

Data Structure Description

NWSM_NAME_LIST	B-2
Scanning Structures	B-2
NWSM_SCAN_CONTROL	B-3
Zero Date and Time Fields	B-6
Scanning Settings	B-6
NWSM_SELECTION_LIST	B-11
NWSM_SCAN_INFORMATION	B-18
NWSM_DATA_SET_NAME_LIST	B-19
NWSM_VERSION_INFORMATION	B-23

The following shows a list data types used in SMS.

BUFFERPTR	UINT8 *
CCODE	signed long, 4 bytes
LSTRING	length (1 byte) preceded char array
NWBOOLEAN	short, 2 bytes
STRING	null terminated unsigned char array
UINT8	unsigned char, 1 byte
UINT16	unsigned integer, 2 bytes
UINT32	unsigned integer, 4 bytes

Also, the following structures are used.

```
STRING_BUFFER
typedef struct
{
    UINT16 size;
    UINT8 string[1];
}STRING_BUFFER;
```

size is size of the STRING_BUFFER structure.

string contains a null terminated string.

```
UINT16_BUFFER
typedef struct
{
    UINT16 size;
    UINT16 buffer[1];
}UINT16_BUFFER;
```

size is the size of the UINT16_BUFFER structure.

buffer contains user specific data.

NWSM_NAME_LIST

This structure contains the following:

```
typedef struct _NWSM_NAME_LIST
{
    STRING name;
    _NWSM_NAME_LIST *next;
} NWSM_NAME_LIST;
```

name contains a null terminated string.

Scanning Structures

The TSA uses two data structures to determine which data sets are scanned: NWSM_SCAN_CONTROL and NWSM_SELECTION_LIST. Two more structures are used to return information about the data sets found:

NWSM_SCAN_INFORMATION,
NWSM_DATA_SET_NAME_LIST. A description of the
control and information structures follows.

NWSM_SCAN_CONTROL

The following scan control structure qualifies which data sets
are scanned:

```
typedef struct
{
    UINT16    bufferSize;
    UINT16    scanControlSize;
    UINT32    scanType;
    UINT32    firstAccessDateAndTime;
    UINT32    lastAccessDateAndTime;
    UINT32    firstCreateDateAndTime;
    UINT32    lastCreateDateAndTime;
    UINT32    firstModifiedDateAndTime;
    UINT32    lastModifiedDateAndTime;
    UINT32    firstArchivedDateAndTime;
    UINT32    lastArchivedDateAndTime;
    UINT8     returnChildTerminalNodeNameOnly;
    UINT8     parentsOnly;
    UINT8     childrenOnly;
    UINT8     createSkippedDataSetsFile;
    UINT8     generateCRC;
    UINT8     reserved[6];
    UINT32    scanChildNameSpaceType;
    UINT32    returnNameSpaceType;
    UINT8     callScanFilter;
    UINT16    otherInformationSize;
    UINT8     otherInformation[otherInformationSize];
} NWSM_SCAN_CONTROL;
```

bufferSize specifies the total buffer size allocated, which
maybe larger than the structure and *otherInformation*.

Note: A large buffer avoids reallocating overhead.

scanControlSize defines the actual memory space used by the
structure from *scanControlSize* through the end of
otherInformation inclusively.

scanType is a bit map that is used to indicate to the TSA a
user's selected scan type option(s). These options are listed
below; **NWSMTSGetTargetScanTypeString** indicates the
options supported by a TSA (see "Scan Type Options" in
Chapter 1 for more information):

<u>Scan Type</u>	<u>Value</u>
NWSM_DO_NOT_TRAVERSE	0x0001
NWSM_EXCLUDE_ARCHIVED_CHILDREN	0x0002
NWSM_EXCLUDE_HIDDEN_CHILDREN	0x0004
NWSM_EXCLUDE_HIDDEN_PARENTS	0x0008

NWSM_EXCLUDE_SYSTEM_CHILDREN	0x0010
NWSM_EXCLUDE_SYSTEM_PARENTS	0x0020
NWSM_EXCLUDE_CHILD_TRUSTEES	0x0040
NWSM_EXCLUDE_PARENT_TRUSTEES	0x0080
NWSM_EXCLUDE_ACCESS_DATABASE	0x0100
NWSM_EXCLUDE_VOLUME_RESTS	0x0200
NWSM_EXCLUDE_DISK_SPACE_RESTS	0x0400
NWSM_EXCLUDE_EXTENDED_ATTRIBUTES	0x0800
NWSM_EXCLUDE_DATA_STREAMS	0x1000
NWSM_EXCLUDE_MIGRATED_CHILD	0x2000
NWSM_EXPAND_COMPRESSED_DATA	0x4000

The definition of all flags should be governed by the following guideline: define the flags so they can be ORed with another to produce the desired action.

The following fields set the date and time boundaries of data sets to scan for (See "Zero Date and Time Fields" in this chapter for more information):

firstAccessDateAndTime
lastAccessDateAndTime
firstCreateDateAndTime
lastCreateDateAndTime
firstModifiedDateAndTime
lastModifiedDateAndTime
firstArchivedDateAndTime
lastArchivedDateAndTime

Note: The fields above contain DOS packed date and time values. The "DOS Date and Time Functions" shown in *Storage Management Services Utilities Library* can be used to pack or unpack these values.

returnChildTerminalNodeNameOnly, if set to TRUE, tells the TSA to return the terminal name only (i.e., the last node in a path) if the data set is a child. For example, the following are returned under DOS:

<u><i>returnChildTerminalNodeNameOnly</i></u>	<u>Type</u>	<u>Information Returned</u>
FALSE	DIR	Full path
	FILE	Full path
TRUE	DIR	Full path
	FILE	File name only

parentsOnly, if set to TRUE, tells the TSA to scan only for parents.

childrenOnly, if set to TRUE, tells the TSA to scan only for children. This cannot be used if the parent has subdirectories.

createSkippedDataSetsFile, if set, creates a file containing the data sets that were skipped during a session. See **NWSMTSScanDataSetBegin**'s remarks about "SKIPPED DATA SETS."

generateCRC, if set to TRUE, tells the TSA to generate CRCs on the data sets. This enhances data integrity, but decreases the TSA's performance slightly.

scanChildNameSpaceType determines the name space scanned. If it is not set to NWSM_ALL_NAME_SPACES, the TSA looks only for children under the specified name space.

returnNameSpaceType, if set to TRUE, tells the TSA to scan for data sets of a particular name space(s). The following are defined:

NWSM_ALL_NAME_SPACES
NWSM_TSA_DEFINED_RESOURCE_TYPE
NWSM_CREATOR_NAME_SPACE
NWSM_DIRECTORY_NAME_SPACE
DOSNameSpace
MACNameSpace
NFSNameSpace
FTAMNameSpace
OS2NameSpace

Note: NWSM_CREATOR_NAME_SPACE returns the name space that created the data set.

callScanFilter, if set to TRUE, tells the TSA to use an engine-developer-defined filter.

Note: *callScanFilter* is not supported under the current release of NetWare 4.0. However, it will be supported in future releases.

otherInformationSize specifies the size of the *otherInformation* field.

otherInformation contains developer specified information.

Zero Date and Time Fields

The date and time fields of NWSM_SCAN_CONTROL are scanning filters, that set the scope of a scan. A zero value in any field that starts with "first," tells the TSA to include all files up to the point indicated by the "last" field. In other words, there are no constraints for the starting point of the scan. A zero in the "last" field, includes all files starting from the point indicated in the "first" field. Or in other words there are no constraints for the ending point of the scan. This idea is further explained below:

<u>firstAccessDateAndTime</u>	<u>lastAccessDateAndTime</u>	<u>Results</u>
October 12, 1985 12:00:00	April 1, 1989 12:00:00	Return information on all files that were accessed between the times of October 12, 1985 12:00:00 and April 1, 1989 12:00:00.
0	April 1, 1989 12:00:00	Return information on all files that were accessed up until April 1, 1989 12:00:00.
October 12, 1985 12:00:00	0	Return information on all files that were accessed since October 12, 1985 12:00:00.
0	0	Return information about all files.

Scanning Settings

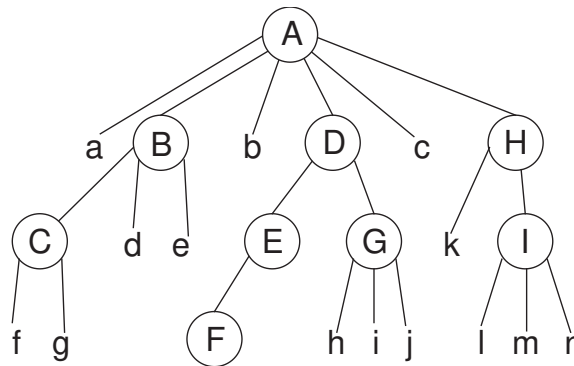
This section describes how some of the scan control fields interact to produce a desired results. Before the interactions are described a few terms and abbreviations need to be explained.

The following terminologies are defined to clarify the description (each term is relative to *resourceName* of **NWSMTSScanDataSetBegin**):

- *Immediate parent(s)* refer to all directories just below *resourceName*. This does not include the subdirectories of the immediate parent. For example, if Figure B-1 is the target being scanned and *resourceName* is set to parent A,

the immediate parents are B, D, and H. This term is used only in this section for description purposes. It is not an SMS term.

- *Distant parent(s)* refer to all parents that are below the immediate parent. For example, if Figure B-1 is the target being scanned and *resourceName* is set to parent A, the distant parents are C, E, F, G, I, and J. This term is used only in this section for description purposes. It is not an SMS term.
- *Parent(s)* refer to immediate and distant parents. All parents can have siblings that are parents and children.
- *Child or children* refer to files only. Under SMS any object that can have siblings (e.g., a directory or a subdirectory) is not a child.



Scanning Order: AabcBdeCfgDEFGhijHklImn

Figure B-1. Scanning Order

The list below explains the abbreviations for the following table. There are two parts to the list, the abbreviation and the explanation. The explanation contains both the expansion of the abbreviation and the scan control field it represents (in parenthesis).

- CNO Child Name Only
(*returnChildTerminalNodeNameOnly*) If the table entry is TRUE, only the name of the child is returned (no path information). Otherwise a fully qualified path is returned with the data set (parent or child).
- CO Children Only (*childrenOnly*).
- PO Parents Only (*parentsOnly*).

- DNT Do not traverse the target's file system (bit zero of *scanType*).
- IC Is Child. IC is not a field of NWSMTS_SCAN_CONTROL. It represents a parameter (*resourceName*) of **NWSMTSScanDataSetBegin**. If the table entry is 1, *resourceName* contains the name of a child. If the entry 0, *resourceName* contains a path with parents only (a child name is not specified). No wild cards are allowed for *resourceName*.

CNO	CO	PO	DNT	IC	Data Sets or Completion Code Returned by the Scanning Functions ¹
0	0	0	0	0	All immediate parents, distant parents, and children are returned (each data set contains a fully qualified path).
0	0	0	0	1	Only 1 child with a fully qualified path is returned.
0	0	0	1	0	All immediate parent(s) under <i>resourceName</i> are returned.
0	0	0	1	1	1 child with a fully qualified path is returned.
0	0	1	0	0	All immediate and distant parents under <i>resourceName</i> are returned.
0	0	1	0	1	Invalid setting. The setting requests a scan for only parents, but <i>resourceName</i> contains the name of a child. NWSM_DATA_SET_NOT_FOUND is returned.
0	0	1	1	0	All immediate parents under <i>resourceName</i> are returned.
0	0	1	1	1	Invalid setting. The setting requests a scan for only parents, but <i>resourceName</i> contains the name of a child. NWSM_DATA_SET_NOT_FOUND is returned.
0	1	0	0	0	All children under <i>resourceName</i> are returned (with fully qualified paths).
0	1	0	0	1	Only 1 child with a fully qualified path is returned.
0	1	0	1	0	All children under <i>resourceName</i> are returned (with fully qualified paths).
0	1	0	1	1	Only one child with a fully qualified path is returned.
0	1	1	0	0	Invalid setting. The setting is requesting both a child only and parent only scan. NWSM_INVALID_PARAMETER is returned.
0	1	1	0	1	Invalid setting. The setting is requesting both a child only and parent only scan. NWSM_INVALID_PARAMETER is returned.
0	1	1	1	0	Invalid setting. The setting is requesting both a child only and parent only scan. NWSM_INVALID_PARAMETER is returned.
0	1	1	1	1	Invalid setting. The setting is requesting both a child only and parent only scan. NWSM_INVALID_PARAMETER is returned.
1	0	0	0	0	All directories, subdirectories, and files are returned (parents return with full paths and children return with only the terminal name).

CNO	CO	PO	DNT	IC	Data Sets or Completion Code Returned by the Scanning Functions ¹
1	0	0	0	1	The scan requests one data set (<i>resourceName</i> contains the name of a child). NWSMTSScanDataSetBegin returns the parent (with a full path). NWSMTSScanNextDataSet returns the child (without a full path).
1	0	0	1	0	All children and immediate parents under <i>resourceName</i> are returned. Parents are returned with full paths and children are returned with terminal names only. Distant parents are not returned.
1	0	0	1	1	The setting requests one data set (<i>resourceName</i> contains the name of a child). NWSMTSScanDataSetBegin returns the parent with a full path. NWSMTSScanNextDataSet returns the child without a full path.
1	0	1	0	0	All immediate and distant parents are returned with full paths.
1	0	1	0	1	Invalid setting. The setting requests a scan of parents only, but <i>resourceName</i> contains the name of a child. NWSM_DATA_SET_NOT_FOUND is returned.
1	0	1	1	0	All immediate parents are returned with full paths (distant parents are not returned because DNT is TRUE).
1	0	1	1	1	Invalid setting. The setting requests a scan of parents only, but <i>resourceName</i> contains the name of a child. NWSM_DATA_SET_NOT_FOUND is returned.
1	1	0	0	0	Invalid setting. The setting requests to return all children, below <i>resourceName</i> , without any path information (except for the children's name). The request is invalid because there is no path information. Without the path information, there is no way to restore the data sets to their original locations in the file system tree. NWSM_INVALID_PARAMETER is returned.
1	1	0	0	1	Invalid setting. The setting requests to return one child without its path information (except for the child's name). The request is invalid because there is no path information. Without the path information, there is no way to restore the child to its original locations in the file system tree. NWSM_INVALID_PARAMETER is returned.

CNO	CO	PO	DNT	IC	Data Sets or Completion Code Returned by the Scanning Functions ¹
1	1	0	1	0	Invalid setting. The setting requests to return all children, immediately below <i>resourceName</i> , without any path information (except for the children's name). The request is invalid because there is no path information. Without the path information, there is no way to restore the data sets to their original locations in the file system tree. NWSM_INVALID_PARAMETER is returned.
1	1	0	1	1	Invalid setting. The setting requests to return one child without its path information (except for the child's name). The request is invalid because there is no path information. Without the path information, there is no way to restore the child to its original locations in the file system tree. NWSM_INVALID_PARAMETER is returned.
1	1	1	0	0	Invalid setting. The setting is requesting both a child only and parent only scan. NWSM_INVALID_PARAMETER is returned.
1	1	1	0	1	Invalid setting. The setting is requesting both a child only and parent only scan. NWSM_INVALID_PARAMETER is returned.
1	1	1	1	0	Invalid setting. The setting is requesting both a child only and parent only scan. NWSM_INVALID_PARAMETER is returned.
1	1	1	1	1	Invalid setting. The setting is requesting both a child only and parent only scan. NWSM_INVALID_PARAMETER is returned.

NWSM_SELECTION_LIST

NWSM_SELECTION_LIST is used with NWSM_SCAN_CONTROL to specify how the data sets are scanned. It contains the names of the data set the user wants to access during the scan (see "Selection Type Options" in Chapter 1). Figure B-2 shows the list's structure.