The Archiver

Using the nnsarc.exe Archiver

Version 1.0.0

Contents

Revision History

Version	Revision Date	Description
1.0.0	11/10/2004	Added explanation of compression incompatibility in chapter 2.
0.1.0	06/10/2004	Initial version.

1 Introduction

NITRO-System has a general-purpose archiver called `nnsarc`, which can be used to collect small data files into a single file. This document explains `nnsarc`. To learn about the format of archives, see the Archive Format Manual (`ArchiveFormat.pdf`).

2   Using the Archiver

The `nnsarc` archiver is a Windows command line tool that combines multiple files into a single file called an archive. The `nnsarc` archiver has a hierarchical directory structure, so the directory structure on the PC's file system can be stored in the archive without change.

This `nnsarc` cannot compress archives. To compress an archive, use a compression tool such as `ntrcomp`, provided with NITRO-SDK.

2.1   Command Line Syntax

The following syntax is used with `nnsarc`:

```
Nnsarc [Mode][Options] Archive name [File names or Directory names ...]
```

`Mode` and `Options` can be specified in any order, even after the archive name, file names, and directory names.

The first name specified on the command line (excluding the command name, the mode, and options and options parameters) is taken for the archive name. If a file extension is omitted for the archive name, the default extension `.narc` is added.

`nnsarc` does not distinguish between uppercase and lowercase letters for file names and directory names. Either the slash or the backslash (in Japanese fonts, the ¥ symbol) can be used as a delimiter.

```
data/scene1/picture.dat        A path defined using slashes.
data\scene1\picture.dat        A path defined using backslashes (¥ symbols).
```

You can follow a directory name with a slash or a backslash. This indicates that the name describes a directory, not a file, so the task that checks for this is omitted and the process assumes that the name is a directory.

```
data/screen1        Describes the path for either a file or a directory.
data/screen1/       Describes the path for a directory. (If it is not a directory, an error occurs)
```

2.1.1   Syntax for Modes and Options

Modes and options can be specified using either their short names, which consist of single letters, or their long names, which are English-language words. The effect is the same, whichever type of name is used.

2.1.1.1   Short Names

Short names are specified using a hyphen followed by the single letter that has been defined for each of the different modes and options. In the example below, both lines function the same way:

```
nnsarc -r -u -l archive.narc dir
nnsarc -rul archive.narc dir
```

If an option has a parameter, insert a space between the option name and the parameter name. Specify only one parameter at a time this way.

```
nnsarc -c archive.narc dir -E CVS -E config
```

2.1.1.2　　Long Names

Two hyphens are placed in front of a long name in order to distinguish it from a series of short names. If an option has a parameter, insert an equal sign (=) between the option name and the parameter name without any spaces. Use commas to list multiple option parameters.

```
nnsarc --create archive.narc dir --exclude=CVS,config,test
```

2.2　　Lists of Modes and Options

This section provides simple explanations of all of the modes and options that can be specified with `nnsarc`.

2.2.1　　nnsarc's Modes

nnsarc has five mode types. Only one mode can be specified at a time. If more than one mode is specified, the final mode specified becomes the active mode.

-r	--replace	Replaces the files in an archive
-c	--create	Creates a new archive
-d	--delete	Deletes files in an archive
-x	--extract	Extracts all files in an archive
-p	--compare	Compares the content of an archive with the content of a specified file or directory

2.2.2　　nnsarc's Options

nnsarc has the options listed below. Some of these options are not valid in certain modes.

-a	--add-to-root	Places the contents of the specified file or directory directly below the archive's root directory.
-b	--backup	If an archive with the same name exists, saves the file as a backup file and then outputs a new archive.
-e	--remove-empty-dir	Deletes any empty directories that are inside the archive.
-h	--help	Shows the Help screen and quit execution of the archiver.
-i	--index	Outputs a C-language file ID definitions header file.
-l	--list	Displays a list of all directories and files in the archive (output to Standard output).
-n	--no-name-table	Does not output a Filename Table to the archive. When this option is selected, the Filename Table contains only the root directory.
-f	--long-symbol	Specify this at the same time as the -i option to use the long name created from the file's path name for the constant name of the file ID definitions header file.

`-s  --sort`	Sorts the files in the archive directory in alphabetical order.
`-t  --time`	Compares the time stamp of the specified file or directory with that of the archive, and updates only if the archive is older.
`-u  --update`	This option is valid only with `-r` mode. When the option is specified, all files already in the archive are updated, but no new files are added to the archive.
`-v  --verbose`	Shows the progress of the process.
`-D  dir --directory=dir`	Makes the directory specified by `dir` the working directory. Entered files that are specified with a relative path on the command line get processed as a relative path from this directory.
`-S  file --script=file[,file]`	Gets the archive's input file from the script file specified by file.
`-E  name --exclude=name[,name]`	Does not store a file or directory in the archive file if its name is the same as that specified by *name*.
`-P  name --prefix=name`	Specify this at the same time as the `-i` option to use the specified name as the prefix for the file ID definitions name.

3　Features for Creating Archives

3.1　Creating a New Archive

To create a new archive, specify the `-c` (`--create`) mode. In this mode, if a file with the same name as the archive you are trying to create already exists, that file is deleted and then the new archive is created.

The contents of the files and directories that are specified after the archive name get stored in the newly created archive. When a directory is specified, all files in that directory get stored in the archive in the same hierarchy in which they exist in the directory.

3.2　Updating an Archive

To update an archive, specify the `-r` (`--replace`) mode. In this mode, the specified archive is first loaded and the contents of the specified file or directory are updated. If the specified file does not exist in the archive, it gets added to the archive, except when the update option `-u` (`--update`) is also set at this time. If the specified archive does not exist, it gets newly created in a process that operates just like `-c` mode.

3.3　Creating Backup Files

When the `-b` (`--backup`) option is specified, if a file has the same name as the archive name, that file is saved as a backup file instead of being deleted. The file has the same name as the archive, but with the `.bak` extension.

3.4　Specifying Where to Store Archives

`nnsarc` normally uses the specified path name for the archive's path name. Thus, if, for example, the directory is specified as `data/picture/`, as shown below, then the contents under that directory get stored in the archive under the `/data/picture/` directory.

```
nnsarc -c archive.narc data/picture/
```

However, when the `-a` (`--add-to-root`) option is specified, the contents of the specified file or directory get stored in the archive's root directory. In the above example, the contents of the `data/picture/` directory would get stored in the archive's root directory. (The hierarchical structure inside the `data/picture/` directory would be maintained.)

3.5　Sorting Files

If the `-s` (`--sort`) option is specified when `nnsarc` creates an archive, the files inside the archive get sorted in alphabetical order. If the `-s` option is specified when an archive is being updated, all files in all directories get sorted, and not just those in the updated directories.

3.6   Changing the Current Directory

When `nnsarc` starts, it treats the operating system's current directory as the working directory. When a file or directory is specified on the `nnsarc` command line with a relative path, that path takes the form of a relative path from the working directory. The working directory can be changed by specifying the `-D` (`--directory`) option. This `-D` option can be set any number of times, but whenever a location is specified with this option, all subsequently described files and directories take this relative path until the option is changed again.

3.7   Specifying Files Using Script Files

With `nnsarc`, you can use a script file to specify the files and directories you want to store in an archive. The script file is specified using the `-S` (`--script`) option. Any number of script files can be specified, even at the same time that you specify files and directories on the command line.

3.7.1   Describing a Script File

Each line of the script file describes the information for a single file or directory. The information describes the path name on the PC, followed by the path name inside the archive. Path names must be contained within double quotations and separated by commas. The path name for inside the archive can be omitted. If this is done, the path name on the PC is used for the path name inside the archive. Anything after a semicolon (`;`) is treated as a comment.

Here is an example of a script file:

```
; Sample script
"D:\home\project\picture\data1", "/picture/data1"    ; Absolute path
"project\sound\data1",           "/sound/data1"      ; Relative path
"D:\home\project\picture\data1"                      ; Omit the archive name
```

The path name on the PC can be described as either an absolute path or a relative path. If a relative path has been specified, it is handled as a relative path from the directory where the script file is located. Path elements can be demarcated using either a slash or a backslash (`\`).

3.8   Excluding Names

`nnsarc` can exclude files and directories with specified names when storing the contents of a directory in an archive. Use the `-E` (`--exclude`) option to specify the name you want to exclude. This option is valid only inside the specified directory and does not apply to file names and directory names that the user has directly specified on the command line or in a script file.

One way to use the `-E` option is to exclude all files and directories so that only the data you want to store gets stored in the archive, like when the Version Management System CVS creates a CVS directory. You cannot use regular expressions with `-E` (`--exclude`).

3.9   Archives Without Filename Tables

Use the `-n` (`--no-file-table`) option to create an archive that does not include a Filename Table. When this option is specified, `nnsarc` creates only the root directory in the archive's Filename Table block. In this case, the size of the block is 16 bytes.

When an archive is created with this option, you cannot access the files in the archive using a path name; the only way to access a file is with its file ID.

Moreover, if the archive does not have a Filename Table, its files cannot be updated when the mode is set to update mode (the behavior is the same as for "Create New").

3.10   Checking Time of Latest Update

If the `-t` (`--time`) option is specified when an archive is created, the time stamp of the specified files and directories are compared with the time stamp of the archive, and the archive is created only if it is older.

The actual operation of the `-t` option differs slightly, depending on whether `nnsarc` is operating in create-new mode (`-c`) or update mode (`-r`).

3.10.1 Operating in Create-New Mode

When `nnsarc` is set to create-new mode (`-c`), it normally does not load the previously created archive. But when the `-t` option is specified, it reads this archive and checks the following items. It only creates a new archive if one of the following conditions applies:

- The time of update of a specified file is compared with that of the archive and found to be more recent than the archive.
- A file that does not exist in the archive has been specified (i.e., there are additional files).
- The archive has more files than the number specified (i.e., files have been deleted).

Note that this check is conducted only on files. If an empty directory has been added or deleted, the check is not conducted. Also note that the check for a deleted file may be erroneous if the same file is specified multiple times on the command line.

3.10.2 Operating in Update Mode

In update mode (`-r`), the `-t` option operates differently depending on whether or not the specified file exists inside the archive. If the file exists, its time of update is compared with that of the archive and the file is updated only if it is newer than the archive. If the specified file does not exist in the archive, it gets added to the archive without performing a date comparison. (If the `-u` option has been specified, the file does not get added to the archive.)

Note that this check is performed only on files. If an empty directory has been added, the check is not performed.

4 Features Other than Creating Archives

4.1 Deleting Files in Archives

Use -d (--delete) mode to delete specified files and directories from inside an archive. If a directory is specified for deletion, the files inside that directory are also deleted. If the -e (--remove-empty-dir) option is specified, a directory that becomes empty due to the deletion of files in the archive is also automatically deleted.

When specifying a file or directory for deletion, note that an absolute path is assumed in the archive for any file name or directory name that begins with a slash (or a backslash).

4.2 Extracting Files from Archives

Use -x (--extract) mode to extract the files inside an archive. In this mode, all files in the archive are expanded inside the specified directory. If a directory name is omitted, the name of the archive is used, minus the file extension.

If a directory of the specified name already exists, a new directory is created that has the specified name, followed by a dot (.) and a numeral, and the files are expanded inside this newly created directory. If a directory still cannot be created after nine name changes, an error is generated.

4.2.1 Re-Archiving Extracted Content

You can recreate an archive for files that have been extracted in -x mode by using -c mode with the -a option.

```
nnsarc -x  archive1.narc ExtractDir
nnsarc -ca archive2.narc ExtractDir
```

If you do not specify the -a option at this time, the extraction-target directory ExtractDir gets placed into the root directory of the created archive archive2.narc.

4.3 Comparing Files with Files in Archives

Use -p (--compare) mode when you want to compare files on the PC with files in an archive. In this mode, nnsarc checks whether the specified files or the files in the specified directory are the same as the files in the archive.

4.4 Outputting the File ID Definitions Header File

Run nnsarc with the -i (--index) option to output a C-language header file that defines the file ID. This file ID definitions header file is given the same name as the archive, but with the file extension changed to .naix.

4.4.1   File ID Constant Name

The file ID is defined as an `enum` type constant. By default, the constant name is created from the archive
name and the file name. For example, if the archive name is `archive` and the file's path name is
`/scene/picture/data-1.bin` then the constant name becomes:

```
enum {
   NARC_archive_data_1_bin = 0,
   ......
};
```

If the archive name or the file name includes a character that cannot be used as a C-language symbol, that
character is replaced by an underscore.

If file names overlap, use the `-f` (`--long-symbol`) option to create the constant name from the path name
instead of from the file name.

```
enum {
   NARC_archive_scene_picture_data_1_bin = 0,
   ......
};
```

4.4.2   Constant Name Prefix

Constant names are prefixed with `NARC_` so they do not overlap user-defined symbols. Use `nnsarc` with
the `-P` (`--prefix`) option to change this prefix.

If you specify the prefix like this:

```
nnsarc -i -P ABC_ archive.narc
```

the constant name looks like this:

```
enum {
   ABC_archive_data_1_bin = 0,
   ......
};
```

Windows is a registered trademark of Microsoft Corporation in the U.S. and other nations.

All other company names and product names are registered trademarks or trademarks of those companies.