteCopy (TRUE|FALSE|UNKNOWN|true|false|unknown)
#REQUIRED
                    beingBackedUp (TRUE|FALSE|UNKNOWN|true|false|unknown)
#REQUIRED>

<!-- The total space of the LUN, in binary MB (1024 x 1024 bytes). -->
<!ELEMENT LUNTotalSpace         (#PCDATA)>

```

```

<!-- A list of all hosts which map to this LUN. (optional) -->
<!ELEMENT LUNHostMapping          (name)>
<!-- The LUNHostMapping element requires a category    -->
<!-- attribute with the value of "RAIDLUNHostMapping". -->
<!ATTLIST LUNHostMapping category CDATA #FIXED "RAIDLUNHostMapping">

<!-- ***** -->
<!-- plugInVersion element:                                -->
<!-- PlugIn Version element: 4 part version number of the -->
<!-- RAID BaseView scanner with the format of:  #.#.#.#   -->
<!-- (optional)                                           -->
<!-- ***** -->
<!ELEMENT plugInVersion          (#PCDATA)>

<!-- ***** -->
<!-- Construct storagePool element hierarchy...          -->
<!-- These are the Parity Groups on the HDS Lightning    -->
<!-- (optional).                                         -->
<!-- ***** -->

<!ELEMENT storagePool (name, storagePoolTotalRAIDedSpace?,
                        storagePoolRAIDType?,
                        storagePoolTotalPhysicalSpaceDeployed?,
                        storagePoolNumberOfStorageUnits?,
                        storagePoolUnallocatedSpace?)>

<!ELEMENT storagePoolTotalRAIDedSpace          (#PCDATA)>
<!ELEMENT storagePoolRAIDType                  (#PCDATA)>
<!ELEMENT storagePoolTotalPhysicalSpaceDeployed (#PCDATA)>
<!ELEMENT storagePoolNumberOfStorageUnits       (#PCDATA)>
<!ELEMENT storagePoolUnallocatedSpace          (#PCDATA)>

<!ATTLIST storagePool category CDATA #FIXED "RAIDStoragePool">

```



```

<!-- ***** -->
<!-- Construct storageUnit element hierarchy... -->
<!-- These are the LDEVs on the HDS Lightning -->
<!-- (optional). -->
<!-- ***** -->

<!ELEMENT storageUnit (name, storageUnitTotalRAIDedSpace?,
                        storageUnitRAIDType?,
                        storageUnitDiskEmulation?,
                        storageUnitsStoragePool*)>

<!ELEMENT storageUnitTotalRAIDedSpace      (#PCDATA)>
<!ELEMENT storageUnitRAIDType              (#PCDATA)>
<!ELEMENT storageUnitDiskEmulation         (#PCDATA)>
<!ELEMENT storageUnitsStoragePool          (#PCDATA)>

<!ATTLIST storageUnit category CDATA #FIXED "RAIDStorageUnit">

```


XML Data Specifications for NAS

Network-attached storage (NAS) objects provide centralized data storage that multiple machines can share. Network shares expose the NAS object's data, and various protocols access these network shares.

A NAS object appears in the Capacity Reporter user interface as a managed computer with limited information and functionality. The exported shares are displayed as file systems to expose the desired reporting in the current infrastructure.

To perform the NAS share scans, install Capacity Reporter Agent software on designated proxy computer(s). The computers do not need to be licensed agents. By default, a proxy computer installs as if it is a managed computer. However, the user can mark a proxy computer as **Not using a license**, which tells the Capacity Reporter software to use this computer to scan a NAS box. The proxy computer is not scanned as a computer.

2.1 Data to Collect

You can collect the following data from NAS objects:

- User and group space consumption
- Information for each share:
 - Space used
 - Largest directories
 - File distribution
 - Largest files
 - Size threshold
 - Trends

Data	Description	Units
Description	IP address resolves this. The name/description is the host NAS object's display name and description.	N/A
Description (optional)	Comment describing the object.	N/A
Link to management server (optional)	Two fields, consisting of: <ul style="list-style-type: none"> • URL address of the NAS Management Server • Display name of the NAS Management Server 	N/A
IP Address	IP address of the object.	N/A
Manufacturer	Manufacturer of the object.	N/A
Model	Object's model name or number.	N/A
Serial number	Object's serial number.	N/A
OS platform	Internal operating system and revision number (if desired) of the NAS system. Note: The first characters of this field <i>must</i> specify the type of system being scanned, such as NAS or NetWare. For example, if the system being scanned is a NAS box on a UNIX operating system, enter NAS UNIX in this field.	N/A
Firmware level	Level of the embedded operating system on the object.	N/A
Free space	Amount of free space on the object.	Binary MB (1024x1024 bytes)
Total space	Sum of the total capacity of the object. This includes all disks, regardless of whether or not they are formatted.	Binary MB (1024x1024 bytes)
Total active ports	Total number of active ports being used by the NAS server.	N/A
Number of processors (optional)	Number of processors in the NAS system.	N/A
Cache size (optional)	Size of the page file on the NAS system.	MB
RAM (optional)	Amount of RAM on the NAS system.	MB
HGType	Type of object being scanned. This is a required field, used by the plug-in framework. Valid entry: NAS	N/A

Data	Description	Units
Vendor Scan Information String (optional)	Vendor-defined string containing information needed by the vendor's plug-in.	N/A
List of shares (zero or more)	For each share: <ul style="list-style-type: none"> • Share name (with no prepended computer name) • Share type (CIFS or NFS) • Total space (optional) • Free space (optional) • Description (optional) • Redundancy type <ul style="list-style-type: none"> • Simple – NT Primary, NT Logical • Spanning – NT VolumeSet • RaidStriping – RAID Level 0 (example: NT StripeSet) • RaidMirroring – RAID Level 1 (example: NT MirrorSet) • RaidHamming – RAID Level 2 • RaidParallelAccessWithParity – RAID Level 3 • RaidIndependentAccessWithParity – RAID Level 4 • RaidStripingWithParity – RAID Level 5 • RaidStripingWithParityPlusCheckData – RAID Level 6 • RaidStripingAndMirroring – RAID Levels 0+1 • AdaptingRaid • OtherRaid • Redundancy description (display name of redundancy type) 	MB, where applicable
List of disks (zero or more)	For each disk: <ul style="list-style-type: none"> • Type of disk (optional) • Name of disk (optional) • Total space (optional) • Manufacturer (optional) • Model of disk (optional) • Serial number (optional) • Firmware level (optional) 	MB, where applicable

Data	Description	Units
List of disk volumes (zero or more)	For each volume: <ul style="list-style-type: none"> • Name of volume • Name of disk • Size of volume section • Start of volume section – the size of all space preceding this section 	KB, where applicable
List of exports (zero or more)	For each export: <ul style="list-style-type: none"> • Share name • Pathname • Description (optional) • Owner name (optional) • Domain of owner (optional) • Flags (optional) (unused) • Permissions (optional) Permission values include: <ul style="list-style-type: none"> • 0 – Unknown • 1 – World read and write • 2 – World read only 	
Plug-In version	Four-part version number for the plug-in, determined by the vendor. Format: X.x.x.x (example: 4.1.1.2)	

2.2 NAS DTD Format

This section shows the DTD format you must follow when creating the NAS .XML file that is read by the Device Data Files Plug-In.

Note – The actual .DTD file resides on the Capacity Reporter Server machine at **/StorageResourceManager/nas.dtd**. If any discrepancies exist between the format in this document and the nas.dtd file, use the format described in the nas.dtd file.

Appendix B contains an actual NAS .XML file that you can use for reference.

CODE EXAMPLE 2-1 Sample NAS DTD Format

```
<?xml version="1.0"?>
<!-- Copyright (c) 1995-2001, HighGround Systems Inc. All rights
reserved. -->
<!-- ***** -->
<!-- Root element, the NAS Base View. -->
<!-- ***** -->
```

```

<!ELEMENT NASBaseView (NASBox)>
<!-- Version of this XML report format. -->
<!ATTLIST NASBaseView version CDATA "1.0">

<!-- ***** -->
<!-- NASBox element -->
<!-- ***** -->
<!ELEMENT NASBox (name, displayName, IPAddress, manufacturer,
model, serialNumber, OSPlatform, firmwareLevel,
mgmtServerLink?, description?, totalSpace,
freeSpace, totalActivePorts, numProcessors?,
cacheSize?, RAM?, disk*, shares*, voldisk*,
export*, scanInfo?, plugInVersion?)>
<!-- The NASBox element requires a category -->
<!-- attribute with the value of "NAS". -->
<!ATTLIST NASBox category CDATA #FIXED "NAS"
HGType CDATA "NAS">

<!-- ***** -->
<!-- Members of the NASBox element. -->
<!-- ***** -->
<!-- The DNS name of the host NAS device -->
<!ELEMENT name (#PCDATA)>

<!-- The NAS system display name (computer name). -->
<!-- Max of 32 chars. -->
<!ELEMENT displayName (#PCDATA)>
<!-- The IP address of the NAS device -->
<!ELEMENT IPAddress (#PCDATA)>

<!-- Description of the device or the share. -->
<!ELEMENT description (#PCDATA)>

<!-- The manufacturer of the device. -->
<!ELEMENT manufacturer (#PCDATA)>

<!-- The device model name or number. -->
<!ELEMENT model (#PCDATA)>

<!-- The device serial number. -->
<!ELEMENT serialNumber (#PCDATA)>

<!-- The internal operating system and revision number -->
<!-- of NAS system. -->
<!ELEMENT OSPlatform (#PCDATA)>

```

```

<!-- The level of the thin O/S, the proprietary operating -->
<!--      system on this device.      -->
<!ELEMENT firmwareLevel      (#PCDATA)>

<!-- The NAS management server -->
<!ELEMENT mgmtServerLink (mgmtServerURL?, mgmtDisplayName?)>
<!-- The URL of the management server -->
<!ELEMENT mgmtServerURL      (#PCDATA)>
<!-- The display name of the management server -->
<!ELEMENT mgmtDisplayName      (#PCDATA)>
<!-- The sum of the total capacity of the device.  This -->
<!--      includes all disks, whether formatted or not.  -->
<!ELEMENT totalSpace      (#PCDATA)>

<!-- The total free space on the device. -->
<!ELEMENT freeSpace      (#PCDATA)>

<!-- The number of active ports in use by the NAS server. -->
<!ELEMENT totalActivePorts      (#PCDATA)>

<!-- The number processors in the NAS box. -->
<!ELEMENT numProcessors      (#PCDATA)>

<!-- The size of the cache on the NAS box (in MB). -->
<!ELEMENT cacheSize      (#PCDATA)>

<!-- The amount of RAM in the NAS box (in MB). -->
<!ELEMENT RAM      (#PCDATA)>

<!-- ScanInfo is a Base View vendor-defined string, used to -->
<!-- pass information needed by the BV scan between the -->
<!-- SRM server and the BV scanner. -->
<!ELEMENT scanInfo      (#PCDATA)>

<!-- Plug-In Version element: 4 part version number of the -->
<!-- NAS Base View scanner with the format of:  #.#.#.# -->
<!-- (optional) -->
<!ELEMENT plugInVersion      (#PCDATA)>

<!-- ***** -->
<!-- shares element (these are seen as filesystems in SRM) -->
<!--      Contains: Share Name, -->
<!--      Share Type, -->
<!--      Description of the share (optional), -->
<!--      Redundancy Type, -->

```



```

<!--          Redundancy Description (display name of Type) -->
<!-- ***** -->
<!ELEMENT shares (share, description?, redundancy)>
<!-- The shares element requires a category -->
<!-- attribute with the value of "NASShare". -->
<!ATTLIST shares category CDATA #FIXED "NASShare">

<!-- A share is made up of its name, type, total space (in MB, -->
<!-- optional), free space (in MB, optional), and a boolean -->
<!-- indicating if compression is on (optional). -->
<!-- The share name must NOT have a prepended computer name. -->
<!-- The share type can be either CIFS, NFS, NetWare, -->
<!-- NetWareNSS, NetWareNSS_ADMIN, CIFS_Snapshot, -->
<!-- NFS_Snapshot, or other. -->
<!ELEMENT share (name, totalSpace?, freeSpace?)>

<!ATTLIST share
    shareType
    (CIFS|NFS|NetWare|NetWareNSS|NetWareNSS_ADMIN|CIFS_Snapshot|NFS_Sna
    pshot|other) #REQUIRED
    compressionOn (TRUE|FALSE|true|false) #IMPLIED>
<!-- Redundancy is made up of a type and a description. -->
<!-- Type must be one of the values described in the -->
<!-- RedundancyType attribute. -->
<!-- Description (redundDesc) is the display name of the -->
<!-- Type. -->
<!ELEMENT redundancy (redundDesc)>
<!ATTLIST redundancy
    redundancyType (Simple|Spanning|RaidStriping|RaidMirroring|
    RaidHamming|
    RaidParallelAccessWithParity|
    RaidIndependentAccessWithParity|
    RaidStripingWithParity|
    RaidStripingWithParityPlusCheckData|
    RaidStripingAndMirroring|
    AdaptingRaid|
    OtherRaid) #REQUIRED>
<!ELEMENT redundDesc (#PCDATA)>

<!-- ***** -->
<!-- disk element -->
<!-- ***** -->
<!ELEMENT disk (diskType?, name, totalSpace?, manufacturer?,
    model?, serialNumber?, firmwareLevel?)>
<!-- The disk element requires a category -->

```

```

<!-- attribute with the value of "NASDisk". -->
<!ATTLIST disk category CDATA #FIXED "NASDisk">

<!ELEMENT diskType                (#PCDATA)>
<!-- ***** -->
<!-- voldisk element -->
<!-- ***** -->
<!ELEMENT voldisk (volname,diskname, startKb?, SizeKb?)>
<!-- The voldisk element requires a category -->
<!-- attribute with the value of "NASVoldDisk". -->
<!ATTLIST voldisk
        category CDATA #FIXED "NASVoldDisk">

<!ELEMENT volname                (#PCDATA)>
<!ELEMENT diskname                (#PCDATA)>
<!ELEMENT sizeKb                (#PCDATA)>
<!ELEMENT startKb                (#PCDATA)>

<!-- ***** -->
<!-- export element (these are seen as shares in SRM) -->
<!-- ***** -->
<!ELEMENT export (name, pathname, description?, ownerName?,
ownerDomain?, flags?, permissions?)>
<!-- The export element requires a category -->
<!-- attribute with the value of "NASExport". -->
<!ATTLIST export
        category CDATA #FIXED "NASExport">

<!ELEMENT pathname                (#PCDATA)>
<!ELEMENT ownerName                (#PCDATA)>
<!ELEMENT ownerDomain                (#PCDATA)>
<!ELEMENT flags                (#PCDATA)>
<!ELEMENT permissions                (#PCDATA)>

```

XML Data Specifications for SANSwitch

A Fibre channel switch provides an intelligent, high-speed interconnection for a SANSwitch. These agents collect data from the switch and report basic physical and logical information.

3.1 Data to Collect

You can collect edge point topology from SANSwitch objects.

Data	Description	Units
Name	Logical name of the switch.	N/A
IP address (optional)	IP address of the switch.	N/A
Manufacturer	Name of the switch manufacturer.	N/A
Model	Switch model name or number.	N/A
Serial number	Switch serial number.	N/A
Firmware level	Revision level of the firmware currently operating the switch.	N/A
List of performance by port (optional)	Current throughput per port by scan time. This value is calculated from the average KB/second and the high-water mark. For each port's performance: <ul style="list-style-type: none">• Port name• Performance value• Date/time stamp	KB/sec, where applicable

Data	Description	Units
Link to management server (optional)	Two fields consisting of: <ul style="list-style-type: none"> • URL address • Display name of the NAS Management Server 	N/A
List of host connectors (optional)	All object hosts associated with each port on the switch. For each connection: <ul style="list-style-type: none"> • Port name • Host name of storage object 	N/A
List of storage connectors (optional)	All objects associated with each port on the switch. For example, removable objects and RAID arrays. For each connection: <ul style="list-style-type: none"> • Port name • Host name of storage object 	N/A
Vendor Scan Information String (optional)	Vendor-defined string containing information needed by the vendor's plug-in.	N/A
Plug-In version (optional)	Four-part version number for the plug-in, determined by the vendor. Format: X.x.x.x (example: 4.1.1.2)	N/A

3.2 SANSwitch DTD Format

This section shows the DTD format you must follow when creating the SANSwitch .XML file that is read by the Device Data Files Plug-In.

Note – The actual .DTD file resides on the Capacity Reporter Server machine at **/StorageResourceManager/san.dtd**. If any discrepancies exist between the format in this document and the san.dtd file, use the format described in the san.dtd file.

Appendix C contains an actual SANSwitch .XML file that you can use for reference.

CODE EXAMPLE 3-1 Sample SANSwitch DTD Format

```
<?xml version="1.0"?>
<!-- Copyright (c) 1995-2001, HighGround Systems Inc. All rights
reserved. -->
<!-- ***** -->
<!-- Root element, the SAN BaseView. -->
<!-- ***** -->
<!-- ELEMENT SANBaseView (SANSwitch)>
```

```

<!-- Version of this XML report format.                                -->
<!ATTLIST SANBaseView
    version CDATA "1.0">
<!-- ***** -->
<!-- Root element, the SAN Switch                                     -->
<!--     Contains:                                                    -->
<!--         Network DNS name                                         -->
<!--         IP Address (optional)                                    -->
<!--         Manufacturer                                             -->
<!--         Model                                                    -->
<!--         Serial Number                                            -->
<!--         Firmware revision level                                  -->
<!--         Link (URL) to Management server (optional)             -->
<!--         Performance (optional)                                   -->
<!--         Hosts for each port on the switch (optional)            -->
<!--         Storage device for each port on the switch (optional)   -->
<!--             (optional)                                           -->
<!--         Scan Information string (optional)                       -->
<!--         Version number of the Plug-in component                 -->
<!-- ***** -->
<!ELEMENT SANSwitch (name, IPAddress?, manufacturer,
    model, serialNumber, firmwareLevel,
    mgmtServerLink?, performance*,
    hostConnections*, storageConnections*,
    scanInfo?, plugInVersion?)>
<!-- The SAN switch element requires a category -->
<!-- attribute with the value of "SANSwitch" and an -->
<!-- HGType attribute with the value of "SANSwitch".-->
<!-- If either of these aren't specified, they will -->
<!-- default to these values. -->
<!ATTLIST SANSwitch category CDATA #FIXED "SANSwitch"
    HGType CDATA #FIXED "SANSwitch">

<!-- ***** -->
<!-- Members of the SANSwitch element                                -->
<!-- ***** -->
<!-- The logical name of the switch. -->
<!ELEMENT name (#PCDATA)>

<!-- The IP address of the switch. -->
<!ELEMENT IPAddress (#PCDATA)>

<!-- The manufacturer of the switch. -->
<!ELEMENT manufacturer (#PCDATA)>

```

```

<!-- The switch model name or number. -->
<!ELEMENT model                (#PCDATA)>

<!-- The switch serial number. -->
<!ELEMENT serialNumber        (#PCDATA)>

<!-- The revision level of the firmware currently -->
<!-- operating the switch. -->
<!ELEMENT firmwareLevel      (#PCDATA)>

<!-- The SAN management server -->
<!ELEMENT mgmtServerLink (mgmtServerURL?, mgmtDisplayName?)>
<!-- The URL of the management server -->
<!ELEMENT mgmtServerURL      (#PCDATA)>
<!-- The display name of the management server -->
<!ELEMENT mgmtDisplayName    (#PCDATA)>
<!-- ScanInfo is a Base View vendor-defined string, used to -->
<!-- pass information needed by the BV scan between the -->
<!-- SRM server and the BV scanner. -->
<!ELEMENT scanInfo          (#PCDATA)>

<!-- Plug-In Version element: 4 part version number of the -->
<!-- SAN Base View scanner with the format of:  #.#.#.# -->
<!-- (optional) -->
<!ELEMENT plugInVersion      (#PCDATA)>

<!-- ***** -->
<!-- Performance element -->
<!-- The performance is per port and is based on -->
<!-- the current throughput per port by scan -->
<!-- time. It is calculated from the average -->
<!-- KB/second and the high water mark, which is -->
<!-- composed of the port, value, and date/time -->
<!-- stamp. -->
<!-- ***** -->
<!ELEMENT performance (name, value, dateTimeStamp)>
<!-- The performance element requires a category -->
<!-- attribute with the value of "SANSwitchPerformance". -->
<!ATTLIST performance
        category CDATA #FIXED "SANSwitchPerformance">

<!-- name used to store the port name for performance, -->
<!-- hostConnections, and storageDeviceName elements. -->
<!ELEMENT value                (#PCDATA)>
<!ELEMENT dateTimeStamp       (#PCDATA)>

```

```

<!-- ***** -->
<!-- HostConnections element -->
<!--      All storage device hosts associated with -->
<!--      each port ('name' element) on the switch. -->
<!-- ***** -->
<!ELEMENT hostConnections (name, hostName)>
<!-- The hostConnections element requires a category -->
<!-- attribute with the value of "SANSwitchHostConnection".-->
<!ATTLIST hostConnections
        category CDATA #FIXED "SANSwitchHostConnection">

<!-- The host name of the storage device. -->
<!ELEMENT hostName          (#PCDATA)>
<!-- See performance element for name definition -->
<!-- ***** -->
<!-- storageConnections element -->
<!--      All storage devices associated with each -->
<!--      port ('name' element) on the switch. -->
<!-- ***** -->
<!ELEMENT storageConnections (name, storageDeviceName)>
<!-- The storageConnections element requires a category -->
<!-- attribute with the value of "SANSwitchStorageConnection". -->
<!ATTLIST storageConnections
        category CDATA #FIXED "SANSwitchStorageConnection">

<!-- The name of the storage device. -->
<!ELEMENT storageDeviceName  (#PCDATA)>
<!-- See performance element for name definition -->

```


Sample RAID .XML File

```

<?xml version="1.0"?>
<!DOCTYPE RAIDBaseView SYSTEM "RAID.dtd">
<RAIDBaseView version="1.0">
    <RAIDSystem category="RAID" HGType="RAID"
isRedundantController="TRUE" supportsLUNMasking="TRUE">
        <ID>
            <name>9900Series-60162-tester2</name>
            <worldwideId>ARRAY.HDS9910.60162</worldwideId>
            <IPAddress>10.8.61.78</IPAddress>
        </ID>
        <totalSpace>1661300.66</totalSpace>
        <supportedRAIDType>RAID0+1,RAID5</supportedRAIDType>
        <performance>200</performance>
        <enclosure>
            <model>9910</model>
            <manufacturer>Hitachi Data Systems, Inc.</manufacturer>
            <serialNumber>60162</serialNumber>
            <firmwareLevel>01-13-42/00</firmwareLevel>
            <mgmtServerLink>

<mgmtServerURL>http://10.8.62.55:2001</mgmtServerURL>
                <mgmtDisplayName>HiCommand Server
Management Console</mgmtDisplayName>
            </mgmtServerLink>
        </enclosure>
        <totalUnusedSpace>1121521.00</totalUnusedSpace>
        <controller category="RAIDController">
            <name>CHA-1C</name>
            <IPAddress>10.8.61.78</IPAddress>
            <model>FIBRECHANNEL</model>
            <manufacturer>Hitachi Data Systems, Inc.</manufacturer>
            <serialNumber>60162</serialNumber>
            <firmwareLevel>01-13-19-00/00</firmwareLevel>

```

```

<mgmtServerLink>
  <mgmtServerURL></mgmtServerURL>
  <mgmtDisplayName></mgmtDisplayName>
</mgmtServerLink>
<port portType="FIBRECHANNEL" category="RAIDPort">
  <name>CL1-A</name>
  <endPointId></endPointId>
</port>
<port portType="FIBRECHANNEL" category="RAIDPort">
  <name>CL1-B</name>
  <endPointId></endPointId>
</port>
<port portType="FIBRECHANNEL" category="RAIDPort">
  <name>CL1-C</name>
  <endPointId></endPointId>
</port>
<port portType="FIBRECHANNEL" category="RAIDPort">
  <name>CL1-D</name>
  <endPointId></endPointId>
</port>
</controller>
<controller category="RAIDController">
  <name>CHA-1D</name>
  <IPAddress>10.8.61.78</IPAddress>
  <model>FIBRECHANNEL</model>
  <manufacturer>Hitachi Data Systems, Inc.</manufacturer>
  <serialNumber>60162</serialNumber>
  <firmwareLevel>01-13-19-00/00</firmwareLevel>
  <mgmtServerLink>
    <mgmtServerURL></mgmtServerURL>
    <mgmtDisplayName></mgmtDisplayName>
  </mgmtServerLink>
  <port portType="FIBRECHANNEL" category="RAIDPort">
    <name>CL1-E</name>
    <endPointId></endPointId>
  </port>
  <port portType="FIBRECHANNEL" category="RAIDPort">
    <name>CL1-F</name>
    <endPointId></endPointId>
  </port>
  <port portType="FIBRECHANNEL" category="RAIDPort">
    <name>CL1-G</name>
    <endPointId></endPointId>
  </port>
  <port portType="FIBRECHANNEL" category="RAIDPort">

```

```

        <name>CL1-H</name>
        <endPointId></endPointId>
    </port>
</controller>
<controller category="RAIDController">
    <name>CHA-1F</name>
    <IPAddress>10.8.61.78</IPAddress>
    <model>ESCON</model>
    <manufacturer>Hitachi Data Systems, Inc.</manufacturer>
    <serialNumber>60162</serialNumber>
    <firmwareLevel>01-13-19-00/00</firmwareLevel>
    <mgmtServerLink>
        <mgmtServerURL></mgmtServerURL>
        <mgmtDisplayName></mgmtDisplayName>
    </mgmtServerLink>
    <port portType="ESCON" category="RAIDPort">
        <name>CL1-J</name>
        <endPointId></endPointId>
    </port>
    <port portType="ESCON" category="RAIDPort">
        <name>CL1-K</name>
        <endPointId></endPointId>
    </port>
</controller>
<controller category="RAIDController">
    <name>CHA-2G</name>
    <IPAddress>10.8.61.78</IPAddress>
    <model>FIBRECHANNEL</model>
    <manufacturer>Hitachi Data Systems, Inc.</manufacturer>
    <serialNumber>60162</serialNumber>
    <firmwareLevel>01-13-19-00/00</firmwareLevel>
    <mgmtServerLink>
        <mgmtServerURL></mgmtServerURL>
        <mgmtDisplayName></mgmtDisplayName>
    </mgmtServerLink>
    <port portType="FIBRECHANNEL" category="RAIDPort">
        <name>CL2-A</name>
        <endPointId></endPointId>
    </port>
    <port portType="FIBRECHANNEL" category="RAIDPort">
        <name>CL2-B</name>
        <endPointId></endPointId>
    </port>
    <port portType="FIBRECHANNEL" category="RAIDPort">
        <name>CL2-C</name>

```

```

        <endPointId></endPointId>
    </port>
    <port portType="FIBRECHANNEL" category="RAIDPort">
        <name>CL2-D</name>
        <endPointId></endPointId>
    </port>
</controller>
<controller category="RAIDController">
    <name>CHA-2J</name>
    <IPAddress>10.8.61.78</IPAddress>
    <model>FIBRECHANNEL</model>
    <manufacturer>Hitachi Data Systems, Inc.</manufacturer>
    <serialNumber>60162</serialNumber>
    <firmwareLevel>01-13-19-00/00</firmwareLevel>
    <mgmtServerLink>
        <mgmtServerURL></mgmtServerURL>
        <mgmtDisplayName></mgmtDisplayName>
    </mgmtServerLink>
    <port portType="FIBRECHANNEL" category="RAIDPort">
        <name>CL2-E</name>
        <endPointId></endPointId>
    </port>
    <port portType="FIBRECHANNEL" category="RAIDPort">
        <name>CL2-F</name>
        <endPointId></endPointId>
    </port>
    <port portType="FIBRECHANNEL" category="RAIDPort">
        <name>CL2-G</name>
        <endPointId></endPointId>
    </port>
    <port portType="FIBRECHANNEL" category="RAIDPort">
        <name>CL2-H</name>
        <endPointId></endPointId>
    </port>
</controller>
<controller category="RAIDController">
    <name>CHA-2K</name>
    <IPAddress>10.8.61.78</IPAddress>
    <model>ESCON</model>
    <manufacturer>Hitachi Data Systems, Inc.</manufacturer>
    <serialNumber>60162</serialNumber>
    <firmwareLevel>01-13-19-00/00</firmwareLevel>
    <mgmtServerLink>
        <mgmtServerURL></mgmtServerURL>
        <mgmtDisplayName></mgmtDisplayName>

```

```

        </mgmtServerLink>
        <port portType="ESCON" category="RAIDPort">
            <name>CL2-J</name>
            <endPointId></endPointId>
        </port>
        <port portType="ESCON" category="RAIDPort">
            <name>CL2-K</name>
            <endPointId></endPointId>
        </port>
    </controller>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:00</name>
            <worldwideld>LU.HDS9910.60162.0</worldwideld>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>4694.06</LUNTotalSpace>
        <LUNHostMapping category="RAIDLUNHostMapping">
            <name>10.00.00.00.C9.21.F2.86</name>
        </LUNHostMapping>
        <LUNHostMapping category="RAIDLUNHostMapping">
            <name>20.00.00.00.C9.21.F2.86</name>
        </LUNHostMapping>
        <LUNHostMapping category="RAIDLUNHostMapping">
            <name>50.06.0B.00.00.04.21.99</name>
        </LUNHostMapping>
        <LUNNumOfStorageUnits>2</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:01</name>
            <worldwideld>LU.HDS9910.60162.1</worldwideld>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>4694.06</LUNTotalSpace>
        <LUNHostMapping category="RAIDLUNHostMapping">
            <name>50.06.0B.00.00.04.21.99</name>
        </LUNHostMapping>
        <LUNNumOfStorageUnits>2</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:0B</name>

```

```

        <worldwideId>LU.HDS9910.60162.11</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:0C</name>
        <worldwideId>LU.HDS9910.60162.12</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:0F</name>
        <worldwideId>LU.HDS9910.60162.15</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:10</name>
        <worldwideId>LU.HDS9910.60162.16</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:11</name>
        <worldwideId>LU.HDS9910.60162.17</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>

```

```

        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:12</name>
            <worldwidId>LU.HDS9910.60162.18</worldwidId>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>2347.03</LUNTotalSpace>
        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:13</name>
            <worldwidId>LU.HDS9910.60162.19</worldwidId>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>2347.03</LUNTotalSpace>
        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:02</name>
            <worldwidId>LU.HDS9910.60162.2</worldwidId>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>2347.03</LUNTotalSpace>
        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:14</name>
            <worldwidId>LU.HDS9910.60162.20</worldwidId>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>2347.03</LUNTotalSpace>
        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:15</name>

```

```

        <worldwideId>LU.HDS9910.60162.21</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:16</name>
        <worldwideId>LU.HDS9910.60162.22</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:17</name>
        <worldwideId>LU.HDS9910.60162.23</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:18</name>
        <worldwideId>LU.HDS9910.60162.24</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:19</name>
        <worldwideId>LU.HDS9910.60162.25</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>

```



```

        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:03</name>
            <worldwideId>LU.HDS9910.60162.3</worldwideId>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>9388.12</LUNTotalSpace>
        <LUNNumOfStorageUnits>4</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:20</name>
            <worldwideId>LU.HDS9910.60162.32</worldwideId>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>2347.03</LUNTotalSpace>
        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:30</name>
            <worldwideId>LU.HDS9910.60162.48</worldwideId>
        </ID>
        <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>2347.03</LUNTotalSpace>
        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:40</name>
            <worldwideId>LU.HDS9910.60162.64</worldwideId>
        </ID>
        <QOSAttrs raidLevel="RAID5" remoteCopy="unknown"
beingBackedUp="unknown"/>
        <LUNTotalSpace>2347.03</LUNTotalSpace>
        <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
    </LUN>
    <LUN category="RAIDLUN">
        <ID>
            <name>0:07</name>

```

```

        <worldwideId>LU.HDS9910.60162.7</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:4A</name>
        <worldwideId>LU.HDS9910.60162.74</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID5" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>7041.09</LUNTotalSpace>
    <LUNNumOfStorageUnits>3</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:08</name>
        <worldwideId>LU.HDS9910.60162.8</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>9388.12</LUNTotalSpace>
    <LUNNumOfStorageUnits>4</LUNNumOfStorageUnits>
</LUN>
<LUN category="RAIDLUN">
    <ID>
        <name>0:09</name>
        <worldwideId>LU.HDS9910.60162.9</worldwideId>
    </ID>
    <QOSAttrs raidLevel="RAID0+1" remoteCopy="unknown"
beingBackedUp="unknown"/>
    <LUNTotalSpace>2347.03</LUNTotalSpace>
    <LUNNumOfStorageUnits>1</LUNNumOfStorageUnits>
</LUN>
<plugInVersion>5.0.2.0000000104</plugInVersion>
<storageUnit category="RAIDStorageUnit">
    <name>0:00</name>

<storageUnitTotalRAIDedSpace>2347</storageUnitTotalRAIDedSpace>

<storageUnitRAIDType>RAID0+1</storageUnitRAIDType>

```

```

        <storageUnitDiskEmulation>OPEN-
3</storageUnitDiskEmulation>
        <storageUnitsStoragePool>1-
1</storageUnitsStoragePool>
        </storageUnit>
        <storageUnit category="RAIDStorageUnit">
            <name>0:01</name>

<storageUnitTotalRAIDedSpace>2347</storageUnitTotalRAIDedSpace>

<storageUnitRAIDType>RAID0+1</storageUnitRAIDType>
        <storageUnitDiskEmulation>OPEN-
3</storageUnitDiskEmulation>
        <storageUnitsStoragePool>1-
1</storageUnitsStoragePool>
        </storageUnit>
        <storageUnit category="RAIDStorageUnit">
            <name>0:63</name>

<storageUnitTotalRAIDedSpace>2347</storageUnitTotalRAIDedSpace>
        <storageUnitRAIDType>RAID5</storageUnitRAIDType>
        <storageUnitDiskEmulation>OPEN-
3</storageUnitDiskEmulation>
        <storageUnitsStoragePool>1-
2</storageUnitsStoragePool>
        </storageUnit>
        <storagePool category="RAIDStoragePool">
            <name>1-1</name>

<storagePoolTotalRAIDedSpace>139058</storagePoolTotalRAIDedSpace>

<storagePoolRAIDType>RAID0+1</storagePoolRAIDType>

<storagePoolTotalPhysicalSpaceDeployed>274658</storagePoolTotalPhysicalSpaceDeployed>

<storagePoolNumberOfStorageUnits>59</storagePoolNumberOfStorageUnits>

<storagePoolUnallocatedSpace>584</storagePoolUnallocatedSpace>
        </storagePool>
        <storagePool category="RAIDStoragePool">
            <name>1-10</name>

<storagePoolTotalRAIDedSpace>0</storagePoolTotalRAIDedSpace>
        <storagePoolRAIDType>RAID5</storagePoolRAIDType>

```

```
<storagePoolTotalPhysicalSpaceDeployed>274658</storagePoolTotalPhysicalSpaceDeployed>

<storagePoolNumberOfStorageUnits>73</storagePoolNumberOfStorageUnits>

<storagePoolUnallocatedSpace>0</storagePoolUnallocatedSpace>
  </storagePool>
    </RAIDSystem>
  </RAIDBaseView>
```

Sample NAS .XML File

```

<?xml version ="1.0"?>
<!DOCTYPE NASBaseView SYSTEM "NAS.dtd">
<!--Generated by XML Authority.-->
<NASBaseView version = "1.0"><!-- (NASBox )-->
    <NASBox category = "NAS" HGType = "NAS">
        <!-- (name , displayName , IPAddress , manufacturer , model , serialNumber , OSPlatform
        , firmwareLevel , mgmtServerLink? , description? , totalSpace , freeSpace , totalActivePorts,
        numProcessors, cacheSize, RAM, shares+, scanInfo )-->
            <name>FILER1</name>
            <displayName>Tomato</displayName>
            <IPAddress>111.111.111.111</IPAddress>
            <manufacturer>NAS Manufacturer</manufacturer>
            <model>NAS model 101</model>
            <serialNumber>111111111111</serialNumber>
            <OSPlatform>UNIX</OSPlatform>
            <firmwareLevel>5</firmwareLevel>
            <mgmtServerLink><!-- (mgmtServerURL? , mgmtDisplayName?
) -->

<mgmtServerURL>www.tomato.server</mgmtServerURL>
            <mgmtDisplayName>Tomato Management
Console</mgmtDisplayName>
            </mgmtServerLink>
            <description>NAS description</description>
            <totalSpace>100000</totalSpace>
            <freeSpace>40000</freeSpace>
            <totalActivePorts>14</totalActivePorts>
            <numProcessors>2</numProcessors>
            <cacheSize>8192</cacheSize>
            <RAM>500</RAM>
            <shares category = "NASShare"><!-- (share , description? ,
redundancy )-->

                <share shareType = "CIFS"><!-- (name )-->

```

```

        <name>\ArchiveBuilds</name>
        <totalSpace>9000000</totalSpace>
        <freeSpace>3000000</freeSpace>
    </share>
    <description>Share Description 1</description>
    <redundancy redundancyType = "RaidHamming"><!--
(redundDesc )-->
        <redundDesc>Redund description</redundDesc>
    </redundancy>
</shares>
<shares category = "NASShare">
    <share shareType = "CIFS"><!-- (name )-->
        <name>\DailyBuilds</name>
    </share>
    <description>Share Description 2</description>
    <redundancy redundancyType = "AdaptingRaid"><!--
(redundDesc )-->
        <redundDesc>Redund2 description</redundDesc>
    </redundancy>
</shares>
<scanInfo>VendorDefinedInfoString contains
ANYTHING!</scanInfo>
    <plugInVersion>5.0.1.178</plugInVersion>
</NASBox>
</NASBaseView>

```

Sample SANSwitch .XML File

```
<?xml version ="1.0"?>
<!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
<!DOCTYPE SANBaseView SYSTEM "SAN.dtd">
<SANBaseView version = "1.0">
    <SANSwitch category = "SANSwitch">
        <name>ENG2800-1</name>
        <IPAddress>10.1.255.23</IPAddress>
        <manufacturer>Brocade</manufacturer>
        <model>1600 Family</model>
        <serialNumber>1000-0F60-69B0-5CC8</serialNumber>
        <firmwareLevel>v1.6d</firmwareLevel>
        <mgmtServerLink>
            <mgmtServerURL>http://10.1.255.23</mgmtServerURL>
            <mgmtDisplayName></mgmtDisplayName>
        </mgmtServerLink>
    <!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
        <hostConnections category = "SANSwitchHostConnection">
            <name>0</name>
            <hostName>2000-0000-C921-85F0</hostName>
        </hostConnections>
    <!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
        <hostConnections category = "SANSwitchHostConnection">
            <name>1</name>
            <hostName>2000-0000-C921-85F1</hostName>
        </hostConnections>
    <!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
        <hostConnections category = "SANSwitchHostConnection">
            <name>2</name>
            <hostName>2000-0000-C921-85F2</hostName>
        </hostConnections>
    <!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
        <hostConnections category = "SANSwitchHostConnection">
```

```

        <name>3</name>
        <hostName>2000-0000-C921-85F3</hostName>
    </hostConnections>
<!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
    <hostConnections category = "SANSwitchHostConnection">
        <name>4</name>
        <hostName>2000-0000-C921-85F4</hostName>
    </hostConnections>
<!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
    <hostConnections category = "SANSwitchHostConnection">
        <name>5</name>
        <hostName>2000-0000-C921-85F5</hostName>
    </hostConnections>
<!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
    <hostConnections category = "SANSwitchHostConnection">
        <name>6</name>
        <hostName>2000-0000-C921-85F6</hostName>
    </hostConnections>
<!-- Copyright (c) 1995-2000, HighGround Systems Inc. All rights reserved. -->
    <hostConnections category = "SANSwitchHostConnection">
        <name>7</name>
        <hostName>2000-0000-C921-85F7</hostName>
    </hostConnections>
    <!-- <scanInfo>HOSTNAME=10.1.255.23,MIB_NAMES=
RFC1213-MIB;SW-MIB;FCFABRIC-ELEMENT-MIB,INI_FILE=SAN.ini,TMPL_FILE=
SAN.xml,REG_KEY=SOFTWARE\HighGround\SRMPlugIn-
BrocadeSwitch/InstallDir,DLLNAME=MIB.dll,PREFIX=Brocade-,APP_NAME=SRMPlugIn-
BrocadeSwitch,COMMUNITY=public</scanInfo> -->
    <plugInVersion>4.0.1.042</plugInVersion>
</SANSwitch>
</SANBaseView>

```