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<table>
<thead>
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<th>Revision Number</th>
<th>Description</th>
<th>Revision Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.0</td>
<td>Initial UEFI release</td>
<td>9/25/08</td>
</tr>
</tbody>
</table>
1 Introduction

1.1 Overview

The UEFI Shell environment provides an API, a command prompt and a rich set of commands that extend and enhance the UEFI Shell's capability.

1.2 Related Information

The following publications and sources of information may be useful or are referred to by this document:


1.3 Terms

EFI

Generic term that refers to one of the versions of the EFI specification: EFI 1.02, EFI 1.10, or UEFI 2.0.

EFI 1.10 Specification

Intel Corporation published the Extensible Firmware Interface Specification. It has been supplanted by the Unified Extensible Firmware Interface (UEFI), which is controlled by the UEFI Forum.

GUID

Globally Unique Identifier. A 128-bit value used to name entities uniquely. Without the help of a centralized authority, an individual can generate a unique GUID. This allows the generation of names that will never conflict, even among multiple, unrelated parties.

Protocol

An API named by a GUID as defined by the UEFI specification.
**UEFI Application**

An application following the UEFI specification. The only difference between a UEFI application and a UEFI driver is that an application is unloaded from memory when it exits regardless of return status, while a driver that returns a successful return status is not unloaded when its entry point exits.

**UEFI Driver**

A driver following the UEFI specification driver model.

**UEFI Specification Version 2.0**

The first UEFI specification released by the Unified EFI Forum.

**UEFI Specification Version 2.1**

Current version of the UEFI specification released by the Unified EFI Forum.

**Unified EFI Forum**

A non-profit collaborative trade organization formed to promote and manage the UEFI standard. For more information, see www.uefi.org.
2 Code Definitions

2.1 Introduction

2.2 EFI_SHELL_PROTOCOL

EFI_SHELL_PROTOCOL

Summary

Provides shell services to UEFI applications.
```
#define EfiShellProtocolGuid \
{ 0x6302d008, 0x7f9b, 0x4f30, \
{ 0x87, 0xac, 0x60, 0xc9, 0xfe, 0xf5, 0xda, 0x4e } }

Protocol Interface Structure
typedef struct _EfiShellProtocol {
    EfiShellExecute        Execute;
    EfiShellGetEnv         GetEnv;
    EfiShellSetEnv         SetEnv;
    EfiShellSetAlias       SetAlias;
    EfiShellGetHelpText    GetHelpText;
    EfiShellGetDevicePathFromMap GetDevicePathFromMap;
    EfiShellGetMapFromDevicePath GetMapFromDevicePath;
    EfiShellGetDevicePathFromFilePath GetDevicePathFromFilePath;
    EfiShellGetFilePathFromDevicePath GetFilePathFromDevicePath;
    EfiShellGetDeviceName GetDeviceName;
    EfiShellGetFileInfo GetFileInfo;
    EfiShellSetFileInfo SetFileInfo;
    EfiShellOpenFileByName OpenFileByName;
    EfiShellCloseFile CloseFile;
    EfiShellCreateFile CreateFile;
    EfiShellReadFile ReadFile;
    EfiShellWriteFile WriteFile;
    EfiShellDeleteFile DeleteFile;
    EfiShellDeleteFileByName DeleteFileByName;
    EfiShellGetFileSize GetFileSize;
    EfiShellOpenRoot OpenRoot;
    EfiShellOpenRootByHandle OpenRootByHandle;
    EfiEvent ExecutionBreak;
    Uint32 MajorVersion;
    Uint32 MinorVersion;
} EfiShellProtocol;

Members
Execute
```

Causes the shell to parse and execute the command line. See the `Execute()` function description below.

`GetEnv`

Gets the environment variable. See the `GetEnv()` function description below.

`SetEnv`

Changes a specific environment variable. Set the `SetEnv()` function description below.

`SetAlias`

Adds or removes the alias for a specific shell command. See the `SetAlias()` function description below.

`GetDevicePathFromMap`

Returns the device path that corresponds to a mapping. See the `GetDevicePathFromMap()` function description below.

`GetMapFromDevicePath`

Returns the mapping that corresponds to a particular device path. See the `GetMapFromDevicePath()` function description below.

`GetDevicePathFromFilePath`

Converts a file path to a device path, where all mappings have been replaced with the corresponding device paths.

`GetFilePathFromDevicePath`

Converts a device path to a file path, where the portion of the device path corresponding to one of the mappings is replaced with that mapping.

`SetMap`

Creates, updates or deletes a mapping between a device and a device path.

`GetCurDir`

Returns the current directory on a device. See the `GetCurDir()` function description below.

`SetCurDir`

Changes the current directory on a device. Set the `SetCurDir()` function description below.

`OpenFileList`

Opens the files that match the path pattern specified. See the `OpenFileList()` function description below.

`FreeFileList`

Frees the file list that created by `OpenFileList()`. See the `FreeFileList()` function description below.

`RemoveDupInFileList`

Deletes the duplicate files in the given file list. See the `RemoveDupInFileList()` function description below.

`BatchIsActive`

Returns whether any script files are currently being processed. See the `BatchIsActive()` function description below.
IsRootShell
Judges whether the active Shell is the root shell. See the IsRootShell() function description below.

EnablePageBreak
Enables the page break output mode. See the EnablePageBreak() function description below.

DisablePageBreak
Disables the page break output mode. See the DisablePageBreak() function description below.

GetPageBreak
Gets the enable status of the page break output mode. See the GetPageBreak() function description below.

GetDeviceName
Gets the name of the device specified by the device handle. See the GetDeviceName() function description below.

GetFileInfo
Return information about a specific file handle. See the GetFileInfo() function description below.

SetFileInfo
Change information about a specific file handle. See the SetFileInfo() function description below.

OpenFileByName
Given a file name, open a file and return a file handle. See the OpenFileByName() description below.

CloseFile
Close an open file. See the CloseFile() description below.

CreateFile
Create a new file. See the CreateFile() function description.

ReadFile
Read data from a file. See the ReadFile() function description.

WriteFile
Write data to a file. See the WriteFile() function description.

DeleteFile
Delete a file. See the DeleteFile() function description.

DeleteFileByName
Delete a file by name. See the DeleteFileByName() function description.

SetFilePosition
Change the current read/write position within a file. See the SetFilePosition() function description.
GetFilePosition
Return the current read/write position within a file. See the GetFilePosition() function description.

FlushFile
Write all buffered data to a file. See the FlushFile() function description.

FindFiles
Return all files that match a pattern in a file list. See the FindFiles() function description.

FindFilesInDir
Return all files in a specified directory in a file list. See the FindFilesInDir() function description.

GetFileSize
Return the size of a file. See the GetFileSize() function description.

OpenRoot
Return the root directory of a file system. See the OpenRoot() function description.

OpenRootByHandle
Return the root directory of a file system on a particular handle. See the OpenRootByHandle() function description.

ExecutionBreak
Event signaled by the UEFI Shell when the user presses CTRL-C to indicate that the current UEFI Shell command execution should be interrupted.

MajorVersion
The major version of the shell environment.

MinorVersion
The minor version of the shell environment.

Description
Description that is more detailed goes here.
**EFI_SHELL_PROTOCOL.BatchIsActive()**

**Summary**

Returns whether any script files are currently being processed.

**Prototype**

```c
typedef BOOLEAN (EFIAPI *EFI_SHELL_BATCH_IS_ACTIVE) (VOID);
```

**Parameters**

None

**Description**

This function tells whether any script files are currently being processed.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUE</td>
<td>There is at least one script file active.</td>
</tr>
<tr>
<td>FALSE</td>
<td>No script files are active now.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.CloseFile()**

**Summary**
Closes the file handle.

**Prototype**
```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_CLOSE_FILE)(
    IN EFI_FILE_HANDLE   FileHandle
);
```

**Parameters**
- **FileHandle**
  The file handle to be closed

**Description**
This function closes a specified file handle. All "dirty" cached file data is flushed to the device, and the file is closed. In all cases, the handle is closed.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFI_SUCCESS</strong></td>
<td>The file is closed successfully</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.CreateFile()**

**Summary**

Creates a file or directory by name.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_CREATE_FILE)(
    IN  CONST CHAR16  *FileName,
    IN  UINT64        FileAttribs,
    OUT EFI_FILE_HANDLE *FileHandle
);
```

**Parameters**

- **FileName**
  Points to the null-terminated file path.

- **FileAttribs**
  The new file’s attributes. The different attributes are described in `EFI_FILE_PROTOCOL.Open()`.

- **FileHandle**
  On return, points to the created file or directory’s handle.

**Description**

This function creates an empty new file or directory with the specified attributes and returns the new file’s handle. If the file already exists and is read-only, then `EFI_INVALID_PARAMETER` will be returned.

If the file already existed, it is truncated and its attributes updated. If the file is created successfully, the `FileHandle` is the file’s handle, else, the `FileHandle` is `NULL`.

If the file name begins with `>v`, then the file handle which is returned refers to the shell environment variable with the specified name. If the shell environment variable already exists and is non-volatile then `EFI_INVALID_PARAMETER` is returned.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>The file was opened. <code>FileHandle</code> points to the new file’s handle.</td>
</tr>
<tr>
<td>EFI_INVALID_PARAMETER</td>
<td>One of the parameters has an invalid value.</td>
</tr>
<tr>
<td>EFI_UNSUPPORTED</td>
<td>Could not open the file path.</td>
</tr>
<tr>
<td>EFI_NOT_FOUND</td>
<td>The specified file could not be found on the device, or could not find the file system on the device.</td>
</tr>
<tr>
<td>EFI_NO_MEDIA</td>
<td>The device has no medium.</td>
</tr>
<tr>
<td><strong>EFI_MEDIA_CHANGED</strong></td>
<td>The device has a different medium in it or the medium is no longer supported.</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>EFI_DEVICE_ERROR</strong></td>
<td>The device reported an error or can't get the file path according the <code>DirName</code>.</td>
</tr>
<tr>
<td>----------------------</td>
<td>----------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>EFI_VOLUME_CORRUPTED</strong></td>
<td>The file system structures are corrupted.</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>EFI_WRITE_PROTECTED</strong></td>
<td>An attempt was made to create a file, or open a file for write when the media is write-protected.</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>EFI_ACCESS_DENIED</strong></td>
<td>The service denied access to the file.</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>EFI_OUT_OF_RESOURCES</strong></td>
<td>Not enough resources were available to open the file.</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>EFI_VOLUME_FULL</strong></td>
<td>The volume is full.</td>
</tr>
<tr>
<td>----------------------</td>
<td>--------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.DeleteFile()**

**Summary**

Deletes the file specified by the file handle.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_DELETE_FILE)(
    IN EFI_FILE_HANDLE FileHandle
);
```

**Parameters**

*FileHandle*

The file handle to delete.

**Description**

This function closes and deletes a file. In all cases, the file handle is closed. If the file cannot be deleted, the warning code `EFI_WARN_DELETE_FAILURE` is returned, but the handle is still closed.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>EFI_SUCCESS</code></td>
<td>The file was closed and deleted, and the handle was closed.</td>
</tr>
<tr>
<td><code>EFI_WARN_DELETE_FAILURE</code></td>
<td>The handle was closed but the file was not deleted.</td>
</tr>
</tbody>
</table>
EFI_SHELL_PROTOCOL.DeleteFileByName()

**Summary**

Deletes the file specified by the file handle.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_DELETE_FILE_BY_NAME)(
    IN CONST CHAR16   *FileName
);
```

**Parameters**

*FileName*

Points to the null-terminated file name.

**Description**

This function deletes a file.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>The file was closed and deleted, and the handle was closed.</td>
</tr>
<tr>
<td>EFI_WARN_DELETE_FAILURE</td>
<td>The handle was closed but the file was not deleted.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.DisablePageBreak()**

**Summary**

Disables the page break output mode.

**Prototype**

```c
typedef void (EFIAPI *EFI_SHELL_DISABLE_PAGE_BREAK) (VOID);
```

**Parameters**

None

**Description**

This function disables the page break output mode.

**Status Codes Returned**

None
**EFI_SHELL_PROTOCOL.EnablePageBreak()**

**Summary**

Enables the page break output mode.

**Prototype**

```c
typedef VOID
(EFI_API *EFI_SHELL_ENABLE_PAGE_BREAK) (VOID);
```

**Parameters**

None

**Description**

This function enables the page break output mode.

**Status Codes Returned**

None
**EFI_SHELL_PROTOCOL.Execute()**

**Summary**

Execute the command line.

**Prototype**

```c
typedef EFI_STATUS
  (EFIAPI *EFI_SHELL_EXECUTE) (  
    IN  EFI_HANDLE    *ParentImageHandle,  
    IN  CHAR16        *CommandLine OPTIONAL,  
    IN  CHAR16        **Environment OPTIONAL,  
    OUT EFI_STATUS    *StatusCode OPTIONAL  
  );
```

**Parameters**

- **ParentImageHandle**
  A handle of the image that is executing the specified command line.

- **CommandLine**
  Points to the null-terminated UCS-2 encoded string containing the command line. If NULL then the command-line will be empty.

- **Environment**
  Points to a null-terminated array of environment variables with the format 'x=y', where x is the environment variable name and y is the value. If this is NULL, then the current shell environment is used.

- **ErrorCode**
  Points to the status code returned by the command.

**Description**

This function creates a nested instance of the shell and executes the specified command (*CommandLine*) with the specified environment (*Environment*). Upon return, the status code returned by the specified command is placed in *StatusCode*.

If *Environment* is **NULL**, then the current environment is used and all changes made by the commands executed will be reflected in the current environment. If the *Environment* is non-**NULL**, then the changes made will be discarded.

The *CommandLine* is executed from the current working directory on the current device.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>EFI_SUCCESS</th>
<th>The command executed successfully. The status code returned by the command is</th>
</tr>
</thead>
</table>

16
<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_INVALID_PARAMETER</td>
<td>The parameters are invalid.</td>
</tr>
<tr>
<td>EFI_OUT_OF_RESOURCES</td>
<td>Out of resources.</td>
</tr>
<tr>
<td>EFI_UNSUPPORTED</td>
<td>Nested shell invocations are not allowed.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.FindFiles()**

**Summary**
Find files that match a specified pattern.

**Prototype**
```
typedef
EFI_STATUS
(EFIAPI *EFI_SHELL_FIND_FILES)(
    IN  CONST CHAR16        *FilePattern,
    OUT EFI_SHELL_FILE_INFO **FileList
);
```

**Parameters**
- **FilePattern**
  Points to a null-terminated shell file path, including wildcards.
- **FileList**
  On return, points to the start of a file list containing the names of all matching files or else points to NULL if no matching files were found.

**Description**
This function searches for all files and directories that match the specified `FilePattern`. The `FilePattern` can contain wild-card characters. The resulting file information is placed in the file list `FileList`.

The files in the file list are not opened. The OpenMode field is set to 0 and the FileInfo field is set to NULL.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>Files found.</td>
</tr>
<tr>
<td>EFI_NOT_FOUND</td>
<td>No files found.</td>
</tr>
<tr>
<td>EFI_NO_MEDIA</td>
<td>The device has no media</td>
</tr>
<tr>
<td>EFI_DEVICE_ERROR</td>
<td>The device reported an error</td>
</tr>
<tr>
<td>EFI_VOLUME_CORRUPTED</td>
<td>The file system structures are corrupted</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.FindFilesInDir()**

**Summary**

Find all files in a specified directory.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_FIND_FILES_IN_DIR)(
    IN  EFI_FILE_HANDLE  FileDirHandle,
    OUT EFI_SHELL_FILE_INFO **FileList
);
```

**Parameters**

- `FileDirHandle`
  Handle of the directory to search.

- `FileList`
  On return, points to the list of files in the directory or NULL if there are no files in the directory.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>File information was returned successfully.</td>
</tr>
<tr>
<td>EFI_VOLUME_CORRUPTED</td>
<td>The file system structures have been corrupted.</td>
</tr>
<tr>
<td>EFI_DEVICE_ERROR</td>
<td>The device reported an error.</td>
</tr>
<tr>
<td>EFI_NO_MEDIA</td>
<td>The device media is not present.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.FlushFile()**

**Summary**
Flushes data back to a device

**Prototype**

typedef
EFI_STATUS
(EFIAPIC *EFI_SHELL_FLUSH_FILE)(
    IN EFI_FILE_HANDLE FileHandle
);

**Parameters**

*FileHandle*
The handle of the file to flush.

**Description**
This function flushes all modified data associated with a file to a device.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>The data was flushed.</td>
</tr>
<tr>
<td>EFI_NO_MEDIA</td>
<td>The device has no medium.</td>
</tr>
<tr>
<td>EFI_DEVICE_ERROR</td>
<td>The device reported an error.</td>
</tr>
<tr>
<td>EFI_VOLUME_CORRUPTED</td>
<td>The file system structures are corrupted.</td>
</tr>
<tr>
<td>EFI_WRITE_PROTECTED</td>
<td>The file or medium is write-protected.</td>
</tr>
<tr>
<td>EFI_ACCESS_DENIED</td>
<td>The file was opened read-only.</td>
</tr>
<tr>
<td>EFI_VOLUME_FULL</td>
<td>The volume is full.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.FreeFileList()**

**Summary**

Frees the file list.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_FREE_FILE_LIST) (
    IN EFI_SHELL_FILE_INFO **FileList
);
```

**Parameters**

- **FileList**
  
  The file list to free. Type EFI_SHELL_FILE_INFO is defined in OpenFileList()

**Description**

This function cleans up the file list and any related data structures. It has no impact on the files themselves.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFI_SUCCESS</strong></td>
<td>Free the file list successfully.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.GetCurDir()**

**Summary**

Returns the current directory on the specified device.

**Prototype**

```c
typedef CONST CHAR16 * (EFIAPIC *EFI_SHELL_GET_CUR_DIR) (IN CONST CHAR16 *FileSystemMapping OPTIONAL);
```

**Parameters**

- **FileSystemMapping**
  
  A pointer to the file system mapping. If **NULL**, then the current working directory is returned.

**Description**

If **FileSystemMapping** is **NULL**, it returns the current working directory. If the **FileSystemMapping** is not **NULL**, it returns the current directory associated with the **FileSystemMapping**. In both cases, the returned name includes the file system mapping (i.e. `fs0:\current-dir`).

For more information, see “Current Directory”, section 3.5.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>≠NULL</td>
<td>The current directory.</td>
</tr>
<tr>
<td>NULL</td>
<td>Current directory does not exist.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.GetDeviceName()**

**Summary**

Gets the name of the device specified by the device handle.

**Prototype**

```c
typedef EFI_STATUS (*EFI_SHELL_GET_DEVICE_NAME) (  
    IN  EFI_HANDLE DeviceHandle,  
    IN  EFI_SHELL_DEVICE_NAME_FLAGS Flags,  
    IN  CHAR8 *Language,  
    OUT CHAR16 **BestDeviceName  
);
```

**Parameters**

- **DeviceHandle**
  The handle of the device.

- **Flags**
  Determines the possible sources of component names. See "Related Definitions" below for more information.

- **Language**
  A pointer to the language specified for the device name, in the same format as described in the UEFI specification, Appendix M

- **BestDeviceName**
  On return, points to the callee-allocated null-terminated name of the device. If no device name could be found, points to NULL. The name must be freed by the caller.

**Description**

This function gets the user-readable name of the device specified by the device handle. If no user-readable name could be generated, then *BestDeviceName will be NULL and EFI_NOT_FOUND will be returned.

**Related Definitions**

```c
typedef UINT32 EFI_DEVICE_NAME_FLAGS;
#define EFI_DEVICE_NAME_USE_COMPONENT_NAME 0x00000001
#define EFI_DEVICE_NAME_USE_DEVICE_PATH    0x00000002
```

If **EFI_DEVICE_NAME_USE_COMPONENT_NAME** is set, then the function will return the device’s name using the **EFI_COMPONENT_NAME2_PROTOCOL**, if present on **DeviceHandle**.
If `EFI_DEVICE_NAME_USE_DEVICE_PATH` is set, then the function will return the device's name using the `EFI_DEVICE_PATH_PROTOCOL`, if present on `DeviceHandle`.

If both `EFI_DEVICE_NAME_USE_COMPONENT_NAME` and `EFI_DEVICE_NAME_USE_DEVICE_PATH` are set, then `EFI_DEVICE_NAME_USE_COMPONENT_NAME` will have higher priority.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>Get the name successfully.</td>
</tr>
<tr>
<td>EFI_NOT_FOUND</td>
<td>Fail to get the device name.</td>
</tr>
</tbody>
</table>
EFI_SHELL_PROTOCOL.GetDevicePathFromMap()

Summary

Gets the device path from the mapping.

Prototype

typedef
CONST EFI_DEVICE_PATH_PROTOCOL *
(EFIAPI *EFI_SHELL_GET_DEVICE_PATH_FROM_MAP) (
   IN CONST CHAR16 *Mapping
);

Parameters

Mapping
A pointer to the mapping.

Description

This function gets the device path associated with a mapping.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NULL</td>
<td>Pointer to the device path that corresponds to the device mapping. The returned pointer does not need to be freed.</td>
</tr>
<tr>
<td>NULL</td>
<td>There is no device path associated with the specified mapping.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.GetDevicePathFromFilePath()**

**Summary**

Converts a file system style name to a device path.

**Prototype**

```c
typedef EFI_DEVICE_PATH_PROTOCOL *
(EFI_API *EFI_SHELL_GET_DEVICE_PATH_FROM_FILE_PATH) (IN CONST CHAR16 *Path);
```

**Parameters**

- `Path`
  The pointer to the path.

**Description**

This function converts a file system style name to a device path, by replacing any mapping references to the associated device path.

**Status Codes Returned**

The pointer of the file path. The file path is callee allocated and should be freed by the caller.
EFI_SHELL_PROTOCOL.GetEnv()

Summary

Gets the environment variable.

Prototype

typedef
CONST CHAR16 *
(EFIAPI *EFI_SHELL_GET_ENV) (
    IN CONST CHAR16 *Name
);

Parameters

Name

A pointer to the environment variable name.

Description

This function returns the current value of the specified environment variable.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>≠NULL</td>
<td>The environment variable’s value. The returned pointer does not need to be freed by the caller.</td>
</tr>
<tr>
<td>NULL</td>
<td>The environment variable doesn’t exist.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.GetFileInfo()**

**Summary**

Gets the file information from an open file handle.

**Prototype**

```c
typedef EFI_FILE_INFO * (EFIAPI *EFI_SHELL_GET_FILE_INFO)(
    IN EFI_FILE_HANDLE  FileHandle
    );
```

**Parameters**

*FileHandle*

A file handle

**Description**

This function allocates a buffer to store the file's information. It's the caller's responsibility to free the buffer.

**Returns**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>≠NULL</td>
<td>Cannot get the file info.</td>
</tr>
<tr>
<td>NULL</td>
<td>A pointer to a buffer with file information.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.GetFilePathFromDevicePath()**

**Summary**

Converts a device path to a file system-style path.

**Prototype**

```c
typedef CHAR16 *(EFIAPI *EFI_SHELL_GET_FILE_PATH_FROM_DEVICE_PATH) (IN CONST EFI_DEVICE_PATH_PROTOCOL *Path);
```

**Parameters**

- **Path**
  
  The pointer to the device path.

**Description**

This function converts a device path to a file system path by replacing part, or all, of the device path with the file-system mapping. If there are more than one application file system mappings, the one that most closely matches `Path` will be used.

**Returned Value**

The pointer of the null-terminated file path. The path is callee-allocated and should be freed by the caller.
**EFI_SHELL_PROTOCOL.GetFilePosition()**

**Summary**

 Gets a file’s current position

**Prototype**

```c
typedef
EFI_STATUS
(EFIAPI *EFI_SHELL_GET_FILE_POSITION)(
  IN  EFI_FILE_HANDLE  FileHandle,
  OUT UINT64           *Position
);
```

**Parameters**

- **FileHandle**
  The file handle on which to get the current position.
- **Position**
  Byte position from the start of the file

**Description**

This function returns the current file position for the file handle. For directories, the current file position has no meaning outside of the file system driver and as such, the operation is not supported.

**Status Codes Returns**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>Data was accessed.</td>
</tr>
<tr>
<td>EFI_UNSUPPORTED</td>
<td>The request is not valid on open directories.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.GetFileSize()**

**Summary**

Gets the size of a file.

**Prototype**

```c
typedef EFI_STATUS
(EIFIAPI *EFI_SHELL_GET_FILE_SIZE)(
    IN  EFI_FILE_HANDLE FileHandle,
    OUT UINT64           *Size
);
```

**Parameters**

- **FileHandle**
  
  The handle of the file.

- **Size**
  
  The size of this file.

**Description**

This function returns the size of the file specified by `FileHandle`.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>Get the file's size.</td>
</tr>
<tr>
<td>EFI_DEVICE_ERROR</td>
<td>Can't access the file.</td>
</tr>
</tbody>
</table>
EFI_SHELL_PROTOCOL.GetHelpText()

Summary

Return help information about a specific command.

Prototype

typedef
EFI_STATUS
(EIFIAPI *EFI_SHELL_GET_HELP_TEXT) (
  IN  CONST CHAR16 *Command,
  IN  CONST CHAR16 *Sections,
  OUT CHAR16 **HelpText
);

Parameters

Command
  Points to the null-terminated UEFI Shell command name.

Sections
  Points to the null-terminated comma-delimited section names to return. If NULL, then all sections will be returned.

HelpText
  On return, points to a callee-allocated buffer containing all specified help text.

Description

This function returns the help information for the specified command. The help text can be internal to the shell or can be from a UEFI Shell manual page, as described in Appendix B.

If Sections is specified, then each section name listed will be compared in a case-sensitive manner, to the section names described in Appendix B. If the section exists, it will be appended to the returned help text. If the section does not exist, no information will be returned. If Sections is NULL, then all help text information available will be returned.

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>The help text was returned.</td>
</tr>
<tr>
<td>EFI_OUT_OF_RESOURCES</td>
<td>The necessary buffer could not be allocated to hold the returned help text.</td>
</tr>
<tr>
<td>EFI_INVALID_PARAMETER</td>
<td>HelpText is NULL</td>
</tr>
<tr>
<td>EFI_NOT_FOUND</td>
<td>There is no help text available for Command.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.GetMapFromDevicePath()**

**Summary**

Gets the mapping that most closely matches the device path.

**Prototype**

```c
typedef CONST CHAR16 * (EFIAPI *EFI_SHELL_GET_MAP_FROM_DEVICE_PATH) (
    IN OUT EFI_DEVICE_PATH_PROTOCOL **DevicePath
);
```

**Parameters**

- **DevicePath**
  
  On entry, points to a device path pointer. On exit, updates the pointer to point to the portion of the device path after the mapping.

**Description**

This function gets the mapping which corresponds to the device path `*DevicePath`. If there is no exact match, then the mapping which most closely matches `*DevicePath` is returned, and `*DevicePath` is updated to point to the remaining portion of the device path. If there is an exact match, the mapping is returned and `*DevicePath` points to the end-of-device-path node.

**Returned Value**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NULL</td>
<td>Pointer to null-terminated mapping. The buffer is callee-allocated and should be freed by the caller.</td>
</tr>
<tr>
<td>NULL</td>
<td>No mapping was found.</td>
</tr>
</tbody>
</table>
EFI_SHELL_PROTOCOL.GetPageBreak()

Summary

Gets the enable status of the page break output mode.

Prototype

typedef
BOOLEAN
(EIFIAP *EFI_SHELL_GET_PAGE_BREAK) (
 VOID
 )

Parameters

None

Description

User can use this function to determine current page break mode.

Status Codes Returned

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUE</td>
<td>The page break output mode is enabled</td>
</tr>
<tr>
<td>FALSE</td>
<td>The page break output mode is disabled</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.IsRootShell()**

**Summary**

Judges whether the active shell is the root shell.

**Prototype**

```c
typedef BOOLEAN (EFIAPI *EFI_SHELL_IS_ROOT_SHELL) (VOID);
```

**Parameters**

None

**Description**

This function makes the user to know that whether the active Shell is the root shell.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRUE</td>
<td>The active Shell is the root Shell.</td>
</tr>
<tr>
<td>FALSE</td>
<td>The active Shell is NOT the root Shell.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.OpenFileByName()**

**Summary**

Opens a file or a directory by file name.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_OPEN_FILE_BY_NAME) (
  IN  CONST CHAR16     *FileName,
  OUT EFI_FILE_HANDLE  *FileHandle,
  IN  UINT64            OpenMode
);
```

**Parameters**

- **FileName**
  Points to the null-terminated UCS-2 encoded file name.

- **FileHandle**
  On return, points to the file handle.

- **OpenMode**
  File open mode. Either EFI_FILE_MODE_READ or EFI_FILE_MODE_WRITE from section 12.4 of the UEFI Specification.

**Related Definitions**

```c
typedef VOID *EFI_FILE_HANDLE;
```

**Description**

This function opens the specified file in the specified OpenMode and returns a file handle.

If the file name begins with >v, then the file handle which is returned refers to the shell environment variable with the specified name. If the shell environment variable exists, is non-volatile and the OpenMode indicates EFI_FILE_MODE_WRITE, then EFI_INVALID_PARAMETER is returned.

If the file name is >i, then the file handle which is returned refers to the standard input. If the OpenMode indicates EFI_FILE_MODE_WRITE, then EFI_INVALID_PARAMETER is returned.

If the file name is >o, then the file handle which is returned refers to the standard output. If the OpenMode indicates EFI_FILE_MODE_READ, then EFI_INVALID_PARAMETER is returned.

If the file name is >e, then the file handle which is returned refers to the standard error. If the OpenMode indicates EFI_FILE_MODE_READ, then EFI_INVALID_PARAMETER is returned.
If the file name is NUL, then the file handle that is returned refers to the standard NUL file. If the `OpenMode` indicates `EFI_FILE_MODE_READ`, then `EFI_INVALID_PARAMETER` is returned.

If return `EFI_SUCCESS`, the `FileHandle` is the opened file’s handle, else, the `FileHandle` is NULL.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>EFI_SUCCESS</code></td>
<td>The file was opened. FileHandle has the opened file's handle.</td>
</tr>
<tr>
<td><code>EFI_INVALID_PARAMETER</code></td>
<td>One of the parameters has an invalid value. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_UNSUPPORTED</code></td>
<td>Could not open the file path. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_NOT_FOUND</code></td>
<td>The specified file could not be found on the device or the file system could not be found on the device. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_NO_MEDIA</code></td>
<td>The device has no medium. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_MEDIA_CHANGED</code></td>
<td>The device has a different medium in it or the medium is no longer supported. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_DEVICE_ERROR</code></td>
<td>The device reported an error or can’t get the file path according to the <code>FileName</code>. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_VOLUME_CORRUPTED</code></td>
<td>The file system structures are corrupted. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_WRITE_PROTECTED</code></td>
<td>An attempt was made to create a file, or open a file for write when the media is write-protected. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_ACCESS_DENIED</code></td>
<td>The service denied access to the file. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_OUT_OF_RESOURCES</code></td>
<td>Not enough resources were available to open the file. FileHandle is NULL.</td>
</tr>
<tr>
<td><code>EFI_VOLUME_FULL</code></td>
<td>The volume is full. FileHandle is NULL.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.OpenFileList()**

**Summary**

Opens the files that match the path specified.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_OPEN_FILE_LIST) (
    IN     CHAR16               *Path,
    IN     UINT64               OpenMode,
    IN OUT EFI_SHELL_FILE_INFO  **FileList
);
```

**Parameters**

- **Path**
  A pointer to the path string.

- **OpenMode**
  Specifies the mode used to open each file, EFI_FILE_MODE_READ or EFI_FILE_MODE_WRITE.

- **FileList**
  Points to the start of a list of files opened.

**Description**

This function opens all of the files specified by `Path`. Wildcards are processed according to the rules specified in 3.7.1. Each matching file has an EFI_SHELL_FILE_INFO structure created in a linked list.

**Related Definitions**

```c
typedef struct _EFI_LIST_ENTRY {
    struct _EFI_LIST_ENTRY  *Flink;
    struct _EFI_LIST_ENTRY  *Blink;
} EFI_LIST_ENTRY;

typedef struct {
    EFI_LIST_ENTRY       Link;
    EFI_STATUS           Status;
    CONST CHAR16         *FullName;
    CONST CHAR16         *FileName
    EFI_FILE_HANDLE      Handle;
    EFI_FILE_INFO        *Info;
} EFI_SHELL_FILE_INFO;
```

- **Link**
  Points to the next and previous entries in the file list. If NULL, then no more files.

- **Status**
  The status returned when calling OpenFile() for the entry in the file list.
**FullName**
Specifies the full name of the file, including the path.

**Handle**
The file handle of the file after it was opened.

**Info**
The file information for the opened file.

### Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFI_SUCCESS</strong></td>
<td>Create the file list successfully.</td>
</tr>
<tr>
<td>Others</td>
<td>Can’t create the file list.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.OpenRoot()**

**Summary**

Opens the root directory of a device.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI EFI_SHELL_OPEN_ROOT)(
    IN  EFI_DEVICE_PATH_PROTOCOL *DevicePath,
    OUT EFI_FILE_HANDLE          *FileHandle
);
```

**Parameters**

- **DevicePath**
  - Points to the device path corresponding to the device where the EFI_SIMPLE_FILE_SYSTEM_PROTOCOL is installed.

- **FileHandle**
  - On exit, points to the file handle corresponding to the root directory on the device.

**Description**

This function opens the root directory of a device and returns a file handle to it.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>Root opened successfully.</td>
</tr>
<tr>
<td>EFI_NOT_FOUND</td>
<td>EFI_SIMPLE_FILE_SYSTEM could not be found or the root directory could not be opened.</td>
</tr>
<tr>
<td>EFI_VOLUME_CORRUPTED</td>
<td>The data structures in the volume were corrupted.</td>
</tr>
<tr>
<td>EFI_DEVICE_ERROR</td>
<td>The device had an error</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.OpenRootByHandle()**

**Summary**

Opens the root directory of a device on a handle

**Prototype**

```c
typedef
EFI_STATUS
(EFI_API EFI_SHELL_OPEN_ROOT_BY_HANDLE)(
  IN  EFI_HANDLE DeviceHandle,
  OUT EFI_FILE_HANDLE *FileHandle
);
```

**Parameters**

- **DeviceHandle**
  The handle of the device that contains the volume.

- **FileHandle**
  On exit, points to the file handle corresponding to the root directory on the device.

**Description**

This function opens the root directory of a device and returns a file handle to it.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>Root opened successfully.</td>
</tr>
<tr>
<td>EFI_NOT_FOUND</td>
<td>EFI_SIMPLE_FILE_SYSTEM could not be found or the root directory could not be opened.</td>
</tr>
<tr>
<td>EFI_VOLUME_CORRUPTED</td>
<td>The data structures in the volume were corrupted.</td>
</tr>
<tr>
<td>EFI_DEVICE_ERROR</td>
<td>The device had an error</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.ReadFile()**

**Summary**
Reads data from the file.

**Prototype**

```c
typedef
EFI_STATUS
(EFIAPI *EFI_SHELL_READ_FILE) (
    IN     EFI_FILE_HANDLE    FileHandle,
    IN OUT UINTN              *ReadSize,
    OUT    VOID               *Buffer
);
```

**Parameters**

- **FileHandle**
  The opened file handle for read
- **ReadSize**
  On input, the size of Buffer, in bytes. On output, the amount of data read.
- **Buffer**
  The buffer in which data is read.

**Description**

If `FileHandle` is not a directory, the function reads the requested number of bytes from the file at the file's current position and returns them in `Buffer`. If the read goes beyond the end of the file, the read length is truncated to the end of the file. The file's current position is increased by the number of bytes returned.

If `FileHandle` is a directory, then an error is returned.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>Data was read.</td>
</tr>
<tr>
<td>EFI_NO_MEDIA</td>
<td>The device has no media</td>
</tr>
<tr>
<td>EFI_DEVICE_ERROR</td>
<td>The device reported an error</td>
</tr>
<tr>
<td>EFI_VOLUME_CORRUPTED</td>
<td>The file system structures are corrupted</td>
</tr>
<tr>
<td>EFI_BUFFER_TOO_SMALL</td>
<td>Buffer is too small. <code>ReadSize</code> contains required size</td>
</tr>
</tbody>
</table>

*Version 2.0*
EFI_SHELL_PROTOCOL.RemoveDupInFileList()

Summary
Deletes the duplicate file names files in the given file list.

Prototype
typedef
EFI_STATUS
(EIFIAPI *EFI_SHELL_REMOVE_DUP_IN_FILE_LIST) ( 
    IN EFI_SHELL_FILE_INFO **FileList
);

Parameters
FileList
A pointer to the first entry in the file list.

Description
This function deletes the reduplicate files in the given file list.

Status Codes Returned

| EFI_SUCCESS | Always success. |
EFI_SHELL_PROTOCOL.SetAlias()

Summary
Changes a shell command alias.

Prototype

typedef
    EFI_STATUS
    (EFIAPI *EFI_SHELL_SET_ALIAS)(
    IN CONST CHAR16 *Command,
    IN CONST CHAR16 *Alias,
    IN BOOLEAN Replace
    );

Parameters

    Command
    Points to the null-terminated shell command or existing alias.

    Alias
    Points to the null-terminated alias for the shell command. If this is NULL, and Command
    refers to an alias, that alias will be deleted.

    Replace
    If TRUE and the alias already exists, then the existing alias will be replaced. If FALSE and
    the alias already exists, then the existing alias is unchanged and EFI_ACCESS_DENIED is returned.

Description
This function creates an alias for a shell command.

Return Value

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>Alias created or deleted successfully.</td>
</tr>
<tr>
<td>EFI_ACCESS_DENIED</td>
<td>The alias is a built-in alias or already existed and Replace was set to FALSE.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.SetCurDir()**

**Summary**
Changes the current directory on the specified device.

**Prototype**
```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_SET_CUR_DIR) (  
  IN CONST CHAR16 *FileSystem OPTIONAL,  
  IN CONST CHAR16 *Dir  
);
```

**Parameters**
- **FileSystem**
  A pointer to the file system’s mapped name. If **NULL**, then the current working directory is changed.
- **Dir**
  Points to the null-terminated directory on the device specified by **FileSystem**.

**Description**
If the **FileSystem** is **NULL**, and the directory **Dir** does not contain a file system’s mapped name, this function changes the current working directory. If **FileSystem** is **NULL** and the directory **Dir** contains a mapped name, then the current file system and the current directory on that file system are changed.

If **FileSystem** is not **NULL**, and **Dir** is **NULL**, then this changes the current working file system.

If **FileSystem** is not **NULL** and **Dir** is not **NULL**, then this function changes the current directory on the specified file system.

If the current working directory or the current working file system is changed then the `%cwd%` environment variable will be updated. For more information, see “Current Directory”, section 3.5.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>≠NULL</td>
<td>The current directory.</td>
</tr>
<tr>
<td>NULL</td>
<td>Current directory does not exist.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.SetEnv()**

**Summary**

Sets the environment variable.

**Prototype**

```c
typedef EFI_STATUS (EFI_API *EFI_SHELL_SET_ENV) (
    IN CONST CHAR16 *Name,
    IN CONST CHAR16 *Value,
    IN BOOLEAN Volatile
);
```

**Parameters**

- **Name**
  Points to the null-terminated environment variable name.

- **Value**
  Points to the null-terminated environment variable value. If the value is an empty string then the environment variable is deleted.

- **Volatile**
  Indicates whether the variable is non-volatile (**FALSE**) or volatile (**TRUE**).

**Description**

This function changes the current value of the specified environment variable. If the environment variable exists and the Value is an empty string, then the environment variable is deleted. If the environment variable exists and the Value is not an empty string, then the value of the environment variable is changed. If the environment variable does not exist and the Value is an empty string, there is no action. If the environment variable does not exist and the Value is a non-empty string, then the environment variable is created and assigned the specified value.

For a description of volatile and non-volatile environment variables, see 3.6.1.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_SUCCESS</td>
<td>The environment variable was successfully updated.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.SetFileInfo()**

**Summary**

Sets the file information to an opened file handle.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI *EFI_SHELL_SET_FILE_INFO)(
    IN EFI_FILE_HANDLE FileHandle,
    IN CONST EFI_FILE_INFO *FileInfo
);
```

**Parameters**

- **FileHandle**
  A file handle
- **FileInfo**
  Points to new file information.

**Description**

This function changes file information.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFI_SUCCESS</strong></td>
<td>The information was set.</td>
</tr>
<tr>
<td><strong>EFI_NO_MEDIA</strong></td>
<td>The device has no medium.</td>
</tr>
<tr>
<td><strong>EFI_DEVICE_ERROR</strong></td>
<td>The device reported an error.</td>
</tr>
<tr>
<td><strong>EFI_VOLUME_CORRUPTED</strong></td>
<td>The file system structures are corrupted.</td>
</tr>
<tr>
<td><strong>EFI_WRITE_PROTECTED</strong></td>
<td>The file or medium is write-protected.</td>
</tr>
<tr>
<td><strong>EFI_ACCESS_DENIED</strong></td>
<td>The file was opened read-only.</td>
</tr>
<tr>
<td><strong>EFI_VOLUME_FULL</strong></td>
<td>The volume is full.</td>
</tr>
<tr>
<td><strong>EFI_BAD_BUFFER_SIZE</strong></td>
<td>BufferSize is smaller than the size of EFI_FILE_INFO.</td>
</tr>
</tbody>
</table>

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EFI_SHELL_PROTOCOL.SetFilePosition()

Summary
Sets a file's current position

Prototype

typedef
EFI_STATUS
(EIFIAPI *EFI_SHELL_SET_FILE_POSITION)(
    IN EFI_FILE_HANDLE FileHandle,
    IN UINT64 Position
);

Parameters

FileHandle
The file handle on which requested position will be set.

Position
Byte position from the start of the file

Description

This function sets the current file position for the handle to the position supplied. With the exception of seeking to position 0xFFFFFFFFFFFFFFFF, only absolute positioning is supported, and seeking past the end of the file is allowed (a subsequent write would grow the file). Seeking to position 0xFFFFFFFFFFFFFFFF causes the current position to be set to the end of the file.

Status Codes Returned

<table>
<thead>
<tr>
<th>EFI_SUCCESS</th>
<th>Data was written.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_UNSUPPORTED</td>
<td>The seek request for nonzero is not valid on open directories.</td>
</tr>
</tbody>
</table>
EFI_SHELL_PROTOCOL.SetMap()

Summary
Changes a shell command alias.

Prototype
typedef EFI_STATUS (EFIAPI *EFI_SHELL_SET_MAP)(
    IN CONST EFI_DEVICE_PATH_PROTOCOL *DevicePath,
    IN CONST CHAR16 *Mapping
);

Parameters

DevicePath
Points to the device path. If this is NULL and Mapping points to a valid mapping, then the mapping will be deleted.

Mapping
Points to the null-terminated mapping for the device path.

Description
This function creates a mapping for a device path.

Return Value

<table>
<thead>
<tr>
<th>EFI_SUCCESS</th>
<th>Mapping created or deleted successfully.</th>
</tr>
</thead>
<tbody>
<tr>
<td>EFI_NO_MAPPING</td>
<td>There is no handle that corresponds exactly to DevicePath. See the boot service function LocateDevicePath().</td>
</tr>
<tr>
<td>EFI_ACCESS_DENIED</td>
<td>The mapping is a built-in alias.</td>
</tr>
</tbody>
</table>
**EFI_SHELL_PROTOCOL.WriteFile()**

**Summary**

Writes data to the file.

**Prototype**

```c
typedef EFI_STATUS (EFIAPI EFI_SHELL_WRITE_FILE)(
    IN           EFI_FILE_HANDLE FileHandle,
    IN OUT      UINTN         *BufferSize,
    OUT          VOID          *Buffer
);```

**Parameters**

- **FileHandle**
  - The opened file handle for writing.
- **BufferSize**
  - On input, size of Buffer.
- **Buffer**
  - The buffer in which data to write.

**Description**

This function writes the specified number of bytes to the file at the current file position. The current file position is advanced the actual number of bytes written, which is returned in BufferSize. Partial writes only occur when there has been a data error during the write attempt (such as "volume space full"). The file automatically grows to hold the data, if required.

Direct writes to opened directories are not supported.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EFI_SUCCESS</strong></td>
<td>Data was written.</td>
</tr>
<tr>
<td><strong>EFI_UNSUPPORTED</strong></td>
<td>Writes to open directory are not supported</td>
</tr>
<tr>
<td><strong>EFI_NO_MEDIA</strong></td>
<td>The device has no media</td>
</tr>
<tr>
<td><strong>EFI_DEVICE_ERROR</strong></td>
<td>The device reported an error</td>
</tr>
<tr>
<td><strong>EFI_VOLUME_CORRUPTED</strong></td>
<td>The file system structures are corrupted</td>
</tr>
<tr>
<td><strong>EFI_WRITE_PROTECTED</strong></td>
<td>The device is write-protected</td>
</tr>
<tr>
<td><strong>EFI_ACCESS_DENIED</strong></td>
<td>The file was open for read only</td>
</tr>
<tr>
<td><strong>EFI_VOLUME_FULL</strong></td>
<td>The volume is full</td>
</tr>
</tbody>
</table>

*Version 2.0*
2.3 EFI_SHELL_PARAMETERS_PROTOCOL

EFI_SHELL_PARAMETERS_PROTOCOL

Summary

Shell application’s arguments.

GUID

```c
#define EFI_SHELL_PARAMETERS_PROTOCOL_GUID
  { 0x752f3136, 0x4e16, 0x4fdc, 
  { 0xa2, 0x2a, 0xe5, 0xf4, 0x68, 0x12, 0xf4, 0xca } };```

Prototype

```c
typedef struct _EFI_SHELL_PARAMETERS_PROTOCOL {
  CHAR16 **Argv;
  UINTN Argc;
  EFI_FILE_HANDLE StdIn;
  EFI_FILE_HANDLE StdOut;
  EFI_FILE_HANDLE StdErr;
} EFI_SHELL_PARAMETERS_PROTOCOL;
```

Parameters

Argv

Points to an Argc-element array of points to null-terminated strings containing
the command-line parameters. The first entry in the array is always the full file
path of the executable. Any quotation marks that were used to preserve
whitespace have been removed.

Argc

The number of elements in the Argv array.

StdIn

The file handle for the standard input for this executable. This may be different
from the ConInHandle in the EFI_SYSTEM_TABLE.

StdOut

The file handle for the standard output for this executable. This may be different
from the ConOutHandle in the EFI_SYSTEM_TABLE.

StdErr

The file handle for the standard error output for this executable. This may be
different from the StdErrHandle in the EFI_SYSTEM_TABLE.

Description

An instance of this protocol is installed on each shell application’s image handle prior
to calling StartImage(). It describes all of the command-line parameters passed on
the command line, as well as the standard file handles for standard input, output and
error output.
3 UEFI Shell Features

The UEFI Shell supports an interactive command-line interface, scripting, and a standard set of commands.

All the commands can be invoked by entering the name of the command at the command prompt. For external commands, they must reside in a file system. So, to run them users need to have at least one mapped file system and put those external commands under this file system.

The active drive may be changed by entering the mapped name followed by a `:` at the command prompt.

3.1 Levels Of Support

This section describes the different standard levels of shell support. The different standard levels are designed to provide different feature/size tradeoffs for different uses. The levels mentioned here are referenced throughout this specification.

<table>
<thead>
<tr>
<th>Level</th>
<th>Name</th>
<th>Execute()/ Scripting/ startup.nsh</th>
<th>PATH?</th>
<th>ALIAS?</th>
<th>Interactive?</th>
<th>Commands</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Minimal</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>None</td>
</tr>
<tr>
<td>1</td>
<td>Scripting</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>for, endfor, goto, if, else, endif, shift, exit</td>
</tr>
<tr>
<td>2</td>
<td>Basic</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>attrib, cd, cp, date*, time*, del, load, ls, map, mkdir, mv, rm, reset, set, timezone*</td>
</tr>
<tr>
<td>3</td>
<td>Interactive</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>alias, date, echo, help, pause, time, touch, type, ver, cls, timezone</td>
</tr>
</tbody>
</table>

*Non-interactive forms only

Execute()/Scripting/startup.nsh support indicates whether the Execute() function is supported by the EFI_SHELL_PROTOCOL, whether or not scripts are supported and whether the default startup script startup.nsh is supported.
**PATH** support determines whether the PATH environment variable will be used to determine the location of executables.

**ALIAS** support determines whether the ALIAS environment variable will be used to determine alternate names for shell commands.

**Interactive** determines whether or not an interactive session can be started.

For more information on scripting, see UEFI Shell Script (Chapter 4).

For more information on processing of the startup.nsh file, please see UEFI Shell Initialization (section 3.3).

The shell must remain compliant with its advertised **shellsupport** command profile. There can be cases where a shell implementation may not want to expose certain commands to all users. If a shell implementation wants to make a particular command inaccessible to a particular user, they must properly interpret the command request and return an appropriate return code, such as SHELL_SECURITY_VIOLATION.

### 3.2 Invocation

The UEFI Shell is a UEFI application. The UEFI Shell takes command-line options that are null-terminated UCS-2 encoded strings. The syntax is:

```
shell.efi [ShellOpt-options] [options] [file-name [file-name-options]]
```

The command-line options are separated by the space or tab character. The options are processed left-to-right retrieved from the **LoadOptions** field of the **EFI_LOADED_IMAGE_PROTOCOL**.

The following table describes the standard command-line options.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>file-name</code></td>
<td>The name of a UEFI shell application or script to be executed after initialization is complete. By default, if <code>file-name</code> is specified, then <code>-nostartup</code> is implied. Scripts are not supported by level 0.</td>
</tr>
<tr>
<td><code>file-name-options</code></td>
<td>The command-line options that are passed to <code>file-name</code> when it is invoked.</td>
</tr>
<tr>
<td><code>options</code></td>
<td>Options (from table X below) which control the initialization behavior of the shell.</td>
</tr>
<tr>
<td><code>ShellOpt-options</code></td>
<td>Options (from table X below) which control the initialization behavior of the shell. These options are read from the EFI global variable &quot;ShellOpt&quot; and are processed before options or <code>file-name</code>.</td>
</tr>
</tbody>
</table>

**Table 3: UEFI Shell Invocation Options**

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-nostartup</code></td>
<td>The default startup script <code>startup.nsh</code> will not be executed.</td>
</tr>
<tr>
<td><code>-noconsoleout</code></td>
<td>Console output from the shell applications will not be displayed. This has no effect for UEFI Shells that do not support an interactive mode.</td>
</tr>
</tbody>
</table>
-noconsolein

Console input will not be accepted from the user. This has no effect for UEFI Shells that do not support an interactive mode.

-delay[:n]

Specifies the integer number of seconds the shell will delay prior to the execution of startup.nsh. Ignored for shell level 0 or if --nostartup is specified. If n is not specified, the default is 5 seconds. If 0 is specified, then there will be no delay. If --nointerrupt is specified, then there will be no delay.

-nointerrupt

Execution interruption (as described in Execution Interrupt Support) is not allowed. This has no effect for UEFI Shells that do not support an interactive mode.

-nomap

The default mappings will not be displayed.

-noversion

The version information will not be displayed.

-startup

The default startup script startup.nsh will be executed. Requires shell support level 1 or higher. This overrides the default behavior when filename is specified.

3.3 Initialization

This section describes the steps taken during shell initialization. The following steps are not exhaustive, but they are executed in order:

1. The command-line options of the shell itself are processed.

2. Default file system (FSx:) mapped names are created. The current directory for each mapped name is set to the root.

3. The default alias settings are read from non-volatile storage. This is only supported in shell level 2.

4. The default environment variable settings are read from non-volatile storage.

5. The profiles are read into the ‘profiles’ environment variable.

6. If the shell supports interactive mode and console output support is enabled, then the console is cleared.

7. The platform watchdog will be cleared through the UEFI SetWatchdogTimer() API to avoid inadvertent platform resets during long operations within the UEFI Shell environment.

8. If the shell supports interactive mode and console output support is enabled and version support (see --noversion) is enabled, then the equivalent of ver will be executed.

9. If the shell supports interactive mode and console output support is enabled and map support is enabled (see --nomap), then the equivalent of map --terse will be executed.

10. If interactive mode is supported and execution interrupt is supported (see --nointerrupt) then the shell will wait for the number of seconds specified by the --delay option.
11. If startup.nsh is supported and enabled (see \texttt{-startup} and \texttt{-nostartup}), the script will be launched.

12. If a file name was specified among the command-line options, then the image or script (if supported) is launched.

### 3.3.1 Finding \texttt{startup.nsh}

When executing \texttt{startup.nsh}, the shell will search for it first in the directory where the shell itself was launched. If it cannot find the \texttt{startup.nsh} file in that directory or it was not launched from a file system, it will search the execution path defined by the environment variable \texttt{PATH}.

### 3.3.2 Supported Profiles

The UEFI Shell may have support for zero or more profiles, such as those described in chapter 5 built in to its executable. Additional profiles are described in the file ‘profiles.txt’, located in the same directory as the UEFI Shell executable. The contents of the file are carriage-return delimited (one profile name per line) and are read into the UEFI shell environment variable ‘profiles’, where they are semicolon (‘;’) delimited. Profiles names that begin with ‘UEFI’ are reserved for use in this specification.

### 3.4 Command-Line

The UEFI Shell implements a programming language that provides control over the execution of individual commands. Command names and keywords in certain commands are all case insensitive.

The UEFI Shell processes the command-line by

1. Substituting aliases. The UEFI Shell supports specifying aliases for UEFI Shell commands (both internal and external). The substitution is performed automatically on the first command-line parameter.

2. Substituting variables. The UEFI Shell finds the % character and substitutes the value of an Environment Variable, Positional Parameter or Index Parameter based on the characters found after the % character. See Variables (section, 3.6) for more information.

3. Setting up input and output redirection. Using special characters on the command-line, the UEFI Shell can get input from a file and send output to a file. See Redirection (section 3.4.4) for more information.

4. Breaking up the command-line into arguments. The arguments are delimited by non-quoted whitespace characters.

5. Launching the shell command or UEFI Shell script.
3.4.1 Special Characters

When the shell scans its input, it always treats certain characters (#, >, <, |, %, *, ?, ^, ", space, [, ] and newline) specially. The usage of these characters is briefly listed here:

<table>
<thead>
<tr>
<th>Character</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>newline</td>
<td>Ends a command line.</td>
</tr>
<tr>
<td>space</td>
<td>Ends an argument, if it is not in a quotation.</td>
</tr>
<tr>
<td>#</td>
<td>Starts a comment.</td>
</tr>
<tr>
<td>&gt;</td>
<td>Used for output redirection.</td>
</tr>
<tr>
<td>&lt;</td>
<td>Used for input redirection</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>Used to delimit a variable or an argument.</td>
</tr>
<tr>
<td>*</td>
<td>Used to delimit a quotation.</td>
</tr>
<tr>
<td>^</td>
<td>Prevents the next character from being interpreted as having special meaning. Can be used inside quoted strings.</td>
</tr>
<tr>
<td>*, ?, [, ]</td>
<td>Wildcards to specify multiple similar file names.</td>
</tr>
</tbody>
</table>

3.4.2 Escape Characters

The escaping character ^ is used to prevent interpreting the character that immediately follows it as a special character.

3.4.3 Quoting

The UEFI Shell uses quotation marks for argument grouping. Normally, the UEFI Shell will interpret a one or more whitespace character as an argument delimiter. However, if the whitespace character appears between double quotation marks, it will be ignored for the purposes of argument delimiting. Empty strings are treated as valid command line arguments. Substitution of environment variables and positional parameters still occurs within quotation marks.

Double-quotation marks that surround arguments are stripped before they are passed to the entry point of a shell application. For more information, see the Argv member of the EFI_SHELL_PARAMETERS_PROTOCOL.

Double-quotation marks that surround arguments are not stripped in positional parameters (see Positional Parameters, section 3.6.2) or on the copy of the command line passed in the loadOptions member of the EFI_LOADED_IMAGE_PROTOCOL passed to shell applications.

To include a double-quotation mark inside of a quoted string, use ^". To include a ^ character inside of a quoted string, use ^^^.
3.4.4 Redirection

3.4.4.1 Output Redirection

Output of EFI Shell commands can be redirected to files. For example:

```
Command > ucs2_output_file_pathname
Command >a ascii_output_file_pathname
Command 1> ucs-2 output file_pathname
Command 1>a ascii_output_file_pathname
Command 2> ucs-2 output file_pathname
Command 2>a ascii output file_pathname
Command >> ucs-2 output file_pathname
Command >>a ascii output file_pathname
Command 1>> ucs-2 output file_pathname
Command 1>>a ascii output file_pathname
```

Table 4 shows the special character combinations that are used to denote output redirection operations:

<table>
<thead>
<tr>
<th>Character Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt;</td>
<td>Redirect standard output to a UCS-2 encode file.</td>
</tr>
<tr>
<td>&gt;a</td>
<td>Redirect standard output to an ASCII file.</td>
</tr>
<tr>
<td>1&gt;</td>
<td>Redirect standard output to a UCS-2 encoded file.</td>
</tr>
<tr>
<td>1&gt;a</td>
<td>Redirect standard output to an ASCII file.</td>
</tr>
<tr>
<td>2&gt;</td>
<td>Redirect standard output to an environment variable, encoded as UCS-2.</td>
</tr>
<tr>
<td>2&gt;a</td>
<td>Redirect standard output to an ASCII file.</td>
</tr>
<tr>
<td>&gt;v</td>
<td>Redirect standard output appended to a UCS-2 encoded file.</td>
</tr>
<tr>
<td>1&gt;v</td>
<td>Redirect standard output appended to an ASCII file.</td>
</tr>
<tr>
<td>2&gt;v</td>
<td>Redirect standard output appended to a UCS-2 encoded file.</td>
</tr>
<tr>
<td>&gt;&gt;</td>
<td>Redirect standard output appended to a UCS-2 encoded file.</td>
</tr>
<tr>
<td>&gt;&gt;a</td>
<td>Redirect standard output appended to an ASCII file.</td>
</tr>
<tr>
<td>1&gt;&gt;</td>
<td>Redirect standard output appended to a UCS-2 encoded file.</td>
</tr>
<tr>
<td>1&gt;&gt;a</td>
<td>Redirect standard output appended to an ASCII file.</td>
</tr>
<tr>
<td>&gt;&gt;v</td>
<td>Append standard output to an environment variable, encoded as UCS2.</td>
</tr>
<tr>
<td>1&gt;&gt;v</td>
<td>Append standard output to an environment variable, encoded as UCS2.</td>
</tr>
</tbody>
</table>
The UEFI Shell will redirect standard output to a single file or variable and standard error to a single file or variable. Redirecting both standard output and standard error to different files or variables is allowed, but not to the same file or variable. Redirecting standard output to more than one file or variable on the same command is not supported. Similarly, redirecting to multiple files or variables is not supported for standard error either.

When redirecting output to an environment variable, if a new environment variable will be created, then it will be volatile. If the environment variable already exists and is non-volatile, an error will be generated.

All output to UCS-2 encoded files will be prefixed with the Unicode Byte Ordering Character (0xFFFE) if (a) there is at least one other character output and (b) that character is not the Unicode Byte Ordering Character.

“NUL” is used as a special output file name. When “NUL” is used, the output will not be written into a file. Instead, they are discarded silently.

### 3.4.4.2 Input Redirection

Contents from an existing file or variable can be used as standard input to a UEFI shell command. Any commands coming from an ASCII file will be automatically be converted to the equivalent UCS-2 encoding and passed to the UEFI shell command.

When redirecting input from an environment variable, the environment variable must already exist. If it does not, an error will be generated. The shell will ensure that the first character read from an input redirected environment variable will contain the Unicode Byte Ordering Character (0xFFFE). If the first character in the input source is not the Unicode Byte Ordering Character, the shell will insert this character in the output from the input redirected variable. This is done to ensure that an input redirected variable will look like a UCS-2 encoded file.

Redirecting input from a non-volatile variable is permitted.

#### Table 5 Input Redirection Syntax

<table>
<thead>
<tr>
<th>Character Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>&lt;</code></td>
<td>Redirect standard input from a Unicode file.</td>
</tr>
<tr>
<td><code>&lt;a</code></td>
<td>Redirect standard input from an ASCII file.</td>
</tr>
<tr>
<td><code>&lt;v</code></td>
<td>Redirect standard input from an environment variable.</td>
</tr>
</tbody>
</table>

### 3.4.4.3 Pipe Support

By using the `|` character, a data channel is formed that takes the standard Unicode output of a file and feeds the data as standard input to another program.

The format for this support is as follows:
When piping from an environment variable, the environment variable must already exist. If it does not, an error will be generated. Any Unicode Byte Ordering Characters are ignored.

Table 6 Input Redirection Syntax

<table>
<thead>
<tr>
<th>Character Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>a</td>
</tr>
</tbody>
</table>

When piping to an environment variable, if a new environment variable will be created, then it will be volatile. If the environment variable already exists and is non-volatile, an error will be generated.

All output to UCS-2 encoded files will be prefixed with the Unicode Byte Ordering Character (0xFFFE) if (a) there is at least one other character output and (b) that character is not the Unicode Byte Ordering Character.

3.5 Current Directory

For each file system, the UEFI Shell maintains a current directory, which is the default directory used if a directory is not specified in a file path. The UEFI Shell maintains a current working file system, which is the default file system used if one is not supplied in a file path. The current directory in the current working file system is the current working directory.

The current directory for any file system and current working file system can be retrieved using the GetCurDir() function (see page 34). The current directory for any file system and the current working file system can be changed using the SetCurDir() function (see page 57).

The current directory for any file system and current working directory can retrieved and changed using the cd shell command (see page 95).

The current working directory can be found in the standard %cwd% environment variable.

3.6 Variables

This section describes the different types of variable substitution that happens on the command-line for environment variables, positional parameters, index parameters and aliases.
3.6.1 Environment Variables

Environment variables are variables that can hold the user specified contents and can be used on the command line or in scripts. Each environment variable has a case-sensitive name (a C-style identifier) and a string value. Environment variables can be either volatile (they will lose their value on reset or power-off) or non-volatile (they will maintain their value across reset or power-off).

Environment variables can be used on the command-line by using `%%variable-name%%` where `variable-name` is the environment variable's name. Variable substitution is not recursive. Environment variables can also be retrieved by a UEFI Shell command by using the `GetEnv()` function.

Environment variables can be displayed or changed using the `set` shell command. They can also be changed by a UEFI Shell command using the `SetEnv()` function.

The following table lists the environment variables that have special meaning to the UEFI Shell:

![Variable substitution flow chart](image-url)
<table>
<thead>
<tr>
<th>Variable</th>
<th>V/NV</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>cwd</td>
<td>V/RO</td>
<td>The current working directory, including the current working file system. See “Current Directory” (page TBD) for more information.</td>
</tr>
<tr>
<td>Lasterror</td>
<td>V/RO</td>
<td>Last returned error from a UEFI Shell command or batch script</td>
</tr>
</tbody>
</table>
| path           | V/RW | The UEFI Shell has a default volatile environment variable path, which contains the default path that UEFI Shell will search if necessary. When user wants to launch an UEFI application, UEFI Shell will first try to search the current directory if it exists, and then search the path list sequentially. If the application is found in one of the paths, it will stop searching and execute that application. If the application is not found in all the paths, UEFI Shell will report the application is not found. If the path variable is empty or it doesn’t exist, UEFI Shell will treat current directory as the working directory. In general, paths stored in path variable looks like: 

```
path:
.;fs0:\efi\tools;fs0:\efi\boot;fs0:\efi\tools;fs1:\efi\boot;fs1:"
```

The UEFI Shell supports both absolute paths and relative paths when launching commands. Users can set path to any specified value, but this variable will be refreshed immediately after the execution of command `map -r` and it’s volatile so that the contents will be lost after reset or power off. Typically users can append the paths to this variable in this way:

```
set -v path %path%;fs0:\test
```

| profiles       | NV/RO | The list of UEFI shell command profiles supported by the shell. Each profile name may only contain alphanumeric characters or the `_' character. Profile names are semicolon (`;`) delimited. |
| shellsupport    | V/RO  | Reflects the current support level enabled by the currently running shell environment (see UEFI Shell Levels of Support, section 3.1). The contents of the variable will reflect the text-based numeric version in the form that looks like: 

```
3
```

This variable is produced by the shell itself and is intended as read-only, any attempt to modify the contents will be ignored. |
| uefishellversion| V/RO  | Reflects the revision of the UEFI Shell specification that the shell supports. The contents are formatted as text: 

```
2.00
```

|   |   |   | |
3.6.2 Positional Parameters

Positional parameters are the first ten arguments (%0-%9) passed from the command line into a UEFI shell script. The first parameter after the UEFI Shell script name becomes %1, the second %2, the third %3, and so on. %0 is the full path name of the script itself.

The `shift` (see page 162) command can be used delete the contents of %1 and shift all of the other positional parameters down one place (%2 -> %1, %3 -> %2, %4 -> %3, etc.) There is no way for a UEFI Shell script to access the 10th or greater argument without using `shift`.

When executing the UEFI Shell script, the %n is replaced by the corresponding argument on the command-line that invoked the script. If a positional parameter is referenced in the UEFI Shell script but that parameter was not present, then an empty string is substituted.

Positional parameters do not have quotation marks removed from them. For more information on how quotation marks are handled, see “Quoting”

3.6.3 Index Parameters

Index parameters are the variables created by the `for` command (see page 139) when executing inside of a UEFI Shell script. Each index parameter is in the form of %x, where x is a case-insensitive letter (%a-%z).

When executing the UEFI Shell script, the %x is replaced by the value specified by the `for` command. If the specified index parameter has not been defined in the current UEFI Shell script, the script execution will halt with an error.

3.6.4 Aliases

An alias creates an additional name for an internal UEFI Shell command or a UEFI Shell application. Aliases can be used to provide alternative commonly used names for existing shell commands or even create shortcuts. An alias is a C-style identifier and may refer to an internal command or else the directory and file name of a UEFI shell application.

During command-line processing, if the 1st argument of a command is a defined alias, the shell replaces the alias with its defined value. The alias substitution occurs after

<table>
<thead>
<tr>
<th>uefiversion</th>
<th>V/RO</th>
<th>Reflects the revision of the UEFI specification that the underlying firmware supports. The contents will look like this:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.10</td>
<td></td>
</tr>
</tbody>
</table>

Version 2.0
the variable substitution. So if \texttt{\textasciitilde myvariable\textasciitilde} is set to \texttt{dir} and \texttt{dir} is aliased to \texttt{ls}, entering \texttt{\textasciitilde myvariable\textasciitilde} in command line will cause the \texttt{ls} command to be executed. Alias substitution is not recursive.

There are several built-in aliases (sometimes referred to as synonyms) provided by the UEFI Shell for the following commands:

<table>
<thead>
<tr>
<th>Original Command</th>
<th>Built-In Alias</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>\texttt{ls}</td>
<td>\texttt{dir}</td>
<td>List directory contents</td>
</tr>
<tr>
<td>\texttt{rm}</td>
<td>\texttt{del}</td>
<td>Delete a file</td>
</tr>
<tr>
<td>\texttt{cp}</td>
<td>\texttt{copy}</td>
<td>Copy a file</td>
</tr>
<tr>
<td>\texttt{mkdir}</td>
<td>\texttt{md}</td>
<td>Create a directory</td>
</tr>
<tr>
<td>\texttt{dmem}</td>
<td>\texttt{mem}</td>
<td>Display memory</td>
</tr>
</tbody>
</table>

3.7 **File Names**

The UEFI Shell supports file names and paths with the following format:

\[
\begin{align*}
\textit{fs-path} & := [\textit{fs-map-name}] [\textit{fs-divider}] [\textit{fs-dirs}] [\textit{fs-name}] \\
\textit{fs-map-name} & := \text{identifier} : \\
\textit{fs-divider} & := \backslash / : \\
\textit{fs-dirs} & := \textit{fs-dir} | \\
\textit{fs-dir} & := \textit{fs-name} \textit{fs-divider} \\
\textit{fs-name} & := \textit{fs-file-name} . \textit{fs-file-ext} \\
\textit{fs-file-name} & := \text{one or more ASCII characters, excluding } \ast ? <> \backslash / \\
\end{align*}
\]

Both short and long names are supported. The maximum valid length for a file path is 255 characters.

3.7.1 **Wildcard Expansion**

The \ast, ? and [] characters can be used as wildcard characters in file name command-line options certain UEFI shell commands that use the \texttt{OpenFileList()} function. In addition, the UEFI Shell \texttt{for} and \texttt{if} script commands also expand arguments containing wildcard characters to existing file names that matches the pattern. A \textasciitilde before the wildcard cannot prevent the wildcard from being expanded.
[] can be either wildcard characters or literal file name characters, the UEFI Shell will try to take them as wildcard characters first to match files, if there are files matched, no further interpretation. Otherwise, they will be considered as literal characters in file names.

<table>
<thead>
<tr>
<th>Character Sequence</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>*</td>
<td>Matches zero or more characters in a file name.</td>
</tr>
<tr>
<td>?</td>
<td>Matches exactly one character in a file name.</td>
</tr>
<tr>
<td>[]</td>
<td>Matches one character in a file name with one of the characters in []</td>
</tr>
</tbody>
</table>

### 3.7.2 Mappings

Mappings are C-style identifiers that act as an alias for a device path. These mappings can be used interchangeably with the device path in the EFI_SHELL_PROTOCOL and on the interactive shell’s command line. Default mappings (such as fsx) are created by the UEFI Shell during initialization (see Initialization, section 3.3. Other mappings can be created using the map shell command or the SetMap() function.

A mapping which translates to a device path of a device that has a file system protocol installed on its handle is called a file system mapping.

### 3.7.3 Consistent File System Mapping

The UEFI Shell provides consistent mapping for file system mappings. The consistent mappings will not change after reboot or after ‘map –r’ if the hardware configuration hasn’t changed. If two or more computers have the same hardware configurations, the consistent mapping results on these computers should be exactly the same. Hardware configuration changes are defined as the changes of controllers or physical interfaces to which the devices are connected. If you are used to the fsx notation style for mapping file systems, then the new consistent mapping convention might look a little different. For example, the GUIDed file system may have a consistent mapping, such as f0agonennapphibbdlnmeaakamjeafdnb. The fsx style mappings facilitates the use of mappings on the command line, but they don’t have the consistent mapping characteristics.

Consistent mapping only applies to file system mappings, not other device mappings.

### 3.8 Scripts

The UEFI Shell has the capability of executing commands from a file (script). UEFI Shell script files are named using the ".nsh" extension. Script files can be either UCS-2 or ASCII format files. UEFI Shell script files are invoked by entering the filename at the command prompt, with or without the filename extension. See "Scripts" (section 4) for more information.
3.9 Nesting the Shell

The UEFI Shell supports nested shell execution. The UEFI Shell can run the shell from within itself. The maximum nesting level is determined by how much memory the system has. The command `exit` can be used to exit the current shell instance. If the current shell is a child shell, it will return to the parent shell. Newly launched shell will have a brand new execution environment except for environment variables and aliases.

3.10 Interactive Features

Even though the shell design specification primarily discusses aspects of the shell that can run without user interaction, there are some features described which can augment the experience of users that are actively interacting with the console.

3.10.1 Key History Support

The UEFI Shell will save commands history that executed from the shell prompt. User can press up-arrow key and down-arrow key to browse the previous commands. Commands that were executed in script will not be saved in the key history.

3.10.2 Execution Interrupt Support

The UEFI Shell supports the capability of interrupting the execution of the shell commands and scripts.

There are two kinds of the execution interrupt: script execution interrupt and internal command execution interrupt.

**Script Execution Interrupt.**

The user can press CTRL-C to interrupt the execution of the script. The interrupt can only happen between commands in a script. The script supports the nesting of scripts. Once a script is interrupted, all its predecessor scripts are also interrupted.

**Shell Command Execution Interrupt.**

The user can press the CTRL-C key sequence to interrupt the execution of some time-consuming UEFI Shell commands (i.e. `ls -r`). The UEFI Shell detects this key sequence and signals the `ExecutionBreak` member of the `EFI_SHELL_PROTOCOL`. Individual UEFI Shell commands check the state of `ExecutionBreak` as often as practical and return the `SHELL_ABORTED` error code.

The UEFI Shell may not support asynchronous execution interrupt for commands or applications.
3.10.3 **Output Streaming Control**

The UEFI Shell supports the ability to pause and resume the streaming of characters to the output device. The user can press the CTRL-S key sequence to pause and any key to resume the output results produced by the current running commands or applications. It is especially useful for the commands and applications that may produce a great deal of the output results.

3.10.4 **Scroll Back Buffer Support**

The UEFI Shell supports the ability to scroll back and forward the output so that consoles can have screen history. The user can press Page Up and Page Down to scroll back and forward the screen history, and press any other key to quit scrolling. However, the user cannot do this while the command, application or script is being executed. The text output history will be at least 3 screens.

3.11 **Shell Applications**

UEFI Shell applications have the extension .efi and have the same entry point (EFI_IMAGE_ENTRY_POINT) defined in section 4.1 of the UEFI specification. When the entry point to a shell command is called, the image handle (ImageHandle) has both the EFI_LOADED_IMAGE_PROTOCOL and the EFI_SHELL_PARAMETERS_PROTOCOL installed on it.

In the EFI_LOADED_IMAGE_PROTOCOL, the LoadOptions member points to the NULL-terminated, expanded command line. The first part (which corresponds to Argv[0] in the EFI_SHELL_PARAMETERS_PROTOCOL) is the file path of the executable after alias substitution.

After this, delimited by a whitespace character, are listed each of the arguments, with all environment variables expanded, and with quotation marks still present. This is different from what appears in Argv[] in the EFI_SHELL_PARAMETERS_PROTOCOL.

The EFI_SHELL_PARAMETERS_PROTOCOL has two members: Argv[], which points to each of the command-line arguments and argc, which is the number of command-line arguments. There is always at least one command-line argument: the path and file name of the shell command. Any arguments are enumerated in Argv[1-n], with all environment variables expanded and all quotation marks removed.

If ExecutionBreak was signaled during the execution of a UEFI Shell application, then it will be cleared upon return to the shell.

3.11.1 **Installation**

During installation, UEFI Shell applications may choose to update certain global files or settings, which are used for detecting installed UEFI Shell profiles or providing help text for UEFI shell applications.

During installation, UEFI Shell applications may update the profiles environment variable, which lists all of the command profiles supported by the current
implementation of the shell. Some of these command profiles are standard (see “Shell Command Profiles”, section 5.2) and others can be defined by implementers.

During installation, UEFI Shell applications may provide a help file (as described in "Command-Line Help”, section 3.11.2) to support the standard **help** command.

During installation, UEFI Shell applications may update a help file for the help category/categories to which the application belongs. This consists of creating a NAME section for the `<category>.man` file and then copying the NAME section from the command’s help file to the end of the DESCRIPTION section of the `<command>.man` file, if not already present.

The shell application’s category (or categories) is listed in the CATEGORY section of the shell application’s help (.man) file. Help categories are not described as part of this specification.

### 3.11.2 Command-Line Help

The user can get UEFI Shell application command-line either using the **help** command or else by typing in `<command-name> -?`. Both of these use the GetHelpText() (page 32) function to retrieve the help text.

The UEFI Shell gets help text for UEFI Shell applications by search the directory where `startup.nsh` was located (highest priority) (if **-nostartup** was not specified) and then the directories specified by the **path** environment variable for a file with the same name as the UEFI Shell application, but with the **.man** extension. The format of these files is described in Appendix B.

The UEFI Shell supports help categories, which have **.man** pages similar to those for UEFI shell applications, except using the category name instead of the application name.
4 Scripts

UEFI Shell scripts allow user to simplify routine or repetitive tasks. A shell script program is a UCS-2 or ASCII text file that contains one or more commands and has a .nsh file name extension. When the file name is typed at the command prompt, commands in the file are executed sequentially.

All shell commands can be executed in scripts. In addition, some script-only commands are also provided to do basic flow control. Script-only means those commands can be only executed in UEFI Shell Script files, and cannot be executed from the shell prompt.

Up to ten positional arguments are supported for scripts. Positional argument substitution is performed before the execution of each line in the script file. Positional arguments are denoted by %n, where n is a digit between 0 and 9. By convention, %0 is the name of the script file currently being executed.

Script file execution can be nested; that is, script files may be executed from within other script files. Recursion is allowed. Shell scripts run in their parent’s environment.

Output and input redirection are fully supported in scripts. Output redirection on a command in a script file causes the output for that command to be redirected. Output redirection on the invocation of a script causes the output for all commands executed from that script to be redirected to the file, with the output of each command appended to the end of the file.

By default, both the input and output for all commands executed from a script are echoed to the console. Display of commands read from a script file can be suppressed via the echo –ooff command (see echo). Also, additional ‘@’ before a command in a script file can prevent the current command from being echoed.

If output for a command is redirected to a file, then that output is not displayed on the console. Commands executed from a script will not be saved by the shell for key history and these commands cannot be recalled by pressing Up-Arrow key.

4.1 Comments

Comments can be embedded in scripts. The # character on a line is used to denote that all characters on the same line and to the right of the # are to be ignored by the shell. Whether the echo state is on or off, comments are not echoed to the console.

4.2 Error Handling

By default, if an error is encountered during the execution of a command in a script, the script will continue to execute. But if an error is encountered when executing the script-only commands which affects the logic of the script, such as for, endfor, if,
else, endif, and goto, the script will exit. If the error arousing script is a called by another script, the caller script will continue to execute.

The lasterror shell variable allows scripts to test the results of the most recently executed command using the if command. This variable is maintained by the shell, is read-only, and cannot be modified by command set.

Script-only commands, as well as echo, which are used to control the logic of the script, do not affect the value of variable lasterror. The lasterror environment variable is not changed by comments.

4.3 Script Nesting

Scripts can be nested. A script can call one or more scripts. The embedded script will be executed as a command. After the whole embedded script is executed completely, the next command will be executed.

The UEFI Shell will automatically save and restore the running mode before and after the execution of nested scripts so that the changes of running modes in nested scripts will not affect the running mode of a parent script.

4.4 Output and Echoing

Output redirection is supported for scripts. Output redirection on a command in a script file causes the output for that command to be redirected. Output redirection on the invocation of a script causes the output for all commands executed from that script to be redirected to the file, with the output of each command appended to the end of the file. If a command in a script redirects its output to file1, while the output is redirected to file2 on invocation of a whole script, the output of that command will appear in file2, as well as output of all other commands.

When a script is launched from the interactive shell, it inherits its echo state from interactive shell or parent script. Changing echo state in the script does not affect the echo state of the interactive shell. When a script calls another script, the called script inherits the caller script’s current echo state. But if the called script changes the echo state, after returning, the caller’s echo script changes, too.

4.5 Limitations

Following are some examples of known limitations with the UEFI scripts:

1. Cannot read and write the same file within a single command, for example,
   ```bash
   fs0:>type test.nsh > test.nsh
   ```

2. goto cannot be used to jump into another loop.

3. Don’t use the same index variable in nested for statements.

4. Index values cannot be referred outside of the for statement that defines it.
5 Shell Commands

5.1 Overview

This section describes the standard UEFI Shell commands.

The table below lists all standard UEFI Shell commands.
## Table 10 Commands from Default Build Shell

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
<th>Required at Shell Level or Profile</th>
</tr>
</thead>
<tbody>
<tr>
<td>alias</td>
<td>Displays, creates, or deletes aliases in the UEFI Shell environment</td>
<td>3</td>
</tr>
<tr>
<td>attrib</td>
<td>Displays or changes the attributes of files or directories.</td>
<td>2</td>
</tr>
<tr>
<td>bcfg</td>
<td>Manipulate boot order and driver order</td>
<td>Debug1, Install1</td>
</tr>
<tr>
<td>cd</td>
<td>Displays or changes the current directory</td>
<td>2</td>
</tr>
<tr>
<td>cls</td>
<td>Clears the standard output and optionally changes the background color</td>
<td>3</td>
</tr>
<tr>
<td>comp</td>
<td>Compares the contents of two files on a byte for byte basis</td>
<td>Debug1</td>
</tr>
<tr>
<td>connect</td>
<td>Binds a driver to a specific device and starts the driver.</td>
<td>Driver1</td>
</tr>
<tr>
<td>cp</td>
<td>Copies one or more source files or directories to a destination.</td>
<td>2</td>
</tr>
<tr>
<td>date</td>
<td>Displays and sets the current date for the system.</td>
<td>2/3</td>
</tr>
<tr>
<td>dblk</td>
<td>Displays the contents of one or more blocks from a block device.</td>
<td>Debug1</td>
</tr>
<tr>
<td>del</td>
<td>Deletes one or more files or directories.</td>
<td>2</td>
</tr>
<tr>
<td>devices</td>
<td>Displays the list of devices managed by UEFI drivers.</td>
<td>Driver1</td>
</tr>
<tr>
<td>devtree</td>
<td>Displays the tree of devices compliant with the UEFI Driver Model.</td>
<td>Driver1</td>
</tr>
<tr>
<td>dh</td>
<td>Displays the device handles in the UEFI environment.</td>
<td>Driver1</td>
</tr>
<tr>
<td>dir</td>
<td>Lists directory contents or file information.</td>
<td>2</td>
</tr>
<tr>
<td>disconnect</td>
<td>Disconnects one or more drivers from the specified devices.</td>
<td>Driver1</td>
</tr>
<tr>
<td>dmem</td>
<td>Displays the contents of system or device memory.</td>
<td>Debug1</td>
</tr>
<tr>
<td>dmpstore</td>
<td>Manages all UEFI NVRAM variables.</td>
<td>Debug1</td>
</tr>
<tr>
<td>drivers</td>
<td>Displays a list of information for drivers that follow the EFI Driver Model in the EFI environment.</td>
<td>Driver1</td>
</tr>
<tr>
<td>drvcfg</td>
<td>Configures the driver using the UEFI Configuration Access Protocol.</td>
<td>Driver1</td>
</tr>
<tr>
<td>drvdiag</td>
<td>Invokes the Driver Diagnostics Protocol.</td>
<td>Driver1</td>
</tr>
<tr>
<td>echo</td>
<td>Controls whether or not script commands are displayed as they are read from the script file and prints the given message to the display.</td>
<td>3</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
<td>Required at Shell Level or Profile</td>
</tr>
<tr>
<td>------------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>alias</td>
<td>Displays, creates, or deletes aliases in the UEFI Shell environment</td>
<td>3</td>
</tr>
<tr>
<td>attrib</td>
<td>Displays or changes the attributes of files or directories.</td>
<td>2</td>
</tr>
<tr>
<td>edit</td>
<td>Full screen editor for ASCII or UCS-2 files.</td>
<td>Debug1</td>
</tr>
<tr>
<td>eficompress</td>
<td>Compress a file using EFI Compression Algorithm.</td>
<td>Debug1</td>
</tr>
<tr>
<td>efidecompress</td>
<td>Decompress a file using EFI Decompression Algorithm.</td>
<td>Debug1</td>
</tr>
<tr>
<td>else</td>
<td>Conditionally execute commands if a previous if condition was false.</td>
<td>1</td>
</tr>
<tr>
<td>endif</td>
<td>End a conditional block started with if.</td>
<td>1</td>
</tr>
<tr>
<td>endfor</td>
<td>End a loop stated with for in a script.</td>
<td>1</td>
</tr>
<tr>
<td>exit</td>
<td>Exits the UEFI Shell environment and returns control to the parent that launched the UEFI Shell.</td>
<td>1</td>
</tr>
<tr>
<td>for</td>
<td>Start a loop in a script</td>
<td>1</td>
</tr>
<tr>
<td>getmtc</td>
<td>Return current monotonic count.</td>
<td>3</td>
</tr>
<tr>
<td>goto</td>
<td>Go to a label in a script</td>
<td>1</td>
</tr>
<tr>
<td>guid</td>
<td>Displays all registered EFI GUIDs.</td>
<td>Debug1</td>
</tr>
<tr>
<td>help</td>
<td>Displays the list of commands that are built into the UEFI Shell.</td>
<td>3</td>
</tr>
<tr>
<td>hexedit</td>
<td>Full screen hex editor for files, block devices, or memory.</td>
<td>Debug1</td>
</tr>
<tr>
<td>if</td>
<td>Conditionally execute script statements.</td>
<td>1</td>
</tr>
<tr>
<td>ifconfig</td>
<td>Displays or modifies the current IP configuration.</td>
<td>Network1</td>
</tr>
<tr>
<td>ipconfig</td>
<td>Displays or modifies the current IP configuration.</td>
<td>Network1</td>
</tr>
<tr>
<td>load</td>
<td>Loads a UEFI driver into memory.</td>
<td>2</td>
</tr>
<tr>
<td>loadpcirom</td>
<td>Loads a PCI Option ROM from the specified file.</td>
<td>Debug1</td>
</tr>
<tr>
<td>ls</td>
<td>Lists a directory’s contents or file information.</td>
<td>2</td>
</tr>
<tr>
<td>map</td>
<td>Defines a mapping between a user-defined name and a device handle.</td>
<td>2</td>
</tr>
<tr>
<td>mem</td>
<td>Displays the contents of system or device memory.</td>
<td>Debug1</td>
</tr>
<tr>
<td>memmap</td>
<td>Displays the memory map maintained by the EFI environment.</td>
<td>Debug1</td>
</tr>
<tr>
<td>Command</td>
<td>Description</td>
<td>Required at Shell Level or Profile</td>
</tr>
<tr>
<td>---------</td>
<td>-------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>alias</td>
<td>Displays, creates, or deletes aliases in the UEFI Shell environment</td>
<td>3</td>
</tr>
<tr>
<td>attrib</td>
<td>Displays or changes the attributes of files or directories.</td>
<td>2</td>
</tr>
<tr>
<td>mkdir</td>
<td>Creates one or more new directories.</td>
<td>2</td>
</tr>
<tr>
<td>mm</td>
<td>Displays or modifies MEM/MMIO/IO/PCI/PCIe address space.</td>
<td>Debug1</td>
</tr>
<tr>
<td>mode</td>
<td>Displays or changes the console output device mode.</td>
<td>Debug1</td>
</tr>
<tr>
<td>mv</td>
<td>Moves one or more files to a destination within a file system.</td>
<td>2</td>
</tr>
<tr>
<td>openinfo</td>
<td>Displays the protocols and agents associated with a handle.</td>
<td>Driver1</td>
</tr>
<tr>
<td>parse</td>
<td>Parse data returned from standard formatted output</td>
<td>2</td>
</tr>
<tr>
<td>pause</td>
<td>Pause script execution and wait for a keypress</td>
<td>3</td>
</tr>
<tr>
<td>pci</td>
<td>Displays PCI device list or PCI function configuration space.</td>
<td>Debug1</td>
</tr>
<tr>
<td>ping</td>
<td>Check response of an IP address.</td>
<td>Network1</td>
</tr>
<tr>
<td>reconnect</td>
<td>Reconnects drivers to the specific device.</td>
<td>Driver1</td>
</tr>
<tr>
<td>reset</td>
<td>Resets the system.</td>
<td>2</td>
</tr>
<tr>
<td>rm</td>
<td>Deletes one or more files or directories.</td>
<td>2</td>
</tr>
<tr>
<td>sermode</td>
<td>Sets serial port attributes.</td>
<td>Debug1</td>
</tr>
<tr>
<td>set</td>
<td>Used to maintain the environment variables that are available from the EFI environment.</td>
<td>2</td>
</tr>
<tr>
<td>setsize</td>
<td>Set the size of a file</td>
<td>Debug1</td>
</tr>
<tr>
<td>setvar</td>
<td>Change value of UEFI variable</td>
<td>Debug1</td>
</tr>
<tr>
<td>shift</td>
<td>Shift to the 2nd set of positional parameters</td>
<td>1</td>
</tr>
<tr>
<td>smbiosview</td>
<td>Displays SMBIOS information.</td>
<td>Debug1</td>
</tr>
<tr>
<td>time</td>
<td>Displays or sets the current time for the system.</td>
<td>2/3</td>
</tr>
<tr>
<td>timezone</td>
<td>Displays or sets time zone information.</td>
<td>2/3</td>
</tr>
<tr>
<td>touch</td>
<td>Updates the time and date on a file to the current time and date.</td>
<td>3</td>
</tr>
<tr>
<td>type</td>
<td>Sends the contents of a file to the standard output device.</td>
<td>3</td>
</tr>
</tbody>
</table>
5.1.1 Explanation of Command Description Layout

The description of each command is composed of four sections: **Summary, Usage, Options, Description, Notes, Status Codes Returned** and **Examples**.

**Summary** is a brief explanation of the function of the command. **Usage** describes how the command is used. **Options** gives a complete description of each of the command-line options. **Description** describes the details of the command.

Examples give sample usage of the command. The output may differ from the output listed in this section.

5.1.2 Shell Command-Line Options

The following table describes the standard command-line options. No command supports all options, but when needed, the following option parameters are used:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-b, -break</td>
<td>Pause after each page.</td>
</tr>
<tr>
<td>-q, -quiet</td>
<td>The command will suppress all output.</td>
</tr>
<tr>
<td>-sfo</td>
<td>Standard Format Output. Instead of normal output, the shell command will output using the standard format described Appendix D.</td>
</tr>
<tr>
<td>-t, -terse</td>
<td>Terse Output. The shell command will restrict additional informative content.</td>
</tr>
<tr>
<td>-v, -verbose</td>
<td>Verbose Output. The shell command will output additional informative content.</td>
</tr>
<tr>
<td>-?</td>
<td>Help. For more information on how command-line help is supported, see section 3.11.2.</td>
</tr>
</tbody>
</table>

Command-line options that begin with the `_` character are implementation-specific.
5.2 Shell Command Profiles

Shell command profiles are groups of shell commands that are identified by a profile name. Profile names that begin with the '_' character are reserved for individual implementations. For information on how profiles are identified, see section 3.3.2 (Supported Profiles).

For more information on how profiles are updated when new commands are installed, see section 3.11

There are four standard profiles:

<table>
<thead>
<tr>
<th>Profile Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Driver1</td>
<td>Standard set of driver-related commands.</td>
</tr>
<tr>
<td>Debug1</td>
<td>Standard set of debug commands.</td>
</tr>
<tr>
<td>Network1</td>
<td>Standard set of networking-related commands.</td>
</tr>
<tr>
<td>Install1</td>
<td>Standard set of commands to aid installation.</td>
</tr>
</tbody>
</table>

5.3 Shell Commands

alias

Summary

Displays, creates, or deletes aliases in the UEFI Shell environment.

Usage

```
alias [-d|-v] [alias-name] [command-name]
```

Options

```
alias-name
   Alias name

command-name
   Original command’s name or original command’s file name/directory.

-d
   Delete an alias. command-name should not be present.

-v
   Make the alias volatile.
```
Description

This command displays, creates, or deletes aliases in the UEFI Shell environment. An alias provides a new name for an existing UEFI Shell command or UEFI application. Once the alias is created, it can be used to run the command or launch the UEFI application.

There are some aliases that are predefined in the UEFI Shell environment. These aliases provide the MS-DOS and UNIX equivalent names for the file manipulation commands. See Built-In Aliases (section 3.6.4) for more details.

Aliases will be retained even after exiting the shell unless the --v option is specified. If --v is specified then the alias will not be valid after leaving the shell.

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_OUT_OF_RESOURCES</td>
<td>A request to set a variable in a non-volatile fashion could not be completed. The resulting non-volatile request has been converted into a volatile request.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
</tbody>
</table>

Examples

To display all aliases in the UEFI Shell environment:

```
Shell> alias
md  : mkdir
rd  : rm
```

To create an alias in the UEFI Shell environment:

```
Shell> alias myguid guid
Shell> alias
md  : mkdir
rd  : rm
myguid : guid
```

To delete an alias in the UEFI Shell environment:

```
Shell> alias -d myguid
Shell> alias
md  : mkdir
rd  : rm
```

To add a volatile alias in the current EFI environment, which has a star * at the line head. This volatile alias will disappear at next boot.

```
Version 2.0
```
Shell> alias -v fs0 floppy
Shell> alias
  md : mkdir
  rd : rm
* fs0 : floppy
attrib

Summary
Displays or changes the attributes of files or directories.

Usage
attrib [+a|-a] [+s|-s] [+h|-h] [+r|-r] [file...] [directory...]

Options
  +a|-a
  Set or clear the 'archive' attribute
  +s|-s
  Set or clear the 'system' attribute
  +h|-h
  Set or clear the 'hidden' attribute
  +r|-r
  Set or clear the 'read-only' attribute
  file
  File name (wild cards are permitted)
  directory
  Directory name (wildcards are permitted)

Description
This command displays and sets the attributes of files or directories. The following four attribute types are supported in the UEFI file system:
  • Archive [A]
  • System [S]
  • Hidden [H]
  • Read only [R]
If a file (in general meaning) is a directory, then it is also shown to have the attribute [D].
If any file in the file list that is specified in the command line does not exist, attrib will continue processing the remaining files while reporting the error.
If no file or directory is specified, then all of the files in the current directory are displayed.
If no attribute is specified, then the attributes of the files will be displayed.
### Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The requested file was not found.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_WRITE_PROTECTED</td>
<td>The media that the action was to take place on is write-protected.</td>
</tr>
</tbody>
</table>

### Examples

- To display the attributes of a directory:
  ```plaintext
  fs0:\> attrib fs0:\
  attrib:D fs0:\
  ```

- To display the attributes of all files and sub-directories in the current directory:
  ```plaintext
  fs0:\> attrib *
  attrib: AS fs0:\serial.efi
  attrib:DA fs0:\test1
  attrib: A HR fs0:\bios.inf
  attrib: A fs0:\VerboseHelp.txt
  attrib: AS fs0:\IsaBus.efi
  ```

- To add the system attribute to all files with extension '.efi':
  ```plaintext
  fs0:\> attrib +s *.efi
  ```

- To remove the read only attribute from all files with extension '.inf':
  ```plaintext
  fs0:\> attrib -r *.inf
  attrib: A H fs0:\bios.inf
  ```
**bcfg**

**Summary**

Manages the boot and driver options that are stored in NVRAM.

**Usage**

```bash
cfg driver|boot [dump [-v]] [add # file "desc"] [addp # file "desc"]
[addh # handle "desc"] [rm #] [mv # #] [-opt # [[filename]|["data"] | [KeyData <ScanCode UnicodeChar>*]]
```

**Options**

- **driver**
  Display/modify the driver option list

- **boot**
  Display/modify the boot option list

- **dump**
  Display the option list

- **-v**
  Display the option list with extra info including the optional data.

- **add**
  Add an option. The # is the number of options to add in hexadecimal. The file name of the UEFI application/driver for the option. The quoted parameter is the description of the option being added.

- **addh**
  Add an option that refers to the driver specified by handle. The # is the number of options to add, in hexadecimal. The handle is the driver handle, in hexadecimal. The device path for the option is retrieved from the handle. The quoted parameter is the description of the option being added.

- **addp**
  Add an option that refers to a specific file. Only the portion of the device path starting with the hard drive partition is placed in the option. The # is the number of options to add, in hexadecimal. The quoted parameter is the description of the option being added.

- **rm**
  Remove an option. The parameter lists the number of the options to remove in hexadecimal.

- **mv**
  Move an option. The first numeric parameter is the number of the option to move in hexadecimal. The second numeric parameter is the new number of the option being moved.

- **-opt**
  Display/modify the optional data associated with a driver or boot option. Followed either by the file name of the file which contains the binary data to be
associated with the driver or boot option optional data or else the quote-delimited data which will be associated with the driver or boot option optional data.

**KeyData**
The packed value associated with a hot-key. This is the equivalent of the EFI_KEY_DATA value in the UEFI specification.

**ScanCode**
This is the UEFI-defined Scan code portion of the EFI_INPUT_KEY structure. This value is directly associated with the preceding KeyData value and there may be 1 to 4 entries per the UEFI specification. When one instance of this parameter has a non-zero value, the paired UnicodeChar value will have a zero-based value.

**UnicodeChar**
This is the Unicode value for the character associated with the preceding KeyData value. There may be 1 to 4 entries per the UEFI specification. When one instance of this parameter has a non-zero value, the paired ScanCode value will have a zero-based value.

**Description**
Manages the boot and driver options stored in NVRAM. This command can display the _Boot### or Driver###_ environment variables by using the dump option. The add option can be used to add a new _Boot### or Driver###_ environment variable. The rm option can be used to delete a _Boot### or Driver###_ environment variable, and finally, then mv option can be used to reorder the _Boot### and Driver###_ environment variables. The add, rm, and mv options also update the _BootOrder or DriverOrder_ environment variables as appropriate.

**Examples**

To display driver options:

```
Shell> bcfg driver dump
```

To display boot options:

```
Shell> bcfg boot dump
```

To display verbose of boot options:

```
Shell> bcfg boot dump -v
```

To add a driver option #5

```
Shell> bcfg driver add 5 mydriver.efi "My Driver"
```

To add a boot option #3

```
Shell> bcfg boot add 3 osloader.efi "My OS"
```

To remove boot option #3

```
Shell> bcfg boot rm 3
```

To move boot option #3 to boot option #7

```
Shell> bcfg boot mv 3 7
```

To assign a CTRL-B hot-key to boot option #3.
Shell> bcfg boot -opt 3 0x40000200 0 0x42

### Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The requested option was not found.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_UNSUPPORTED</td>
<td>The action as requested was unsupported.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_OUT_OF_RESOURCES</td>
<td>There was insufficient free space for the request to be completed.</td>
</tr>
</tbody>
</table>

Version 2.0
cd

Summary
Displays or changes the current directory.

Usage
cd [path]

Options
path
The relative or absolute directory path.

Description
This command changes the current working directory that is used by the UEFI Shell environment. If a file system mapping is specified, then the current working directory is changed for that device. Otherwise, the current working directory is changed for the current device.

If path is not present, then the current working directory (including file system mapping) is displayed to standard out.

The table below describes the conventions that are used to refer to the directory, its parent, and the root directory in the UEFI Shell environment.

Table 13 Conventions for Directory Names

<table>
<thead>
<tr>
<th>Convention</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>.</td>
<td>Refers to the current directory</td>
</tr>
<tr>
<td>..</td>
<td>Refers to the directory’s parent</td>
</tr>
<tr>
<td>\</td>
<td>Refers to the root of the current file system</td>
</tr>
</tbody>
</table>

The current working directory is maintained in the environment variable %cwd%. See “Current Directory” (section 3.5) for more information.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>
Examples

To change the current filesystem to the mapped fs0 filesystem:
   Shell> fs0:

To change the current directory to subdirectory 'efi':
   fs0:\> cd efi

To change the current directory to the parent directory (fs0:\):
   fs0:\efi\> cd ..

To change the current directory to 'fs0:\efi\tools':
   fs0:\> cd efi\tools

To change the current directory to the root of the current fs (fs0):
   fs0:\efi\tools\> cd \
   fs0:\>

To change volumes with cd will not work! For example:
   fs0:\efi\tools\> cd fs1:\  !!!! will not work !!!!
   must first type fs1: then cd to desired directory

To move between volumes and maintain the current path.
   fs0:\> cd efi\tools
   fs0:\efi\tools\> fs1:
   fs1:\> cd tmp
   fs1:\tmp> cp fs0:*,* .
   copies all of files in fs0:\efi\tools into fs1:\tmp directory
**cls**

**Summary**
Cleans the standard output and optionally changes the background color.

**Usage**
`cls [color]`

**Options**

<table>
<thead>
<tr>
<th>color</th>
<th>New background color</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Black</td>
</tr>
<tr>
<td>1</td>
<td>Blue</td>
</tr>
<tr>
<td>2</td>
<td>Green</td>
</tr>
<tr>
<td>3</td>
<td>Cyan</td>
</tr>
<tr>
<td>4</td>
<td>Red</td>
</tr>
<tr>
<td>5</td>
<td>Magenta</td>
</tr>
<tr>
<td>6</td>
<td>Yellow</td>
</tr>
<tr>
<td>7</td>
<td>Light gray</td>
</tr>
</tbody>
</table>

**Description**
This command clears the standard output device with an optional background color attribute. If `color` is not specified, then the background color does not change.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation.</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The requested file was not found.</td>
</tr>
</tbody>
</table>

**Examples**

To clear standard output without changing the background color:

```
fs0:\> cls
```

To clear standard output and change the background color to cyan:

```
fs0:\> cls 3
```

To clear standard output and change the background to the default color:

```
fs0:\> cls 0
```
**comp**

**Summary**

Compares the contents of two files on a byte for byte basis.

**Usage**

```comp [-b] file1 file2```

**Options**

- `-b` - Display one screen at a time
- `file1` - First file name (directory name or wildcards not permitted)
- `file2` - Second file name (directory name or wildcards not permitted)

**Description**

This command compares the contents of two files in binary mode. It displays up to 10 differences between the two files. For each difference, up to 32 bytes from the location where the difference starts is dumped. It will exit immediately if the lengths of the compared files are different.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The function operated as expected.</td>
</tr>
<tr>
<td>SHELL_NOT_EQUAL</td>
<td>The files were not identical.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The requested file was not found.</td>
</tr>
</tbody>
</table>

**Examples**

To compare two files with different lengths:

```
fs0:\> comp bios.inf legacy.inf
    Compare fs0:\bios.inf to fs0:\legacy.inf
    Difference #1: File sizes mismatch
    [difference(s) encountered]
```

To compare two files with the same contents:

```
fs0:\> comp bios.inf rafter.inf
    Compare fs0:\bios.inf to fs0:\rafter.inf
    [no difference encountered]
```

To compare two files with the same length but different contents:
fs0:\> comp bios.inf bios2.inf
Compare fs0:\bios.inf to fs0:\bios2.inf
Difference #1:
File1: fs0:\bios.inf
00000000: 5F
File2: fs0:\bios2.inf
00000000: 33
Difference #2:
File1: fs0:\bios.inf
0000000C: 00 00 00 00
File2: fs0:\bios2.inf
0000000C: 25 32 03 03
[difference(s) encountered]
connect

Summary

Binds a driver to a specific device and starts the driver.

Usage

connect [[DeviceHandle] [DriverHandle] | [-c] | [-r]]

Options

-r

Recursively scan all handles and check to see if any loaded or embedded driver can match the specified device. If so, the driver will be bound to the device. Additionally, if more device handles are created during the binding, these handles will also be checked to see if a matching driver can bind to these devices as well. The process is repeated until no more drivers are able to connect to any devices. However, without the option, the newly created device handles will not be further bound to any drivers.

-c

Connect console devices found in the EFI global variables (see UEFI specification, chapter 3)

DeviceHandle

Device handle (a hexadecimal number). If not specified, then all device handles will be connected.

DriverHandle

Driver handle (a hexadecimal number). If not specified, then all matching drivers will be bound to the specified device. If specified, then this driver will have the highest priority.

Description

This command binds a driver to a specific device and starts the driver. If the -r flag is used, then the connection is done recursively until no further connections between devices and drivers are made. If the -c flag is used, then the connect command will bind the proper drivers to the console devices that are described in the EFI environment variables. The example below shows the typical output from the verbose help for this command.

If only a single handle is specified and the handle has an EFI_DRIVER_BINDING_PROTOCOL on it, then the handle is assumed to be a driver handle. Otherwise, it is assumed to be a device handle.

If no parameters are specified, then the command will attempt to bind all proper drivers to all devices without recursion. Each connection status will be displayed.
Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

Examples

- To connect all drivers to all devices recursively:
  Shell> connect -r

- To display all connections:
  Shell> connect
  ConnectController(1) : Status = Success
  ConnectController(2) : Status = Success
  ConnectController(3) : Status = Success
  ...
  ConnectController(3D) : Status = Success

- To connect drivers with 0x17 as highest priority to all the devices they can manage:
  Shell> connect 17

- To connect all possible drivers to device 0x19:
  Shell> connect 19

- To connect drivers with 0x17 as highest priority to device 0x19 they can manage:
  Shell> connect 19 17

- To connect console devices described in the UEFI Shell environment variables:
  Shell> connect -c
**cp**

**Summary**
Copies one or more source files or directories to a destination.

**Usage**

```bash
cp [-r] [-q] src [src...] [dst]
```

**Options**

- **src**
  Source file/directory name (wildcards are permitted)

- **dst**
  Destination file/directory name (wildcards are not permitted). If not specified, then the current working directory is assumed to be the destination. If there are more than one directory specified, then the last is always assumed to be the destination.

- **-r**
  Recursive copy.

- **-q**
  Quiet copy (no prompt)

**Description**

This command copies one or more source files or directories to a destination. If the source is a directory, the `-r` flag must be specified. If `-r` is specified, then the source directory will be recursively copied to the destination (which means that all subdirectories will be copied). If a destination is not specified, then the current working directory is assumed to be the destination.

If any target file (not directory) already exists, there will be a prompt asking the user to confirm replacing the file. The following four choices are available:

- Yes: Replace the file.
- No: Do not replace the file.
- All: Replace the existing files in all subsequent cases.
- Cancel: Do not replace any existing files in all subsequent cases.

If there are multiple source files/directories, the destination must be a directory.

If an error occurs, then the copying process will stop immediately.

When executing in a script, the default is `-q`. 
When copying to another directory, the directory must already exist.

### Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_OUT_OF_RESOURCES</td>
<td>There was insufficient space to save the requested file at the destination.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation.</td>
</tr>
<tr>
<td>SHELL_WRITE_PROTECTED</td>
<td>An attempt was made to create a file on media that was write-protected.</td>
</tr>
</tbody>
</table>

### Examples

**Note:**

1. `-r` must be specified if `src` is a directory. If `-r` is specified, then the source directory will be recursively copied to the destination.

   `Src` itself will be copied. ????

- To display the contents of current directory first of all:
  
  ```
  fs0:\> ls
  Directory of: fs0:\
  06/18/01 01:02p <DIR> 512 efi
  06/18/01 01:02p <DIR> 512 test1
  06/18/01 01:02p <DIR> 512 test2
  06/13/01 10:00a 28,739 IsaBus.efi
  06/13/01 10:00a 32,838 IsaSerial.efi
  06/18/01 08:04p 29 temp.txt
  06/18/01 08:05p <DIR> 512 test
  3 File(s) 61,606 bytes
  4 Dir(s)
  ```

- To copy a file in the same directory, but change the file name:
  
  ```
  fs0:\> cp temp.txt readme.txt
  copying fs0:\temp.txt -> fs0:\readme.txt
  - [ok]
  ```

- To copy multiple files to another directory:
  
  ```
  fs0:\> cp temp.txt isaBus.efi \test
  copying fs0:\temp.txt -> fs0:\test\temp.txt
  - [ok]
  copying fs0:\isaBus.efi -> fs0:\test\IsaBus.efi
  - [ok]
  ```

- To copy multiple directories recursively to another directory:
fs0:\> cp -r test1 test2 boot \test
copying fs0:\test1 -> fs0:\test\test1
  - [ok]
copying fs0:\test1\test1.txt -> fs0:\test\test1\test1.txt
  - [ok]
copying fs0:\test2 -> fs0:\test\test2
copying fs0:\test2\test2.txt -> fs0:\test\test2\test2.txt
  - [ok]
copying fs0:\boot -> fs0:\test\boot
copying fs0:\boot\shell.efi -> fs0:\test\boot\shell.efi
  - [ok]

To see the results of the above operations:
fs0:\> ls \test
Directory of: fs0:\test
06/18/01  01:01p <DIR>            512  .
06/18/01  01:01p <DIR>             0  ..
01/28/01  08:21p <DIR>            512  test1
01/28/01  08:21p <DIR>            512  test2
01/28/01  08:21p <DIR>            512  boot
01/28/01  08:23p                   29  temp.txt
01/28/01  08:23p               28,739  IsaBus.efi
  2 File(s)      28,828 bytes
  5 Dir(s)

Shell>
date

Summary
Displays and sets the current date for the system.

Usage
```
date [mm/dd/yy] [yy] [-sfo]
```

Options
- **mm**
  Month of the date to be set (1-12)
- **dd**
  Day of the date to be set (1-31)
- **yy/yyyy**
  Year of the date to be set. If only two digits, then 9x = 199x, otherwise 20xx.
- **-sfo**
  Standard-format output. See "Related Definitions" below.

Description
This command displays and/or sets the current date for the system. If no parameters are used, it shows the current date. If a valid month, day, and year are provided, then the system's date will be updated. Detailed rules are listed below:

Except for numeric characters and /, all other characters in the argument are invalid. The Shell will report an error if the number is in the wrong month/date/year range.

Space before or after the numeric character is not allowed. Inserting a space into the number is invalid.

Repeated zeros are allowed before the number. For example:
```
Shell > date 0000008/000004/000097
Shell > date 08/04/2097
```

The year range is greater than or equal to 1998. Two numeric characters indicate the year. Numbers below 98 are regarded as 20xx, and numbers equal to or above 98 are regarded as 19xx. 00 means 2000. For example:
Shell > date 8/4/97
Shell > date
08/04/2097
Shell >

Shell > date 8/4/98
Shell > date
08/04/1998
Shell >

The range of valid years is from 1998–2099.

Standard-Format Output

The standard-format from the date command has a single table: Date, with the following columns:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Day (from 1-31)</td>
</tr>
<tr>
<td>3</td>
<td>Month (from 1-12)</td>
</tr>
<tr>
<td>4</td>
<td>Year (from 1998-2099)</td>
</tr>
</tbody>
</table>

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_DEVICE_ERROR</td>
<td>There was a hardware error preventing the completion of this command</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

Examples

- To display the current date in the system:
  
  ```
  fs0:\> date
  06/18/2001
  ```

- To set the date with long year format:

  ```
  fs0:\> date 01/01/2050
  ```

- To set the date with short year format:

  ```
  fs0:\> date 06/18/01
  ```
**dblk**

**Summary**
Displays the contents of one or more blocks from a block device.

**Usage**
```
dblk device [lba] [blocks] [-b]
```

**Options**
- `device`
  Block device name
- `lba`
  Index of the first block to be displayed (a hexadecimal number). The default is 0.
- `blocks`
  Number of blocks to be displayed (a hexadecimal number). The default is 0. If larger than 0x10, then only 0x10 are displayed.
- `-b`
  Display one screen at a time.

**Description**
This command displays the contents of one or more blocks from a block device. `lba` and `blocks` should be typed in hex value. If `lba` is not specified, block #0 is assumed. If `blocks` is not specified, then only 1 block will be displayed. The maximum number of blocks that can be displayed at one time is 0x10.

If an MBR is found on the block, the partition information will be printed after all the block contents have been displayed.

If the block is a FAT partition, some FAT parameters will be displayed (label, systemid, oemid, sectorsize, clustersize, media etc) after all the blocks have been displayed.

**Examples**
- To display one block of blk0, beginning from block 0:
  ```
  Shell>dblk blk0
  ```

- To display one block of fs0, beginning from block 0x2:
  ```
  Shell>dblk fs0 2
  ```

- To display 0x5 blocks of fs0, beginning from block 0x12:
  ```
  Shell>dblk fs0 12 5
  ```

- To display 0x10 blocks of fs0, beginning from block 0x12:
  ```
  Shell>dblk fs0 12 10
  ```

- The attempt to display more than 0x10 blocks will display only 0x10 blocks:
Shell>dblk fs0 12 20

• To display one block of blk2, beginning from the first block (blk0):
fs1:\tmps1> dblk blk2 0 1
LBA 0000000000000000 Size 00000200 bytes BlkIo 3F0CEE78
00000000: EB 3C 90 4D 53 44 4F 53-35 2E 30 00 02 04 08 00
*...MDDOS5.0.....*
00000010: 02 00 02 00 00 F8 CC 00-3F 00 FF 00 3F 00 00 00
*.......
00000030: 4D 53 44 4F 53-35 2E 30 00 02 04 08 00
*...MDDOS5.0.....*
00000040: 02 00 02 00 00 F8 CC 00-3F 00 FF 00 3F 00 00 00
*.......
00000050: 38 4E 24 7D 2D 24 8B C1 99-E8 3C 01 72 1C 83 ED 3A
*8N..7.<.r...*
00000060: 66 03 46 1C 66 8B D0 66-C1 EA 10 EB 5E 0F B6 C8
*...f.F.f..f....*
00000070: 4A 4A 8A 46 0D 32 E4 F7-E2 03 46 FC 13 56 FE EB
*..JA..6....*
00000080: 5E 0B 49 75 06 F8 C3-41 52 6F 64 69 66 69 6C 6C
*^.Iu...*
00000090: 66 03 46 1C 66 8B D0 66-C1 EA 10 EB 5E 0F B6 C8
*...f.F.f..f....*
000000A0: 6B 03 46 74 7D 2D 24 8B C1 99-E8 3C 01 72 1C 83 ED 3A
*...k..7.<.r...*
000000B0: 66 03 46 1C 66 8B D0 66-C1 EA 10 EB 5E 0F B6 C8
*...f.F.f..f....*
000000C0: 6B 03 46 74 7D 2D 24 8B C1 99-E8 3C 01 72 1C 83 ED 3A
*...k..7.<.r...*
000000D0: 66 03 46 1C 66 8B D0 66-C1 EA 10 EB 5E 0F B6 C8
*...f.F.f..f....*
000000E0: 6B 03 46 74 7D 2D 24 8B C1 99-E8 3C 01 72 1C 83 ED 3A
*...k..7.<.r...*
000000F0: 66 03 46 1C 66 8B D0 66-C1 EA 10 EB 5E 0F B6 C8
*...f.F.f..f....*
00000100: 6B 03 46 74 7D 2D 24 8B C1 99-E8 3C 01 72 1C 83 ED 3A
*...k..7.<.r...*
00000110: 66 03 46 1C 66 8B D0 66-C1 EA 10 EB 5E 0F B6 C8
*...f.F.f..f....*
00000120: 66 03 46 1C 66 8B D0 66-C1 EA 10 EB 5E 0F B6 C8
*...f.F.f..f....*
00000130: 66 03 46 1C 66 8B D0 66-C1 EA 10 EB 5E 0F B6 C8
*...f.F.f..f....*
Fat 16 BPB FatLabel: 'NO NAME' SystemId: 'FAT16' OemId: 'MSDOS5.0'
SectorSize 200 SectorsPerCluster 4 ReservedSectors 8 # Fats 2
Root Entries 200 Media F8 Sectors 32F8E SectorsPerFat CC
SectorsPerTrack 3F Heads 255
del

Summary

Internal alias for the `rm` command.
devices

Summary
Displays the list of devices managed by UEFI drivers.

Usage
devices [-b] [-l XXX]

Options
-\b - Display one screen at a time
-\l XXX - Display devices using the specified ISO 639-2 language

Description
The command prints a list of devices that are being managed by drivers that follow
the UEFI Driver Model.

Examples
• To display all devices compliant with the EFI Driver Model
Shell> devices
C T D
T Y C I
R P F A
L E G G #P #D #C Device Name
== = = = == == ==
============================================================= 20 R - - 1 13 VenHw(58C518B1-76F3-11D4-BCEA-0080C73C8881)
3D D - - 3 - Primary Console Input Device
3E D - - 3 - Primary Console Output Device
64 B - - 1 6 2 "UGA Window 1"
65 B - - 1 6 2 UGA Window 2"
66 B - - 1 1 1 EFI_WIN_NT_SERIAL_PORT=COM1
67 B - - 1 1 1 COM1
68 B - - 1 4 2 PC-ANSI Serial Console
69 D - - 1 - - EFI_WIN_NT_SERIAL_PORT=COM2
6E D - - 1 - - EFI_WIN_NT_PHYSICAL_DISKS=e:RW;262144;512
6F D - - 1 - - EFI_WIN_NT_CPU_MODEL=Intel(R) Processor Model
70 D - - 1 - - EFI_WIN_NT_CPU_SPEED=3000
71 D - - 1 - - EFI_MEMORY_SIZE=64
72 D - - 1 - - EFI_MEMORY_SIZE=64

Standard-Format Output

Table 15 Standard-Format Output for devices

<table>
<thead>
<tr>
<th>Column Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>The handle number of the EFI device</td>
</tr>
<tr>
<td></td>
<td>The device type:</td>
</tr>
<tr>
<td>---</td>
<td>----------------</td>
</tr>
<tr>
<td>R</td>
<td>Root Controller</td>
</tr>
<tr>
<td>B</td>
<td>Bus Controller</td>
</tr>
<tr>
<td>D</td>
<td>Device Controller</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A managing driver supports the Driver Configuration Protocol: Yes (Y) or No (N)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A managing driver supports the Driver Diagnostics Protocol: Yes (Y) or No (N)</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>The number of parent controllers for this device</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>The number of this type of devices.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>The number of child controllers produced by this device</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>The name of the device from the Component Name Protocol</th>
</tr>
</thead>
</table>
**devtree**

**Summary**
Displays the tree of devices compliant with the UEFI Driver Model.

**Usage**
```sh
devtree [-b] [-d] [-l XXX] [DeviceHandle]
```

**Options**
- **DeviceHandle**: Display device tree below a certain handle
- **-b**: Display one screen at a time
- **-d**: Display device tree using device paths
- **-l**: Display device tree using the specified language

**Description**
This command prints a tree of devices that are being managed by drivers that follow the UEFI Driver Model. By default, the devices are printed in device names that are retrieved from the Component Name Protocol. If the option `-d` is specified, the device paths will be printed instead.

**Examples**
- To display the tree of all devices compliant with the UEFI Driver Model:
  ```sh
  Shell> devtree
  ```
- To display the tree of all devices below device 28 compliant with the UEFI Driver Model:
  ```sh
  Shell> devtree 28
  ```
- To display the tree of all devices compliant with the UEFI Driver Model one screen at a time:
  ```sh
  Shell> devtree -b
  ```
dh

Summary
Displays the device handles in the UEFI environment.

Usage
dh [\(-l\) <lang>] [handle | -p <prot_id>] [-d] [-v]

Options
- handle
  Specific handle to dump information about (a hexadecimal number). If not present, then all information will be dumped.
-\(p\)
  Dumps all handles of a protocol specified by the GUID.
-\(d\)
  Dumps UEFI Driver Model-related information.
-\(l\)
  Dumps information using the language codes, as described in Appendix M of the UEFI specification.
-\(sfo\)
  Displays information as described in "Standard-Format Output" below.
-\(v\), -\(verbose\)
  Dumps verbose information about a specific handle.

Description
This command displays the device handles in the EFI environment. If this command is used with a specific handle number, the details of all the protocols that are associated with that device handle are displayed. Otherwise, the -\(p\) option can be used to list the device handles that contain a specific protocol.

If neither -\(p\) or handle is specified, then all handles will be displayed.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

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Examples

To display all handles and display one screen at a time:

Shell> dh -b
Handle dump
1: Image(DXE Core)
2: PwCl PwFileSys PwVolBlk DevPath(MemMap(1:1B50000-1D4FFC8))
3: Image(Ebc)
4: DevPath(MemMap(1:1CA0000-1CB0000))
5: Image(WinNtThunk)
6: WinNtThunk DevPath(.76F3-11D4-BCEA-0080C73C8881)
7: Image(WinNtBusDriver) DriverBinding
...

To display the detailed information on handle 0x30:

Shell> dh 30
Handle 30 (01AF5308)
IsaIo
   ROM Size.......: 00000000
   ROM Location..: 00000000
   ISA Resource List :
      IO : 000003F8-000003FF Attr : 00000000
      INT : 00000000-00000000 Attr : 00000000
dpath
   PNP Device Path for PnP
   HID A0341D0, UID 0x0
   Hardware Device Path for PCI
   PNP Device Path for PnP
   HID 50141D0, UID 0
   AsStr: 'Acpi(PNP0A03,0)/Pci(1F|0)/Acpi(PNP0501,0)'

To display all handles with 'diskio' protocol:

Shell> dh -p diskio
Handle dump by protocol 'Diskio'
15: DiskIo BlkIo DevPath(.i(3|1)/Ata(Secondary,Master))
16: DiskIo BlkIo DevPath(.5/PCI(0|0)/Scsi(Pun0,Lun0))
44: DiskIo BlkIo Fs DevPath(.ABD0-01C0-507B-9E5F8078F531)
   ESP
45: DiskIo BlkIo Fs DevPath(.i(Pun0,Lun0)/HD(Part4,SigG0))
   ESP
17: DiskIo BlkIo DevPath(.PCI(3|1)/Ata(Primary,Master))

To display all handles with 'Image' protocol and break when the screen is full:
Shell> dh -p Image -b
Handle dump by protocol 'image'
1: Image(DXE Core)
5: Image(WinNtThunk)
7: Image(WinNtBusDriver) DriverBinding
8: Image(Metronome)
A: Image(IsaBus) DriverBinding
B: Image(WinNtConsole) DriverBinding
...

**Standard-Format Output**

When using the `-sfo` command-line option, the dh shell command will produce one of two tables: HandlesInfo or HandleInfo. The table columns are described in the following table:

<table>
<thead>
<tr>
<th>Column Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Driver Name. Name of driver producing the handle.</td>
</tr>
<tr>
<td>3</td>
<td>Controller Name. Name of controller producing the handle.</td>
</tr>
<tr>
<td>4</td>
<td>Handle Number. Integer handle number.</td>
</tr>
<tr>
<td>5</td>
<td>Device Path. Device path associated with the handle.</td>
</tr>
<tr>
<td>6</td>
<td>Protocol Identifiers. Semicolon-delimited list of protocol identifiers or GUIDs.</td>
</tr>
</tbody>
</table>
dir

Summary

An internal alias for the `ls` command.
disconnect

Summary

Disconnects one or more drivers from the specified devices.

Usage

```
disconnect DeviceHandle [DriverHandle [ChildHandle]]
```

Options

```
DeviceHandle
    Device handle (a hexadecimal number). If not specified, then disconnect
    DriverHandle.

DriverHandle
    Driver handle (a hexadecimal number)

ChildHandle
    Child handle of a device (a hexadecimal number). If not specified, then all child
    handles of DeviceHandle will be disconnected.

-r
    Disconnect all drivers from all devices.
```

Description

This command disconnects one or more drivers from the specified devices. If the `-r`
option is used, all drivers are disconnected from all devices in the system. The
following example is the typical output from the help for this command.

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

Examples

- To disconnect all drivers from all devices:
  ```
  Shell> disconnect -r
  ```

- To disconnect all drivers from device 0x28:
  ```
  fs0:\> disconnect 28
  ```

- To disconnect driver 0x17 from device 0x28:
fs0:\> disconnect 28 17

- To disconnect driver 0x17 from controlling the child 0x32 of device 0x28

fs0:\> disconnect 28 17 32
**dmem**

**Summary**
Displays the contents of system or device memory.

**Usage**
```
dmem [-b] [address] [size] [-MMIO]
```

**Options**
- **address**
  Starting address in hexadecimal format
- **size**
  Number of bytes to display in hexadecimal format
- **-b**
  Display one screen at a time
- **-MMIO**
  Forces address cycles to the PCI bus

**Description**
This command displays the contents of system memory or device memory. *address* and *size* should be typed in hex value. If Address is not specified, then the contents of the EFI System Table are displayed. Otherwise, memory starting at Address is displayed.  If *size* is not specified, then it defaults to 512 bytes.  If *MMIO* is not specified, then main system memory is displayed through the use of the *EFI_PCI_ROOT_BRIDGE_IO_PROTOCOL*. 
Examples

To display the EFI system table pointer entries:

```
fs0:\> dmem
```

Memory Address 00000003FF7D808 200 Bytes

```
3FF7D808: 49 42 49 20 53 59 54 54-02 00 01 00 78 00 00 00 *IBI
SYST....x...*
3FF7D818: 5C 3E 6A FE 00 00 00 00-08 2E 1B 3F 00 00 00 00
\.........................*
3FF7D828: 26 00 0C 00 00 00 00-00-88 D3 1A 3F 00 00 00 00
*&.........................*
3FF7D838: A8 CE 1A 3F 00 00 00 00-08 88 3F 00 00 00 00
*.........................*
3FF7D848: 28 EE 1A 3F 00 00 00 00-08 DD 1A 3F 00 00 00 00
*(.........................*
3FF7D858: A8 EB 1A 3F 00 00 00 00-18 C3 3F 00 00 00 00
*.........................*
3FF7D868: 28 EE 1A 3F 00 00 00 00-08 DD 1A 3F 00 00 00 00
*.........................*
3FF7D878: 08 DA F7 3F 00 00 00 00-74 61 6C 88 00 00 00
*.........................*
3FF7D888: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D898: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D8A8: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D8B8: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D8C8: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D8D8: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D8E8: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D8F8: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D908: 65 76 6E 74 00 00 00 00-02 02 00 60 00 00 00 00
*.........................*
3FF7D918: 18 7F 1A 3F 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D928: 10 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D938: 10 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D948: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D958: 50 6F 1A 3F 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D968: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
3FF7D978: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00
*.........................*
*.................*
*.................*

Valid EFI Header at Address 000000003FF7D808
--------------------------------------------
System: Table Structure size 00000078 revision 00010002
ConIn (3F1AD388) ConOut (3F1AF288) StdErr (3F1ADD08)
Runtime Services 000000003F3FC118
Boot Services 000000003F3F4B00
SAL System Table 000000003F22760
ACPI Table 000000003FFD9FC0
ACPI 2.0 Table 00000000000E2000
MPS Table 00000000000F0020
SMBIOS Table 00000000000F0020

* To display memory contents from 1af3088 with size of 16 bytes:
Shell> dmem laf3088 16
Memory Address 0000000001AF3088 16 Bytes
01AF3088: 49 42 49 20 53 59 53 40-00 00 00 18 00 00 00 *IBI
SYST........*
01AF3098: FF 9E D7 9B 00 00

* To display memory mapped IO contents from 1af3088 with size of 16 bytes:
Shell> dmem laf3088 16 -MMIO

3FF7D988: 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00 00
3FF7D9F8: 00 00 00 00 00 00 00-70 68 06 30 A0 00 00 00
*.......ph.0....*
dmpstore

Summary

Manages all UEFI NVRAM variables.

Usage

dmpstore [-b] [-d] [-all | ([variable] [-guid guid])]
dmpstore [-all | ([variable] [-guid guid])] -s file
dmpstore [-all | ([variable] [-guid guid])] -l file

Options

-b
  Display one screen at a time

variable
  Specifies the name of the variable name. May be a literal name or a pattern as
  specified in the MetaiMatch() function of the
  EFI_UNICODE_COLLATION2_PROTOCOL.

-guid
  Specifies the GUID of the variables to be displayed. The GUID has the standard
  text format. If guid is not specified and -all is not specified, then the
  EFI_GLOBAL_VARIABLE GUID is assumed.

-all
  Indicates that all variables should be dumped, including those with a different
  GUID that EFI_GLOBAL_VARIABLE.

-d
  Delete variables

-s
  Save variables to file

-l
  Load and set variables from file

Description

This command is used to manage the UEFI NVRAM variables. The variables to display
or delete depend on the command line options, as specified in the following table:

<table>
<thead>
<tr>
<th>Table 17 Variable command line options</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Variable</strong></td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>---</td>
</tr>
<tr>
<td>---</td>
</tr>
</tbody>
</table>

Version 2.0
| --- | X | --- | All variables with the specified GUID will be operated on. |
| X | --- | --- | The variable with the GUID EFI_GLOBAL_VARIABLE and the name(s) Variable will be operated on. |
| X | X | --- | The variable with the specified GUID and name Variable will be operated on. |

The variable value is printed as hexadecimal dump.

Option \(-d\) is used to delete variables. Option \(-s\) and \(-l\) are used to save and load variables to and from file. The variable name can be specified when using these variables so that the operation only takes effect on that variable.
**drivers**

**Summary**
Displays a list of information for drivers that follow the UEFI Driver Model in the UEFI environment.

**Usage**
drivers [-l XXX]

**Options**
- `-l`
  Displays drivers using the language code XXX, which has the format specified by Appendix M of the UEFI specification.
- `-sfo`
  Displays information as described in "Standard-Format Output" below.

**Description**
This command displays a list of information for drivers that follow the UEFI Driver Model in the UEFI environment. The list includes:

- The handle number of the EFI driver.
- The version number of the EFI driver.
- The driver type. A B in this column indicates a bus driver, and D indicates a device driver.
- Indicates that the driver supports the Driver Configuration Protocol.
- Indicates that the driver supports the Driver Diagnostics Protocol.
- The number of devices that this driver is managing.
- The number of child devices that this driver has produced.
- The name of the driver from the Component Name Protocol.
- The file path from which the driver was loaded.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

*Version 2.0*
Examples

- To display the list:
  
  Shell> drivers
  
<table>
<thead>
<tr>
<th>T</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>00000010 D - - 1  - Platform Console Management</td>
</tr>
<tr>
<td>Driver</td>
<td>ConPlatform</td>
</tr>
<tr>
<td>3A</td>
<td>00000010 D - - 1  - Platform Console Management</td>
</tr>
<tr>
<td>Driver</td>
<td>ConPlatform</td>
</tr>
<tr>
<td>3B</td>
<td>00000010 B - - 1 1 Console Splitter</td>
</tr>
<tr>
<td>Driver</td>
<td>ConSplitter</td>
</tr>
<tr>
<td>3C</td>
<td>00000010 ? - - - - Console Splitter</td>
</tr>
<tr>
<td>Driver</td>
<td>ConSplitter</td>
</tr>
<tr>
<td>3D</td>
<td>00000010 B - - 1 1 Console Splitter</td>
</tr>
<tr>
<td>Driver</td>
<td>ConSplitter</td>
</tr>
<tr>
<td>3E</td>
<td>00000010 ? - - - - Console Splitter</td>
</tr>
<tr>
<td>Driver</td>
<td>ConSplitter</td>
</tr>
<tr>
<td>42</td>
<td>00000010 D - - 1  - UGA Console</td>
</tr>
<tr>
<td>Driver</td>
<td>GraphicsConsole</td>
</tr>
<tr>
<td>43</td>
<td>00000010 ? - - - - Serial Terminal</td>
</tr>
<tr>
<td>Driver</td>
<td>Terminal</td>
</tr>
<tr>
<td>44</td>
<td>00000010 D - - 1  - Generic Disk I/O Driver</td>
</tr>
<tr>
<td>Driver</td>
<td>DiskIo</td>
</tr>
<tr>
<td>45</td>
<td>00000010 D - - 1  - FAT File System Driver</td>
</tr>
<tr>
<td>Driver</td>
<td>Fat</td>
</tr>
<tr>
<td>46</td>
<td>00000010 ? - - - - ISA Bus Driver</td>
</tr>
<tr>
<td>Driver</td>
<td>IsaBus</td>
</tr>
<tr>
<td>49</td>
<td>00000010 ? - - - - ISA Serial</td>
</tr>
<tr>
<td>Driver</td>
<td>IsaSerial</td>
</tr>
<tr>
<td>4C</td>
<td>00000010 B - - 1 1 PCI Bus Driver</td>
</tr>
<tr>
<td>Driver</td>
<td>PciBus</td>
</tr>
<tr>
<td>55</td>
<td>00000010 D X X 1  - Windows Block I/O</td>
</tr>
<tr>
<td>Driver</td>
<td>WinNtBlockIo</td>
</tr>
<tr>
<td>56</td>
<td>00000010 ? - - - - Windows Text Console</td>
</tr>
<tr>
<td>Driver</td>
<td>WinNtConsole</td>
</tr>
<tr>
<td>57</td>
<td>00000010 ? - - - - Windows Serial I/O</td>
</tr>
<tr>
<td>Driver</td>
<td>WinNtSerialIo</td>
</tr>
<tr>
<td>58</td>
<td>00000010 D - - 1  - Windows Simple File System Driver</td>
</tr>
<tr>
<td>Driver</td>
<td>WinNtSimpleFileSystem</td>
</tr>
<tr>
<td>59</td>
<td>00000010 B - - 1 3 Windows Bus</td>
</tr>
<tr>
<td>Driver</td>
<td>WinNtBusDriver</td>
</tr>
<tr>
<td>5F</td>
<td>00000010 D - - 1  - Windows Universal Graphics</td>
</tr>
<tr>
<td>Adapter</td>
<td>WinNtUga</td>
</tr>
</tbody>
</table>

Standard-Format Output

The standard-format output for the drivers command produces a single table: Drivers. The following columns are described:

<table>
<thead>
<tr>
<th>Table 18 Drivers command table</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Column Number</strong></td>
</tr>
<tr>
<td>-------------------</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5</td>
</tr>
<tr>
<td>6</td>
</tr>
<tr>
<td>Column</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>7</td>
</tr>
<tr>
<td>8</td>
</tr>
<tr>
<td>9</td>
</tr>
<tr>
<td>10</td>
</tr>
</tbody>
</table>
**drcfg**

**Summary**

Configures the driver using the platform's underlying configuration infrastructure.

**Usage**

```
drcfg [-l XXX] [-c] [-f <Type>|-v|-s] [DriverHandle [DeviceHandle [ChildHandle]]] [-i filename] [-o filename]
```

**Options**

**Type**

The type of default configuration options to force on the controller.

- 0 - Standard Defaults.
- 1 - Manufacturing Defaults.
- 2 - Safe Defaults.
- 4000-FFFF - Custom Defaults.

**DriverHandle**

The handle of the driver to configure

**DeviceHandle**

The handle of a device that DriverHandle is managing

**ChildHandle**

The handle of a device that is a child of DeviceHandle

- **-c**
  
  Configure all child devices

- **-l**
  
  Configure using the ISO 3066 language specified by XXX

- **-f**
  
  Force defaults

- **-v**
  
  Validate options

- **-s**
  
  Set options

- **-i**
  
  Receive configuration updates from an input file
Export the settings of the specified driver instance to a file

Description

This command invokes the platform's Configuration infrastructure. The table below describes the values for the Type parameter. Other values depend on the driver’s implementation.

### Table Default Values for the “Type” Parameter

<table>
<thead>
<tr>
<th>Value</th>
<th>Type of Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0x0000</td>
<td>Standard Defaults</td>
<td>Places a controller in a state that is prepared for normal operation in a platform.</td>
</tr>
<tr>
<td>0x0001</td>
<td>Manufacturing Defaults</td>
<td>Optional type that places the controller in a configuration that is suitable for a manufacturing and test environment.</td>
</tr>
<tr>
<td>0x0002</td>
<td>Safe Defaults</td>
<td>Optional type that places a controller in a safe configuration that has the greatest probability of functioning correctly in a platform.</td>
</tr>
<tr>
<td>0x0003 – 0x3FFF</td>
<td>Reserved</td>
<td>Specification reserved range of default values</td>
</tr>
<tr>
<td>0x4000 – 0xFFFF</td>
<td>Custom Defaults</td>
<td>Optional type that places the controller in a configuration that has custom characteristics.</td>
</tr>
</tbody>
</table>

### Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_UNSUPPORTED</td>
<td>The action as requested was unsupported.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

### Examples

To display the list of devices that are available for configuration:

```
Shell> drvcfg
```

To display the list of devices and child devices that are available for configuration:

```
Shell> drvcfg -c
```

To force defaults on all devices:

```
Shell> drvcfg -f 0
```

To force defaults on all devices that are managed by driver 0x17:

```
Version 2.0
```
Shell> drvcfg "f 0 17

To force defaults on device 0x28 that is managed by driver 0x17:
Shell> drvcfg "f 0 17 28

To force defaults on all child devices of device 0x28 that is managed by driver 0x17:
Shell> drvcfg "f 0 17 28 "c
To force defaults on child device 0x30 of device 0x28 that is managed by driver 0x17:
   Shell> drvcfg -f 0 17 28 30

To validate options on all devices:
   Shell> drvcfg -v

To validate options on all devices that are managed by driver 0x17:
   Shell> drvcfg -v 17

To validate options on device 0x28 that is managed by driver 0x17:
   Shell> drvcfg -v 17 28

To validate options on all child devices of device 0x28 that is managed by driver 0x17:
   Shell> drvcfg -v 17 28 -c

To validate options on child device 0x30 of device 0x28 that is managed by driver 0x17:
   Shell> drvcfg -v 17 28 30

To set options on device 0x28 that is managed by driver 0x17:
   Shell> drvcfg -s 17 28

To set options on child device 0x30 of device 0x28 that is managed by driver 0x17:
   Shell> drvcfg -s 17 28 30

To set options on device 0x28 that is managed by driver 0x17 in English:
   Shell> drvcfg -s 17 28 -l eng

To set options on device 0x28 that is managed by driver 0x17 in Spanish:
   Shell> drvcfg -s 17 28 -l spa
**drvdia**

**Summary**

Invokes the Driver Diagnostics Protocol.

**Usage**

```
 Drvdia [-c] [-l XXX] [-s|-e|-m] [DriverHandle [DeviceHandle
 [ChildHandle]]]
```

**Options**

- `DriverHandle`
  - The handle of the driver to diagnose
- `DeviceHandle`
  - The handle of a device that DriverHandle is managing
- `ChildHandle`
  - The handle of a device that is a child of DeviceHandle
- `-c`
  - Diagnose all child devices
- `-l`
  - Diagnose using the ISO 639-2 language specified by XXX
- `-s`
  - Run diagnostics in standard mode
- `-e`
  - Run diagnostics in extended mode
- `-m`
  - Run diagnostics in manufacturing mode

**Description**

This command invokes the Driver Diagnostics Protocol.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>
Examples

To display the list of devices that are available for diagnostics:
   Shell> drvdiag

To display the list of devices and child devices that are available for diagnostics:
   Shell> drvdiag -c

To run diagnostics in standard mode on all devices:
   Shell> drvdiag -s

To run diagnostics in standard mode on all devices in English:
   Shell> drvdiag -s -l eng

To run diagnostics in standard mode on all devices in Spanish:
   Shell> drvdiag -s -l spa

To run diagnostics in standard mode on all devices and child devices:
   Shell> drvdiag -s -c

To run diagnostics in extended mode on all devices:
   Shell> drvdiag -e

To run diagnostics in manufacturing mode on all devices:
   Shell> drvdiag -m

To run diagnostics in standard mode on all devices managed by driver 0x17:
   Shell> drvdiag -s 17

To run diagnostics in standard mode on device 0x28 managed by driver 0x17:
   Shell> drvdiag -s 17 28

To run diagnostics in standard mode on all child devices of device 0x28 managed by driver 0x17:
   Shell> drvdiag -s 17 28 -c

To run diagnostics in standard mode on child device 0x30 of device 0x28 managed by driver 0x17:
   Shell> drvdiag -s 17 28 30
echo

Summary
Controls whether or not script commands are displayed as they are read from the script file and prints the given message to the display.

Usage
```
echo [-on|-off]
echo [message]
```

Options

- `message`
  Message to display

- `-on`
  Enables display when reading commands from script files.

- `-off`
  Disables display when reading commands from script files.

Description
The first form of this command controls whether or not script commands are displayed as they are read from the script file. If no argument is given, the current "on" or "off" status is displayed. The second form prints the given message to the display.

Note
This command does not change the value of the environment variable `lasterror`.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
</tbody>
</table>

Examples

- To display a message string of 'Hello World':
  ```
  fs0:/> echo Hello World
  Hello World
  ```

- To turn command echoing on:
  ```
  fs0:/> echo -on
  ```

- To execute HelloWorld.nsh, and display when reading lines from the script file:
fs0\> HelloWorld.nsh
+HelloWorld.nsh> echo Hello World
Hello World

- To turn command echoing off:
  fs0\> echo -off

- To display the current echo setting:
  fs0\> echo
  Echo is off
**edit**

**Summary**

Full screen editor for ASCII or UCS-2 files.

**Usage**

```plaintext
edit [file]
```

**Options**

`file`

Name of file to be edited. If none is specified, then an empty file will be created with a default file name.

**Description**

This command allows a file to be edited using a full screen editor. The editor supports both UCS-2 and ASCII file types. The following example shows typical output for help on this command.

**Examples**

- To edit the 'shell.log' file:
  ```plaintext
  fs0:\> edit shell.log
  ```
eficompress

Summary

Compress a file using EFI Compression Algorithm.

Usage

eficompress infile outfile

Options

infile  - Filename for uncompressed input file
outfile - Filename for compressed output file

Description

This command is used to compress a file using EFI Compression Algorithm and write the compressed form out to a new file.

Examples

- To compress a file named 'uncompressed' to file 'compressed':
  fs0: \> eficompress uncompressed compressed
efidecompress

Summary
Decompress a file using EFI Decompression Algorithm.

Usage
`efidecompress infile outfile`

Options

`infile`
Filename of compressed input file

`outfile`
Filename of decompressed output file

Description
This command is used to decompress a file using EFI Decompression Algorithm and write the decompressed form out to a new file.

Examples

- To decompress a file named 'compressed' to file 'uncompressed':
  `fs0:\> efidecompress compressed uncompressed`
**exit**

**Summary**

Exits the UEFI Shell or the current script.

**Usage**

```
exit [/b] [exit-code]
```

**Options**

`/b`

Indicates that only the current UEFI shell script should be terminated. Ignored if not used within a script.

`exit-code`

If exiting a UEFI shell script, the value that will be placed into the environment variable `lasterror`. If exiting an instance of the UEFI shell, the value that will be returned to the caller. If not specified, then 0 will be returned.

**Description**

This command exits the UEFI Shell or, if `/b` is specified, the current script.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>exit-code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Exit normally</td>
</tr>
<tr>
<td>exit-code</td>
<td>The value specified as an option.</td>
</tr>
</tbody>
</table>
for

Usage

for %indexvar in set
  command [arguments]
  [command [arguments]]
  ...
endfor

for %indexvar run (start end [step])
  command [arguments]
  [command [arguments]]
endfor

Description

The for command executes one or more commands for each item in a set of items. The set may be text strings or filenames or a mixture of both, separated by spaces (if not in a quotation). If the length of an element in the set is between 0 and 256, and if the string contains wildcards, the string will be treated as a file name containing wildcards, and be expanded before command is executed.

If after expansion no such files are found, the literal string itself is kept. Indexvar is any alphabet character from 'a' to 'z' or 'A' to 'Z', and they are case sensitive. It should not be a digit (0-9) because %digit will be interpreted as a positional argument on the command line that launches the script. The namespace for index variables is separate from that for environment variables, so if indexvar has the same name as an existing environment variable, the environment variable will remain unchanged by the for loop.

Each command is executed once for each item in the set, with any occurrence of %indexvar in the command replacing with the current item. In the second format of for ... endfor statement, indexvar will be assigned a value from start to end with an interval of step. start and end can be any integer whose length is less than 7 digits excluding sign, and it can also applied to step with one exception of zero. step is optional, if step is not specified it will be automatically determined by following rule, if start <= end then step = 1, otherwise step = -1. start, end and step are divided by space.

Note

This command may only be used in scripts.

This command does not change the value of the environment variable lasterror.
Examples

# Sample for loop - listing all .txt files

echo -off
for %a in *.txt
  echo %a exists
endfor

If in current directory, there are 2 files named file1.txt and file2.txt, the output of the sample script will be:
Sample1> echo -off
file1.txt exists
file2.txt exists

Theoretically it is legal for 2 nested for commands to use the same alphabet letter as their index variable, for instance, a.

# Sample for loop from 1 to 3 with step 1
# echo -off
# for %a run (1 3)
# echo %a
# endfor

# Sample for loop from 3 down to 1 with step -1
# echo -off
# for %a run (3 1 -1)
# echo %a
# endfor

# Sample for loop - 2 nested for using same index variable
# echo -off
# for %a in value1 value2
#   for %a in value3 value4
#     echo %a
#   endfor
# endfor

When processing first for and before seeing the endfor, the index variable %a has the value "value1", so in second for, the %a has been already defined and it will be replaced with the current value of %a. The string after substitution becomes for value1 in value3 value4, which is not a legal for command. Thus only when the value of %a is also a single alphabet letter, the script will be executed without error. If 2 independent for commands use the same index variable, when the second for is encountered, the first for has already freed the variable so there'll be no problem in this case.
getmtc

Usage

getmtc

Description

This command displays the current monotonic counter value. The lower 32 bits increment every time this command is executed. Every time the system is reset, the upper 32 bits will be incremented, and the lower 32 bits will be reset to 0. The following example is typical output from help for this command.

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_DEVICE_ERROR</td>
<td>The underlying device was not working correctly.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
</tbody>
</table>

Examples

fs0:\> getmtc
100000000
fs0:\> getmtc
100000001
**goto**

**Usage**

`goto label`

**Description**

The `goto` command directs script file execution to the line in the script file after the given `label`. The command is not supported from the interactive shell. A `label` is a line beginning with a colon (`:`). It can appear either after the `goto` command, or before the `goto` command. The search for `label` is done forward in the script file, from the current file position. If the end of the file is reached, the search resumes at the top of the file and continues until `label` is found or the starting point is reached. If `label` is not found, the script process terminates and an error message is displayed. If a `label` is encountered but there is no `goto` command executed, the `label` lines are ignored. Using `goto` command to jump into another `for` loop is not allowed, but jumping into an `if` statement is legal.

**Note**

The `goto` command is only valid in script files.

**Examples**

```bash
# This is a script
goto Done

:Done
```

`cleanup.nsh`
guid

Summary
Displays all registered EFI GUIDs.

Usage
guid [-b]

Options
- b
  Display one screen at a time

Description
This command displays a list of all the GUIDs that have been registered with the UEFI environment.

Examples

Note:
1. Only displays the GUIDs included in the core EFI build at the time the core was built. Additional GUIDs may have been added by the BIOS integrator. Any GUIDs that are not in the original core build or were added by a new protocol loaded by the user will show up as an Unknown Device.
2. The GUID with a '*' at end means that there will probably be dump information or token available for the protocol to this GUID. The 'dh' command can be used to dump this information.

fs0:\> guid -b
DevIo            : AF6AC311-84C3-11D2-8E3C-00A0C969723B
diskio           : CE345171-BA0B-11D2-8E4F-00A0C969723B
blkio            : 964E5B21-6459-11D2-8E39-00A0C969723B  *
txtin            : 387477C1-69C7-11D2-8E39-00A0C969723B
txtout           : 387477C2-69C7-11D2-8E39-00A0C969723B  *
fs               : 964E5B22-6459-11D2-8E39-00A0C969723B
load             : 56EC3091-954C-11D2-8E3F-00A0C969723B
image            : 5B1B31A1-9562-11D2-8E3F-00A0C969723B  *
...

Examples
Shell> exit
help

Summary
Displays the list of commands that are built into the UEFI Shell.

Usage

Options

  cmd
  Command to display help about.

  pattern
  Pattern which describes the commands to be displayed.

  special
  Displays a list of the special characters used in the shell command line.

  -usage
  Display the usage information for the command. The same as specifying -section:NAME and -section:SYNOPSIS

  -section sectionname
  Display the specified section of the help information. Standard section names can be found in Appendix B.

Description
The help command displays information about one or more shell commands.

If no other options are specified, each command will be displayed along with a brief description of its function. If -verbose is specified, then all help information for the specified commands. If -section is specified, only the help section specified will be displayed (see below). If -usage is specified, then the command, a brief description and the usage will be displayed.

The help text is gathered from UCS-2 text files found in the directory where the shell or shell command executable was located. The files have the name command-name.man, where command-name is the name of the shell command. The files follow a sub-set of the MAN page format, as described below.

If no option is specified, then only the NAME section of the page is reproduced.

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>The help was displayed</td>
</tr>
<tr>
<td>1</td>
<td>No command help was displayed</td>
</tr>
</tbody>
</table>

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Examples

To display the list of commands in the UEFI Shell and break after one screen:

Shell> help -b

? - Displays commands list or verbose help of a command
alias - Displays, creates, or deletes aliases in the UEFI Shell
attrib - Displays or changes the attributes of files or directories
cd - Displays or changes the current directory
cls - Clears the standard output with an optional background color
connect - Binds an EFI driver to a device and starts the driver
copy - Copies one or more files/directories to another location
...

To display help information of a Shell command - ls:

Shell> help ls
Shell> ? ls
Shell> ls -?

To display the list of commands that start with character ‘p’:

Shell> help p*
pause - Prints a message and suspends for keyboard input
hexedit

Summary
Full screen hex editor for files, block devices, or memory.

Usage
`hexedit [-f] filename [-d diskname offset size] | [-m address size]`

Options
- `-f`
  Name of file to edit
- `-d`
  Disk block to edit:
  
  **DiskName** - Name of disk to edit (for example fs0)
  
  **Offset** - Starting block number (beginning from 0)
  
  **Size** - Number of blocks to be edited
- `-m`
  Memory region to edit:
  
  **Address** - Starting 32-bit memory address (beginning from 0)
  
  **Size** - Size of memory region to be edited in bytes

Description
This command allows a file, block device, or memory region to be edited. The region being edited is displayed as hexadecimal bytes, and the contents can be modified and saved. The following example shows typical output for help on this command.

Examples
- To edit a file in hex mode:
  `fs0:
  > hexedit test.bin`
- To edit block device fs0 starting at block 0 with size of 2 blocks:
  `fs0:
  > hexedit -d fs0 0 2`
- To edit memory region starting at address 0x00000000 with size of 2 bytes:
  `fs0:
  > hexedit -m 0 2`
if

Controls which script commands will be executed based on provided conditional expressions.

Usage

```plaintext
if [not] exist filename then
    command [arguments]
    [command [arguments]]
    ...
[else
    command [arguments]
    [command [arguments]]
    ...]
endif

if [/[i]/] [not] string1 == string2 then
    command [arguments]
    [command [arguments]]
    ...
[else
    command [arguments]
    [command [arguments]]
    ...]
endif

if [/[i]/][/s] ConditionalExpression then
    command [arguments]
    [command [arguments]]
    ...
[else
    command [arguments]
    [command [arguments]]
    ...]
Endif
```

Options

**ConditionalExpression**

Conditional expression, as described in "Expressions", below.

Description

The *if* command executes one or more *commands* before the *else* or *endif* commands, if the specified condition is true; otherwise *commands* between *else* (if present) and *endif* are executed.

In the first usage of *if*, the *exist* condition is true when the file specified by *filename* exists. The *filename* argument may include device and path information. Also wildcard expansion is supported by this form. If more than one file matches the wildcard pattern, the condition evaluates to TRUE.
In the second usage, the \texttt{string1 == string2} condition is true if the two strings are identical. Here the comparison can be case sensitive or insensitive, it depends on the optional switch \texttt{/i}. If \texttt{/i} is specified, it will compare strings in the case insensitive manner; otherwise, it compares strings in the case sensitive manner.

In the third usage, general purpose comparison is supported using expressions optionally separated by \texttt{and} or \texttt{or}. Since \texttt{<} and \texttt{>} are used for redirection, the expressions use common two character (FORTRAN) abbreviations for the operators (augmented with unsigned equivalents):

### Expressions

Conditional expressions are evaluated strictly from left to right. Complex conditionals requiring precedence may be implemented as nested \texttt{ifs}.

The expressions used in the third usage have the following syntax:

\[
\text{conditional-expression} ::= \text{expression} | \\
\text{expression and expression} \\
\text{expression or expression}
\]

\[
\text{expression} ::= \text{expr} | \\
\text{not expr}
\]

\[
\text{expr} ::= \text{item binop item} | \\
\text{boolfunc}(\text{string})
\]

\[
\text{item} ::= \text{mapfunc}(\text{string}) | \\
\text{string}
\]

\[
\text{mapfunc} ::= \text{efierror} | \text{pierror} | \text{oemerror}
\]

\[
\text{boolfunc} ::= \text{isint} | \text{exists} | \text{available} | \text{profile}
\]

\[
\text{binop} ::= \text{gt} | \text{lt} | \text{eq} | \text{ne} | \text{ge} | \text{le} | \text{==} | \text{ugt} | \text{ult} | \text{uge} | \text{ule}
\]

### Comparisons

By default, comparisons are done numerically if the strings on both sides of the operator are numbers (as defined below) and in case sensitive character sort order otherwise. Spaces separate the operators from operands.

The \texttt{/s} option forces string comparisons and the \texttt{/i} option forces case-insensitive string comparisons. If either of these is used, the signed or unsigned versions of the operators have the same results. The \texttt{/s} and \texttt{/i} apply to the entire line and must

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appear at the start of the line (just after the `if` itself). The two may appear in either order.

When performing comparisons, the Unicode Byte Ordering Character is ignored at the beginning of any argument.

**Table 19 Comparison Operators**

<table>
<thead>
<tr>
<th>Operator</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>gt</code></td>
<td>Greater than</td>
</tr>
<tr>
<td><code>ugt</code></td>
<td>Unsigned Greater than</td>
</tr>
<tr>
<td><code>lt</code></td>
<td>Less than</td>
</tr>
<tr>
<td><code>ult</code></td>
<td>Unsigned Less than</td>
</tr>
<tr>
<td><code>ge</code></td>
<td>Greater than or equal</td>
</tr>
<tr>
<td><code>uge</code></td>
<td>Unsigned greater than or equal</td>
</tr>
<tr>
<td><code>le</code></td>
<td>Less than or equal</td>
</tr>
<tr>
<td><code>ule</code></td>
<td>Unsigned less than or equal</td>
</tr>
<tr>
<td><code>ne</code></td>
<td>Not equal</td>
</tr>
<tr>
<td><code>eq</code></td>
<td>Equals (semantically equivalent to <code>==</code>)</td>
</tr>
<tr>
<td><code>==</code></td>
<td>Equals (semantically equivalent to <code>eq</code>)</td>
</tr>
</tbody>
</table>

**Error Mapping Functions**

These functions are used to convert integers into UEFI, PI or OEM error codes, as defined by Appendix D of the UEFI specification.

**Table 20 Functions used to convert integers into UEFI, PI or OEM error codes**

<table>
<thead>
<tr>
<th>Function</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>UefiError</code></td>
<td>Sets top nibble of parameter to 0100 binary (0x8)</td>
</tr>
<tr>
<td><code>PiError</code></td>
<td>Sets top nibble of parameter to 1010 binary (0xA)</td>
</tr>
<tr>
<td><code>OemError</code></td>
<td>Sets top nibble of parameter to 1100 binary (0xC)</td>
</tr>
</tbody>
</table>

Each function maps the small positive parameter into its equivalent error classification as described in Appendix D of the UEFI Specification. For example,

```plaintext
if %lasterror% == EfiError(8) then # Check for write protect.
```

These functions may only be used to modify operators in comparisons.

**Boolean Functions**

The following built-in Boolean functions are also available:
Table 21 Boolean Functions

<table>
<thead>
<tr>
<th>Function</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>IsInt</td>
<td>Evaluates to true if the parameter string that follows is a number (as defined below) and false otherwise.</td>
</tr>
<tr>
<td>Exists</td>
<td>Evaluates to true if the file specified by string exists is in the current working directory or false if not.</td>
</tr>
<tr>
<td>Available</td>
<td>Evaluates to true if the file specified by string is in the current working directory or current path.</td>
</tr>
<tr>
<td>Profile</td>
<td>Determines whether the parameter string matches one of the profile names in the profiles environment variable.</td>
</tr>
</tbody>
</table>

No spaces are allowed between function names and the open parenthesis, between the open parenthesis and the string or between the string and the closed parenthesis. Constant strings containing spaces must be quoted.

**Note:** To avoid ambiguity and current or future incompatibility, users are strongly encouraged to surround constant strings that contain parenthesis with quotes in *if* statements.

**Conditional Expressions**

*Not* inverts the sense of only the following expression.

**Numbers**

Allowable number formats are decimal numbers and C-style case insensitive hexadecimal numbers. Numbers may be preceded by a "-" indicating a negative number. Examples:

- 13
- 46
- -0x3FFF
- 0x3fff
- 0x1234

Unsigned values must be less than $2^{64}$. Signed integer values are bounded by $\pm2^{63}$. Numbers are internally represented in two’s compliment form. The representation of the number in the string has no bearing on the way that number is treated in an numeric expression – type is assigned by the operator. So, for example, `-1 lt 2` is true but `-1 ult 2` is false.
Examples

# Example script for "if" command usages 1 and 2
#
if exist fs0:\myscript.nsh then
  myscript myarg1 myarg2
endif
if %myvar% == runboth then
  myscript1
  myscript2
else
  echo "\%myvar\% != runboth"
endif

In this example, if the script file myscript.nsh exists in fs0:\, this script will be
launched with 2 arguments, myarg1 and myarg2. After that, environment variable
\%myvar\% is checked to see if its value is runboth, if so, script myscript1 and
myscript2 will be executed one after the other, otherwise a message \%myvar\% !=
runboth is printed.

# Example script for "if" command usage 3
#
:Redo
echo Enter 0-6 or q to quit
# assumes "input y" stores a character of user input into variable y
InputCh MyVar
if x%MyVar% eq x then
  echo Empty line. Try again
  goto Redo
endif
if IsInt(%MyVar%) and %MyVar% le 6 then
  myscript1 %MyVar%
goto Redo
endif
if /i %MyVar% ne q then
  echo Invalid input
goto Redo
endif

In this example, the script requests user input and uses the if command for input
validation. It checks for empty line first and then range checks the input. Note also
the use of the /i in the last comparison so "Q" and "q" are both supported.

Note: This command does not change the value of the environment variable
lasterror.

Note: The if command is only available in scripts.

Note: The else command is optional in an if/else statement.
ifconfig

Summary
Modify the default IP address of the UEFI IP4 Network Stack.

Usage
ifConfig [-?] [-c [Name]] [-l [Name]] [-s <Name> dhcp | <static <IP> <Mask> <Gateway>> [permanent]]

Options
Name
Adapter name, i.e., eth0
-c [Name] Clear the configuration for all or specified interface, and the network stack for related interface will fall back to the DHCP as default.
-l [Name] List the configuration for all or the specified interface.
-s <Name> static <IP> <SubnetMask> <GatewayMask> [permanent] Use static IP4 address configuration for all or specified interface. If permanent is not present, the configuration is one-time only, otherwise this configuration request will survive a network stack reload.
-s <Name> dhcp [permanent] Use DHCP4 to request the IP4 address configuration dynamically for all interface or specified interface. If permanent is not present, the configuration is one-time only, otherwise this configuration request will survive a network stack reload.

IP
IP4 address in four integer values (each between 0-255). i.e., 192.168.0.10
SubnetMask
Subnet mask in four integer values (each between 0-255), i.e., 255.255.255.0
GatewayMask
Default gateway in four integer values (each between 0-255), i.e., 192.168.0.1

Description
This command is used to modify the default IP address for the UEFI IP4 Network Stack.
Examples

To list the configuration for the interface eth0:

Shell:\> IfConfig -l eth0

To use DHCP4 to request the IP4 address configuration dynamically for the interface eth0:

Shell:\> IfConfig -s eth0 dhcp

To use the static IP4 address configuration for the interface eth0, and this configuration survives the network reload:

Shell:\> IfConfig -s eth0 static 192.168.0.5 255.255.255.0 192.168.0.1 permanent
ipconfig

Summary
Displays or modifies the current IP configuration.

Usage
ipconfig [-r] [-b] [-c Instance] [IpAddress [-m NetMask]]

Options
- `-r`
  Restart the PXE base code and DHCP settings
- `-b`
  Display one screen at a time
- `-c`, `-controller`
  Specify the 0-based handle of the EFI_SIMPLE_NETWORK_PROTOCOL instance to use.
  
  **IpAddress**
  IP address in a.b.c.d format
- `-m`, `-mask`
  Network mask in 255.255.255.0 format

Description
This command displays or modifies the IP configuration of EFI_PXE_BASE_CODE_PROTOCOL. If no parameter is specified in the command line, it just displays the IP configuration of EFI_PXE_BASE_CODE_PROTOCOL. If **IpAddress** or **NetMask** is specified, the according configuration of EFI_PXE_BASE_CODE_PROTOCOL will be changed.

Examples
- To restart the PXE base code and refresh the DHCP settings:
  
  ```shell
  shell:~> ipconfig -r
  ```
- To display the current IP configuration:
  
  ```shell
  shell:~> ipconfig
  ```
- To modify the IP address without changing the network mask:
  
  ```shell
  shell:~> ipconfig 192.168.10.30
  ```
- To modify the IP address and network mask:
  
  ```shell
  shell:~> ipconfig 192.168.10.30 -m 255.255.255.0
  ```
load

Summary
Loads a UEFI driver into memory.

Usage
load [-nc] file [file...]

Options
-nc
Load the driver, but do not connect the driver.

File
File that contains the image of the UEFI driver (wildcards are permitted)

Description
This command loads an driver into memory. It can load multiple files at one time, and the file name supports wildcards.

If the -nc flag is not specified, this command will try to connect the driver to a proper device; it may also cause already loaded drivers be connected to their corresponding devices.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The requested file was not found</td>
</tr>
</tbody>
</table>
Examples

fs0:\> load Isabus.efi
load: Image 'fs0:\Isabus.efi' loaded at 18FE000 - Success

fs0:\> load Isabus.efi IsaSerial.efi
load: Image 'fs0:\Isabus.efi' loaded at 18E5000 - Success
load: Image 'fs0:\IsaSerial.efi' loaded at 18DC000 - Success

fs0:\> load Isa*.efi
load: Image 'fs0:\IsaBus.efi' loaded at 18D4000 - Success
load: Image 'fs0:\IsaSerial.efi' loaded at 18CB000 - Success

fs0:\> load -nc Isabus.efi
load: Image 'fs0:\Isabus.efi' loaded at 18FE000 - Success
loadpcirom

Summary

Loads a UEFI driver from a file in the format of a PCI Option ROM.

Usage

loadpcirom [-nc] romfile [romfile...]

Options

-nc - Load the ROM image but do not connect the driver
romfile - PCI option ROM image file (wildcards are permitted)

Description

This command is used to load PCI option ROM images into memory for execution. The file can contain legacy images and multiple PE32 images, in which case all PE32 images will be loaded. The example below shows typical output from help for this command.

Examples

To load a rom file ‘rom.bin’:
fs0:/> LoadPciRom rom.bin
To load ‘*.bin’ files but do not connect the driver
fs0:/> LoadPciRom -nc *.bin
Is

Summary
Lists a directory's contents or file information.

Usage
ls [-r] [-a[attrib]] [-sfo] [file]

Options
-\r
Displays recursively (including subdirectories)

-\a
Display only those files with the attributes which follow. If no attributes are listed, then all files will be listed. If -\a is not specified, then all non-system and non-hidden files will be listed. The attributes (attrib) may be one or more of the following:
1. a - Archive
2. s - System
3. h - Hidden
4. r - Read-only
5. d - Directory

-sfo
Display information as described in "Standard-Format Output" below.

file
Name of file/directory (wildcards are permitted)

Description
This command lists directory contents or file information. If no file name or directory name is specified, then the current working directory is assumed. The contents of a directory are listed if all of the following are true:
- If option -\r is not specified
- If no wildcard characters are specified in the file parameter
- If file represents an existing directory

In all other cases, the command functions as follows:
- All files/directories that match the specified name are displayed.
- The -\r flag determines whether a recursive search is performed.
- The option flag -a[attrib] tells the command to display only those files with the attributes that are specified by [attrib]. If more than one attribute is
specified, only the files that have all those attributes will be listed. If -a is followed by nothing, then all files/directories are displayed, regardless of their attributes. If -a itself is not specified, then all files except system and hidden files are displayed.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The requested file or directory was not found.</td>
</tr>
</tbody>
</table>

**Examples**

To hide files by adding the hidden or system attribute to them:

```bash
fs0:\> attrib +s +h *.efi
ASH  fs0:\IsaBus.efi
ASH  fs0:\IsaSerial.efi
```

To display all, except the files/directories with 'h' or 's' attribute:

```bash
fs0:\> ls
Directory of: fs0:\
06/18/01  09:32p                  153  for.nsh
06/18/01  01:02p <DIR>            512  efi
06/18/01  01:02p <DIR>            512  test1
06/18/01  01:02p <DIR>            512  test2
06/18/01  08:04p                   29  temp.txt
06/18/01  08:05p <DIR>            512  test
01/28/01  08:24p       r           29  readme.txt
3 File(s)         211 bytes
4 Dir(s)
```

To display files with all attributes in the current directory:

```bash
fs0:\> ls -a
Directory of: fs0:\
06/18/01  09:32p                  153  for.nsh
06/18/01  01:02p <DIR>            512  efi
06/18/01  01:02p <DIR>            512  test1
06/18/01  01:02p <DIR>            512  test2
06/18/01  10:59p                   28,739  IsaBus.efi
06/18/01  10:59p                   32,838  IsaSerial.efi
06/18/01  08:04p                   29  temp.txt
06/18/01  08:05p <DIR>            512  test
01/28/01  08:24p       r           29  readme.txt
5 File(s)      61,788 bytes
4 Dir(s)
```

To display files with read-only attributes in the current directory:
fs0:\> ls -ar
Directory of: fs0:\
06/18/01 11:14p       r       29  readme.txt
1 File(s) 29 bytes
0 Dir(s)

To display the files with attribute of 's':
fs0:\> ls -as isabus.efi
Directory of: fs0:\
06/18/01 10:59p               28,739  IsaBus.efi
1 File(s) 28,739 bytes
0 Dir(s)

To display all in fs0:\efi directory recursively:
fs0:\> ls -r -a efi

To search for files with the specified type in the current directory recursively:
fs0:\> ls -r -a *.efi –b

**Standard-Format Output**

The `ls` command will produce at least two tables: VolumeInfo and FileInfo. The VolumeInfo table reports one row for each file system volume reported. The FileInfo table reports one row for each file, including directories. The following tables describe the standard table column headings and their description. For more information on "Standard-Format Output", see Appendix D.

**Table 22 ls Standard Formatted Output (VolumeInfo)**

<table>
<thead>
<tr>
<th>Column Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Name. Standard volume label</td>
</tr>
<tr>
<td>3</td>
<td>Total Size. Total number of bytes in the volume.</td>
</tr>
<tr>
<td>4</td>
<td>Read Only. &quot;True&quot; if the volume is read-only, otherwise &quot;False&quot;.</td>
</tr>
<tr>
<td>5</td>
<td>Free Space. Total number of free bytes in the volume.</td>
</tr>
<tr>
<td>6</td>
<td>Block Size. Nominal block size by which files are typically grown, in bytes.</td>
</tr>
</tbody>
</table>

**Table 23 ls Standard Formatted Output (FileInfo)**

<table>
<thead>
<tr>
<th>Column Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Name. Complete file name &amp; directory, including the file system’s mapped name.</td>
</tr>
<tr>
<td>3</td>
<td>Logical Size. Size of the file, in bytes.</td>
</tr>
<tr>
<td>4</td>
<td>Physical Size. Size of the file in the volume, including any padding, in bytes.</td>
</tr>
<tr>
<td></td>
<td>Description</td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| 5 | Attributes. List of file attributes. The string can contain zero or more of the following (but no repeats):
|   | a – Archive  |
|   | d – Directory |
|   | h – Hidden  |
|   | r – Read-Only |
|   | s – System  |
| 6 | File Creation Time. Time when the file was created, in the format: hh:mm:ss. |
| 7 | File Creation Date. Date when the file was created, in the format: dd.mm.yyyy. |
| 8 | File Access Time. Time when the file was accessed, in the format: hh:mm:ss |
| 9 | File Access Date. Date when the file was accessed, in the format: dd.mm.yyyy |
| 10 | File Modification Time. Time when the file was modified, in the format: hh:mm:ss |
| 11 | File Modification Date. Date when the file was modified, in the format: dd.mm.yyyy. |
map

Summary

Defines a mapping between a user-defined name and a device handle.

Usage

map [-d <sname>]
map [-r][-v][-c][-f][-u][-t <type[,type...]>] [sname]
map [sname handle | mapping]

Options

sname
   MappingMapped name

handle
   The number of handle, which is same as dumped from 'dh'

mapping
   The device’s mapped name. Use this parameter to assign a new mapping to a
device. The mapping must end with a ':'.

-sfo
   Output will be formatted according to ”Standard-Format Output” below.

-t
   Shows the device mappings, filtered according to the device type. The supported
types are fp (floppy), hd (hard disk) and cd (CD-ROM). Types can be combined
by putting a comma between two types. Spaces are not allowed between types.

-d
   Deletes a mapping

-r
   Resets to default mappings

-v
   Lists verbose information about all mappings.

-c
   Shows the consistent mapping.

-f
   Shows the normal mapping (not the consistent mapping).

-u
   This option will add mappings for newly installed devices and remove mappings
for uninstalled devices but will not change the mappings of existing devices. The
user-defined mappings are also preserved.

Version 2.0
Description

This command creates a mapping between a user-defined name and a device. The most common use of this command is to create a the mapped name for devices that support a file system protocol. Once these mappings are created, the names can be used with all the file manipulation commands.

The UEFI Shell environment creates default mappings for all of the devices that support a recognized file system.

This command can be used to create additional mappings, or it can be used to delete an existing mapping with the -d option. If the map command is used without any parameters, all of the current mappings will be listed. If the --v option is used, the mappings will be shown with additional information about each device.

The -r option is used to reset all the default mappings in a system; this option is useful if the system configuration has changed since the last boot.

The -u option will add mappings for newly installed devices and remove mappings for uninstalled devices but will not change the mappings of existing devices. The user-defined mappings are also preserved. A mapping history will be saved so that the original mapping name is used for a device with a specific device path if that mapping name was used for that device path last time. The current directory is also preserved if the current device is not changed.

Each device in the system has a consistent mapping. If the hardware configuration has not changed, the device's consistent mappings do not change. If two or more machines have the same hardware configurations, the device's consistent mapping will be the same. Use the -c option to list all the consistent mappings in the system.

The mapping consist of digits and characters. Other characters are illegal.

This command support wildcards. You can use the wildcards to delete or show the mapping. However, when you assign the mapping, wildcards are forbidden.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

Standard-Format Output

If -sfo is specified, then the map command will output a single table: Mappings. The following table describes the table columns for this table:
### Table 24 Standard Formatted Output (Mappings)

<table>
<thead>
<tr>
<th>Column Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Mapped Name. The mapped device name.</td>
</tr>
<tr>
<td>3</td>
<td>Device Path. The device path which corresponds to the mapped device name.</td>
</tr>
<tr>
<td>4</td>
<td>Consistent Name. The consistent mapped name (if any) which is equivalent to <em>MappedName</em>. If <em>MappedName</em> is already a consistent mapped name, then this column is empty.</td>
</tr>
</tbody>
</table>
md

Summary

An internal alias for the `mkdir` command.
**mem**

**Summary**

This is a built-in alias for `dmem`. 
memmap

Summary
Displays the memory map maintained by the EFI environment.

Usage
memmap [-b]

Options
-b
Display one screen at a time

Description
This command displays the memory map that is maintained by the EFI environment. The EFI environment keeps track all the physical memory in the system and how it is currently being used. The EFI Specification defines a set of Memory Type Descriptors. Please see the EFI Specification for a description of how each of these memory types is used. The following example shows typical output for help on this command.

Examples
To display the system memory map:
Standard-Format Output

The standard-format output produced with the –sfo option produces two tables: MemoryMap and Summary.

Table 25 Standard-Format Output for memmap (MemoryMap)

<table>
<thead>
<tr>
<th>Column Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Type.</td>
</tr>
<tr>
<td></td>
<td>Available</td>
</tr>
<tr>
<td></td>
<td>LoaderCode</td>
</tr>
<tr>
<td></td>
<td>LoaderData</td>
</tr>
<tr>
<td></td>
<td>BootServiceCode</td>
</tr>
<tr>
<td></td>
<td>BootServiceData</td>
</tr>
<tr>
<td></td>
<td>RuntimeCode</td>
</tr>
<tr>
<td></td>
<td>RuntimeData</td>
</tr>
<tr>
<td></td>
<td>Reserved</td>
</tr>
<tr>
<td>3</td>
<td>Starting Address</td>
</tr>
<tr>
<td>4</td>
<td>Ending Address</td>
</tr>
<tr>
<td>Column Number</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-----------------------------------------------</td>
</tr>
<tr>
<td>2</td>
<td>Total Memory Size (bytes)</td>
</tr>
<tr>
<td>3</td>
<td>Reserved Memory Total Size (bytes)</td>
</tr>
<tr>
<td>4</td>
<td>Boot Service Code Total Size (bytes)</td>
</tr>
<tr>
<td>5</td>
<td>Boot Service Data Total Size (bytes)</td>
</tr>
<tr>
<td>6</td>
<td>Runtime Code Total Size (bytes)</td>
</tr>
<tr>
<td>7</td>
<td>Runtime Data Total Size (bytes)</td>
</tr>
<tr>
<td>8</td>
<td>Loader Code Total Size (bytes)</td>
</tr>
<tr>
<td>9</td>
<td>Loader Data Total Size (bytes)</td>
</tr>
<tr>
<td>10</td>
<td>Available Total Size (bytes)</td>
</tr>
</tbody>
</table>
**mkdir**

**Summary**

Creates one or more new directories.

**Usage**

```
mkdir dir [dir...]
```

**Options**

`dir`

Name of directory or directories to be created. Wildcards are not allowed.

**Description**

This command creates one or more new directories. If dir includes nested directories, then parent directories will be created before child directories. If the directory already exists, then the command will exit with an error.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_OUT_OF_RESOURCES</td>
<td>There was insufficient space on the destination to create the requested directory.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_WRITE_PROTECTED</td>
<td>An attempt was made to create a directory when the target media was write-protected.</td>
</tr>
</tbody>
</table>

**Examples**

To create a new directory:
```
fs0:\> mkdir rafter
fs0:\> ls
Directory of: fs0:\
06/18/01  08:05p <DIR>            512  test
06/18/01  11:14p       r           29  readme.txt
06/18/01  11:50p <DIR>            512  rafter
1 File(s)         211 bytes
2 Dir(s)
```

- To create multiple directories:
fs0:\> mkdir temp1 temp2
fs0:\> ls
Directory of: fs0:\

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Mode</th>
<th>Size</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>06/18/01</td>
<td>08:05p</td>
<td>-</td>
<td>512</td>
<td>test</td>
</tr>
<tr>
<td>06/18/01</td>
<td>11:14p</td>
<td>r</td>
<td>29</td>
<td>readme.txt</td>
</tr>
<tr>
<td>06/18/01</td>
<td>11:50p</td>
<td>-</td>
<td>512</td>
<td>rafter</td>
</tr>
<tr>
<td>06/18/01</td>
<td>11:52p</td>
<td>-</td>
<td>512</td>
<td>temp1</td>
</tr>
<tr>
<td>06/18/01</td>
<td>11:52p</td>
<td>-</td>
<td>512</td>
<td>temp2</td>
</tr>
</tbody>
</table>

1 File(s) 211 bytes
4 Dir(s)
**mm**

**Summary**

Displays or modifies MEM/MMIO/IO/PCI/PCIE address space.

**Usage**

```
mm address [value] [-w 1|2|4|8] [-MEM | -MMIO | -IO | -PCI | -PCIE] [-n]
```

**Options**

- **address**
  - Starting address
- **value**
  - The value to write. If not specified, then the current value will be displayed.
- **-MEM**
  - Memory Address type.
- **-IO**
  - IO Address type
- **-PCI**
  - PCI Configuration Space. The address will have the format 0x000000ssbbddffrr, where ss = Segment, bb = Bus, dd = Device, ff = Function and rr = Register. This is the same format used in the PCI command.
- **-PCIE**
  - PCI Express Configuration Space. The address will have the format 0x000000ssbbddffrrr, where ss = Segment, bb = Bus, dd = Device, ff = Function and rrr = Register.
- **-w**
  - Access Width, in bytes. 1 = byte, 2 = 2 bytes, 4 = 4 bytes, 8 = 8 bytes. If not specified, then 1 is assumed.
- **-n**
  - Non-interactive mode.

**Description**

This command allows the user to display or modify I/O register, memory contents, or PCI configuration space. The user can specify the start address and the access size they wish to perform using the **Address** parameter and **-w** option. **Address** should be typed in hex value. **-MEM** accesses system memory, **-MMIO** accesses device memory, **-IO** accesses device I/O ports, **-PCI** accesses PCI Configuration Space, and **-PCIE** accesses PCIE Configuration Space. If **-MEM, -MMIO, -IO, -PCI** and **-PCIE** are not specified, then **-MEM** is assumed.
If `Value` is specified which should be typed in hex value, this command will write this value to specified address. Otherwise when this command is executed, the current contents of `Address` are displayed. If `Value` is specified, then `-n` is assumed.

If `-n` is not specified, the command will run in interactive mode and the user has the option of modifying the contents by typing in a hex value. When the user pressed ‘ENTER’, then next address is displayed. This is continued until the user enters ‘q’.

**Examples**

To display or modify memory:

```
Address 0x1b07288, default width=1 byte:
fs0:\> mm 1b07288
MEM 0x000000000001B07288 : 0x6D >
MEM 0x000000000001B07289 : 0x6D >
MEM 0x000000000001B0728A : 0x61 > 80
MEM 0x000000000001B0728B : 0x70 > q
```

```
fs0:\> mm 1b07288
MEM 0x000000000001B07288 : 0x6D >
MEM 0x000000000001B07289 : 0x6D >
MEM 0x000000000001B0728A : 0x80 > *Modified
MEM 0x000000000001B0728B : 0x70 > q
```

To modify memory: Address 0x1b07288, width = 2 bytes:

```
Shell> mm 1b07288 -w 2
MEM 0x000000000001B07288 : 0x6D6D >
MEM 0x000000000001B0728A : 0x7061 > 55aa
MEM 0x000000000001B0728C : 0x358C > q
```

```
Shell> mm 1b07288 -w 2
MEM 0x000000000001B07288 : 0x6D6D >
MEM 0x000000000001B0728A : 0x55AA > *Modified
MEM 0x000000000001B0728C : 0x358C > q
```

To display IO space: Address 80h, width = 4 bytes:

```
Shell> mm 80 -w 4 -IO
IO 0x0000000000000080 : 0x000000FE >
IO 0x0000000000000084 : 0x00FFFE6D > q
```

To modify IO space using non-interactive mode:

```
Shell> mm 80 52 -w 1 -IO
Shell> mm 80 52 -w 1 -IO
IO 0x0000000000000080 : 0x52 > FE *Modified
IO 0x0000000000000081 : 0xFF >
IO 0x0000000000000082 : 0x00 >
IO 0x0000000000000083 : 0x00 >
IO 0x0000000000000084 : 0x6D >
IO 0x0000000000000085 : 0x5E >
IO 0x0000000000000086 : 0xFF >
IO 0x0000000000000087 : 0x00 > q
```

- To display PCI configuration space, ss=00, bb=00, dd=00, ff=00, rr=00:
Shell> mm 0000000000 -PCI
  PCI 0x0000000000000000 : 0x86 >
  PCI 0x0000000000000001 : 0x80 >
  PCI 0x0000000000000002 : 0x30 >
  PCI 0x0000000000000003 : 0x11 >
  PCI 0x0000000000000004 : 0x06 >
  PCI 0x0000000000000005 : 0x00 > q

These contents can also be displayed by 'PCI 00 00 00'.

To display PCIE configuration space, ss=00, bb=06, dd=00, ff=00, rrr=000:
Shell> mm 00060000000 -PCIE
  PCIE 0x0000000060000000 : 0xAB >
  PCIE 0x0000000060000001 : 0x11 >
  PCIE 0x0000000060000002 : 0x61 >
  PCIE 0x0000000060000003 : 0x43 >
  PCIE 0x0000000060000004 : 0x00 > q
mode

Summary
Displays or changes the console output device mode.

Usage
mode [col row]

Options
row
Number of rows

col
Number of columns

Description
This command is used to change the display mode for the console output device. When this command is used without any parameters, it shows the list of modes that the standard output device currently supports. The mode command can then be used with the row and col parameter to change the number of rows and columns on the standard output device. The following examples show how the mode command can be used. The first example lists all modes that are currently available, and the current selected mode is indicated by an '*'. The second example changes the mode to an 80 X 50 text mode display. The display is cleared every time the mode command is used to change the currently selected display mode.

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

Examples
To display all available modes on standard output:

Shell> mode
Available modes on standard output
  col  80 row  25 *
  col  80 row  50
  col  80 row  43
  col 100 row 100

To change the current mode setting:
Shell> mode 80 50
Available modes on standard output
  col  80 row  25
  col  80 row  50 *
  col  80 row  43
  col 100 row 100
mv

Summary
Moves one or more files to a destination within a file system.

Usage
mv src [src...] [dst]

Options
src
Source file/directory name (wildcards are permitted)

dst
Destination file/directory name (wildcards are permitted). If not specified, then the current working directory is assumed to be the destination. If there is more than one argument on the command line, the last one will always be considered the destination.

Description
This command moves one or more files to a destination within a file system. Moving between filesystem volumes is not supported. If the destination is an existing directory, then the sources are moved into that directory. Otherwise, the sources are moved to the destination, as if the directory has been renamed. If a destination is not specified, the current directory is assumed to be the destination.

Attempting to move a read-only file/directory will result in an error. Moving a directory that contains read-only files is allowed. You cannot move a directory into itself or its subdirectories. You cannot move a directory if the current working directory is itself or its subdirectories.

If an error occurs, the remaining files or directories will still be moved.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The source file was not able to be found</td>
</tr>
<tr>
<td>SHELL_OUT_OF_RESOURCES</td>
<td>There was insufficient free space to move the requested file to its destination.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_WRITE_PROTECTED</td>
<td>An attempt was made to create a file on media that was write-protected.</td>
</tr>
</tbody>
</table>
Examples

To rename a file:
```
fs0:\> mv IsaBus.efi Bus.efi
moving fs0:\IsaBus.efi -> \Bus.efi
- [ok]
```
openinfo

Summary
Displays the protocols and agents associated with a handle.

Usage
openinfo Handle [-b]

Options
Handle
Display open protocol information for specified handle

-b
Display one screen at a time

Description
This command is used to display the open protocols on a given handle. The example below is typical output from help for this command.

<table>
<thead>
<tr>
<th>Column Index</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Agent handle that opens the protocol</td>
</tr>
<tr>
<td>2</td>
<td>Controller handle that requires the protocol interface</td>
</tr>
<tr>
<td>3</td>
<td>Open count</td>
</tr>
<tr>
<td>4</td>
<td>Open type: HandProt, GetProt, TestProt, Child, Driver, Exclusive, DriverEx or Unknown</td>
</tr>
<tr>
<td>5</td>
<td>Name of image of the agent if available</td>
</tr>
</tbody>
</table>

Examples
To show open protocols on handle 0x23:
```shell
Shell> openinfo 23
Handle 23 (07DEE108)
  PciRootBridgeIo
    Drv[1D] Ctrl[23] Cnt(01) Driver Image(PciBus)
    Drv[1D] Ctrl[28] Cnt(01) Child Image(PciBus)
    Drv[1D] Ctrl[29] Cnt(01) Child Image(PciBus)
    Drv[00] Ctrl[ ] Cnt(01) HandProt
  dpath
    Drv[1D] Ctrl[23] Cnt(01) Driver Image(PciBus)
    Drv[00] Ctrl[ ] Cnt(0D) HandProt
```
parse

Summary
Command used to retrieve a value from a particular record which was output in a standard formatted output.

Usage
parse filename tablename column [-i <Instance>] [-s <Instance>]

Options
filename
Source file name
tablename
The name of the table being parsed.
column
The one-based column index to use to determine which value from a particular record to parse.
-i <Instance>
Start parsing with the nth instance of specified tablename, after the specified instance of ShellCommand. If not present, then all instances will be returned.
-s <Instance>
Start parsing with the nth instance of the ShellCommand table. If not present, then 1 is assumed.

Description
This command will enable the parsing of data from a file which contains data which has been output from a command having used the –sfo parameter. Since the standard formatted output has a well known means of parsing, this command is intended to be used as a simplified means of having scripts consume such constructed output files and use this retrieved data in logic of the scripts being written for the UEFI shell.

Examples
The following data is contained in a temporary file (temp.txt):

VolumeInfo, "MikesVolume","400000000","32000000","16000000"
FileInfo, "fs0:/efi/boot/winloader.efi","45670","arsh"
FileInfo, "fs0:/efi/boot/mikesfile.txt","1250","a"
FileInfo, "fs0:/efi/boot/readme.txt","795","a"

The following shows the parse command being used:
Below is an example using the Index parameter:

```
fs0:\> parse temp.txt FileInfo 3 -i 3
```

### Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The source file was not able to be found.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
</tbody>
</table>
pause

Usage

```
    pause [-q]
```

Description

The `pause` command prints a message to the display and then suspends script file execution and waits for keyboard input. Pressing any key resumes execution, except for `q` or `Q`. If `q` or `Q` is pressed, script processing terminates; otherwise execution continues with the next line after the pause command.

The `pause` command is available only in scripts. Switch `-q` can hide the message and it’s optional.

Examples

Following script is a sample of 'pause' command:
```
fs0:\> type pause.nsh
#  Example script for 'pause' command
# echo pause.nsh begin..
  date
  time
  pause
  echo pause.nsh done.
```

To execute the script with echo on:
```
fs0:\> pause.nsh
  +pause.nsh> echo pause.nsh begin..
  pause.nsh begin..
  +pause.nsh> date
  06/19/2001
  +pause.nsh> time
  00:51:45
  +pause.nsh> pause
  Enter 'q' to quit, any other key to continue:
  +pause.nsh> echo pause.nsh done.
  pause.nsh done.
```

To execute the script with echo off:
```
fs0:\> echo -off
fs0:\> pause.nsh
pause.nsh begin..
  06/19/2001
  00:51:45
  Enter 'q' to quit, any other key to continue: q
fs0:\>
```
\textbf{pci}

\textbf{Summary}
Displays PCI device list or PCI function configuration space.

\textbf{Usage}
\texttt{pci \{Bus Dev \{Func\} [-s Seg] [-i]\}}

\textbf{Options}
- \texttt{Bus}
  - Bus number
- \texttt{Dev}
  - Device number
- \texttt{Func}
  - Function number
- \texttt{-s}
  - Optional segment number \texttt{Seg} specified
- \texttt{-i}
  - Information interpreted

\textbf{Description}
This command will display all the PCI devices found in the system. And it can also display the configuration space of a PCI device according to the specified bus (\texttt{Bus}), device (\texttt{Dev}), and function (\texttt{Func}) addresses. If the function address is not specified, it will default to 0. The \texttt{-i} option is used to display verbose information for the specified PCI device. The PCI configuration space for the device will be dumped with a detailed interpretation.

If no parameters are specified all PCI devices will be listed. If the Bus and Device number parameters are specified while the Func or Seg parameters are not, Function or Seg will be set as default value 0.

The \texttt{-i} option can be used to display verbose information for the specified PCI device. The PCI configuration space for the specified device will be dumped with a detailed interpretation.

\textbf{Examples}
To display all PCI devices in the system:
Shell> PCI

<table>
<thead>
<tr>
<th>Seg</th>
<th>Bus</th>
<th>Dev</th>
<th>Func</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>00</td>
<td>00</td>
<td>00</td>
<td>00</td>
<td>Bridge Device - Host/PCI bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 1130 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>01</td>
<td>00</td>
<td>Bridge Device - PCI/PCI bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 1131 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>1E</td>
<td>00</td>
<td>Bridge Device - PCI/PCI bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 2448 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>1F</td>
<td>00</td>
<td>Bridge Device - PCI/ISA bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 2440 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>1F</td>
<td>01</td>
<td>Mass Storage Controller - IDE controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 244F Prog Interface 80</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>1F</td>
<td>02</td>
<td>Serial Bus Controllers - USB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 2442 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>1F</td>
<td>03</td>
<td>Serial Bus Controllers - System Management Bus</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 2443 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>1F</td>
<td>04</td>
<td>Serial Bus Controllers - USB</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 2444 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>1F</td>
<td>05</td>
<td>Multimedia Device - Audio device</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 2445 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>00</td>
<td>1F</td>
<td>06</td>
<td>Simple Communications Controllers - Modem</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 8086 Device 2446 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>01</td>
<td>00</td>
<td>00</td>
<td>Display Controller - VGA/8514 controller</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 1002 Device 5246 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>02</td>
<td>07</td>
<td>00</td>
<td>Multimedia Device - Audio device</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 1274 Device 1371 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>02</td>
<td>0A</td>
<td>00</td>
<td>Bridge Device - CardBus bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 1180 Device 0476 Prog Interface 0</td>
</tr>
<tr>
<td>00</td>
<td>02</td>
<td>0A</td>
<td>01</td>
<td>Bridge Device - CardBus bridge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Vendor 1180 Device 0476 Prog Interface 0</td>
</tr>
</tbody>
</table>

To display the configuration space of Bus 0, Device 0, Function 0:
PCI Segment 00 Bus 00 Device 00 Func 00

Vendor ID(0): 8086                     Device ID(2): 1130

Command(4): 0006
 (00) I/O space access enabled: 0 (01) Memory space access enabled: 1
 (02) Behave as bus master: 1 (03) Monitor special cycle enabled: 0
 (04) Mem Write & Invalidate enabled: 0 (05) Palette snooping is enabled: 0
 (06) Assert PERR# when parity error: 0 (07) Do address/data stepping: 0
 (08) SERR# driver enabled: 0 (09) Fast back-to-back transact...: 0

Status(6): 2090
 (04) New Capabilities linked list: 1 (05) 66MHz Capable: 0
 (07) Fast Back-to-Back Capable: 1 (08) Master Data Parity Error: 0
 (09) DEVSEL timing: Fast (11) Signaled Target Abort: 0
 (12) Received Target Abort: 0 (13) Received Master Abort: 1
 (14) Signaled System Error: 0 (15) Detected Parity Error: 0

Revision ID(8): 02 BIST(0F): Incapable
Cache Line Size(C): 00 Latency Timer(D): 00
Header Type(0E): 0, Single function, PCI device
Class: Bridge Device - Host/PCI bridge - Base Address Registers(10):
Start  Type    Space     Prefetchable?      Size       Limit
----------------------------------------------------------------
20000000 Mem     32 bits YES             04000000    24000000
----------------------------------------------------------------
No Expansion ROM(30)
Cardbus CIS ptr(2B):  00000000
Sub VendorID(2C):     0000 Subsystem ID(2E):  0000
Capabilities Ptr(34): 88
Interrupt Line(3C):   00 Interrupt Pin(3D):  00
Min_Gnt(3E):          00 Max_Lat(3F):       00

To display configuration space of Segment 0, Bus 0, Device 0, Function 0:
Shell> PCI 00 00 00 00 -s 0

PCI Segment 00 Bus 00 Device 00 Func 00
00000000: 86 80 30 11 06 00 90 20-02 00 00 06 00 00 00 00  *...0....
........*
00000010: 08 00 00 20 00 00 00 00-00 00 00 00 00 00 00 00  *...0....
........*
00000020: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
00000030: 00 00 00 00 88 00 00 00-00 00 00 00 00 00 00 00  *...
........*
00000040: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
00000050: 50 00 09 38 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
00000060: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
00000070: 00 00 18 00 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
00000080: DE A8 C0 00 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
00000090: 00 00 D6 FF FF FF 00 00-33 80 33 80 85 84 C4 00  *...
........1.3....
000000A0: 02 00 20 00 07 02 00 1F-00 00 00 00 00 00 00 00  *...
........*
000000B0: 00 00 00 00 30 00 00 00-00 00 00 00 00 00 00 00  *...
......O........
000000C0: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
000000D0: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
000000E0: 00 00 00 00 00 00 00 00-00 00 00 00 00 00 00 00  *...
........*
000000F0: 00 00 00 00 74 F8 00 00-00 00 00 00 00 00 08 00 00 00  *...
....t........
ping

Summary
Ping the target host with IPv4 stack.

Usage
Ping [-n count] [-l size] TargetIp

Options
-\nNumber of echo request datagram to be sent.
-\l
Size of data buffer in echo request datagram.
TargetIp
IPv4 address of the target machine.

Description
This command uses the ICMPv4 ECHO_REQUEST datagram to elicit ECHO_REPLY from a host.

Examples
To ping the target host with 64 bytes data:
Shell: \> ping -l 64 192.168.0.1

To ping the target host by sending 20 echo request datagram:
Shell: \> ping -n 20 202.120.100.1

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>
reconnect

Summary
Reconnects drivers to the specific device.

Usage
reconnect DeviceHandle [DriverHandle [ChildHandle]]
reconnect -r

Options

DeviceHandle
Device handle (a hexadecimal number)

DriverHandle
Driver handle (a hexadecimal number). If not specified, all drivers on the
specified device will be reconnected.

ChildHandle
Child handle of device (a hexadecimal number). If not specified, then all child
handles of the specified device will be reconnected.

-r
Reconnect drivers to all devices.

Description
This command reconnects drivers to the specific device. It will first disconnect the
specified driver from the specified device and then connect the driver to the device
recursively.

If the -r option is used, then all drivers will be reconnected to all devices. Any drivers
that are bound to any devices will be disconnected first and then connected
recursively. See the connect and disconnect commands for more details.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

Examples

To reconnect all drivers to all devices:

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Shell> reconnect -r

To reconnect all drivers to device 0x28:
   fs0:\> reconnect 28

To disconnect 0x17 from 0x28 then reconnect drivers with 0x17 as highest priority to
device 0x28:
   fs0:\> reconnect 28 17

To disconnect 0x17 from 0x28 destroying child 0x32 then reconnect drivers with 0x17
as highest priority to device 0x28
   fs0:\> reconnect 28 17 32
reset

Summary

Resets the system.

Usage

reset [-w [string]]
reset [-s [string]]
reset [-c [string]]

Options

-s        - Performs a shutdown
-w        - Performs a warm boot
-c        - Performs a cold boot
string    - String to be passed to reset service

Description

This command resets the system. The default is to perform a cold reset unless the -w parameter is specified. If the reset string is specified, then it is passed into the Reset() function, so the system can know the reason for the system reset.

Status Codes Returned

| SHELL_INVALID_PARAMETER | One of the passed in parameters was incorrectly formatted or its value was out of bounds. |
**rm**

**Summary**

Deletes one or more files or directories.

**Usage**

```bash
rm [-q] file/directory [file/directory ...]
```

**Options**

- `-q`
  - Quiet mode; does not prompt user for a confirmation

- `file`
  - File name (wildcards are permitted)

- `directory`
  - Directory name (wildcards are permitted)

**Description**

This command deletes one or more files or directories. If the target is a directory, it will delete the directory, including all its subdirectories. It is not allowed to redirect a file whose parent directory (or the file itself) is being deleted.

Removing a read-only file/directory will result in a failure. Removing a directory containing read-only file(s) will result in a failure. If an error occurs, `rm` will exit immediately and later files/directories will not be removed.

You cannot remove a directory when the current directory is itself or its subdirectory. If file contains wildcards, it will not ask user for confirmation.

You cannot remove the root directory. You cannot remove the current directory or its ancestor.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The target file or directory was not able to be found</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_WRITE_PROTECTED</td>
<td>The target media was write-protected.</td>
</tr>
</tbody>
</table>

**Examples**

To remove multiple directories at a time:
fs0:\> ls test
Directory of: fs0:\test
    06/18/01  01:01p <DIR>            512  .
    06/18/01  01:01p <DIR>              0  ..
    06/19/01  12:59a <DIR>            512  temp1
    06/19/01  12:59a <DIR>            512  temp2
    0 File(s)           0 bytes
    4 Dir(s)

Error occurs and RM will exit:
fs0:\> rm test\temp11 temp2
rm/del: Cannot find 'fs0:\test\temp11' - Not Found

To remove multiple directories with wildcards:
fs0:\> rm test\temp*
rm/del: Remove subtree 'fs0:\test\temp1' [y/n]? y
removing fs0:\test\temp1\templ.txt  - [ok]
removing fs0:\test\temp1\boot\nshell.efi  - [ok]
removing fs0:\test\temp1\boot          - [ok]
removing fs0:\test\temp1              - [ok]
rm/del: Remove subtree 'fs0:\test\temp2' [y/n]? y
removing fs0:\test\temp2\temp2.txt    - [ok]
removing fs0:\test\temp2              - [ok]

Removing a directory that contains a read-only file will fail:
fs0:\> attrib +r test\temp1\readme.txt
A  R fs0:\test\temp1\readme.txt
fs0:\> rm test\temp1
rm/del: Cannot open 'readme.txt' under 'fs0:\test\temp1' in writable mode
- [error] - Access Denied
Exit status code: Access Denied
sermode

Summary

Sets serial port attributes.

Usage

sermode [handle [baudrate parity databits stopbits]]

Options

handle

Device handle for a serial port in hexadecimal. The dh command can be used to retrieve the right handle.

baudrate

Baud rate for specified serial port. The following values are supported: 50, 75, 110, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600 (default), 19200, 38400, 57600, 115200, 230400, and 460800. All other values will be converted to the next highest setting.

parity

Parity bit settings for specified serial port. Any one of the following:

d - Default parity

n - No parity

e - Even parity

o - Odd parity

m - Mark parity

s - Space parity

data bits

Data bits for the specified serial port. The following settings are supported: 4, 7, 8 (default). All other settings are invalid.

stopbits

Stop bits for the specified serial port. The following settings are supported:

0 (0 stop bits - default setting)

1 (1 stop bit)

2 (2 stop bits)

15 (1.5 stop bits)

Note: All other settings are invalid.
Description

This command displays or sets baud rate, parity attribute, data bits and stop bits of serial ports. If no attributes are specified, then the current settings are displayed. If no handle is specified, then all serial ports are displayed.

Examples

To display the settings for all serial port devices:
```
Shell> sermode
4F06B08 - (115200, N, 8, 1)
4F05F88 - (115200, N, 8, 1)
```

To display the settings for the serial port device whose handle is 0x6B:
```
Shell> sermode 6B
4F06B08 - (115200, N, 8, 1)
```

To configure the serial port settings for handle 0x6B to 9600bps, even parity, 8 data bits, and 1 stop bit:
```
Shell> sermode 6B 9600 e 8 1
sermode: Mode set on handle 04F06B08
set

Summary
Displays, changes or deletes a UEFI Shell environment variables.

Usage
```bash
set [-v] [sname [value]]
set [-d <sname>]
```

Options
- `-d`
  Deletes the environment variable
- `-v`
  Volatile variable

`sname`
Environment variable name

`value`
Environment variable value

Description
This command is used to maintain the UEFI Shell environment variables. This command can do the following:
- Display the environment variables.
- Create new environment variables.
- Change the value of existing environment variables.
- Delete environment variables.

The `set` command will set the environment variable that is specified by `sname` to `value`. This command can be used to create a new environment variable or to modify an existing environment variable.

If the `set` command is used without any parameters, then all the environment variables are displayed. If the `set` command is used with the `-d` option, then the environment variable that is specified by `sname` will be deleted.

**Note:** This command does not change the value of the environment variable `lasterror`.

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
</tbody>
</table>

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A request to set a variable in a non-volatile fashion could not be completed. The resulting non-volatile request has been converted into a volatile request.

Examples

To add an environment variable:

Shell> set DiagnosticPath fs0:\efi\diag;fs1:\efi\diag

To display environment variables:

Shell> set
* path           : .
    diagnosticPath : fs0:\efi.1\diag;fs1:\efi.1\diag

To delete an environment variable:

Shell> set -d diagnosticpath
Shell> set
* path           : .

To change an environment variable:

fs0:\> set src efi
fs0:\> set
* path    : .;fs0:\efi\tools;fs0:\efi\boot;fs0:\
    src    : efi
fs0:\> set src efi1.1
fs0:\> set
* path    : .;fs0:\efi\tools;fs0:\efi\boot;fs0:\
    src    : efi1.1

To append an environment variable:

Shell> set
* path      : .
Shell> set path %path%;fs0:\efi\tools;fs0:\efi\boot;fs0:\
Shell> set
* path      : .;fs0:\efi\tools;fs0:\efi\boot;fs0:\

To set a volatile variable that will disappear at the next boot:

Shell> set -v EFI_SOURCE c:\project\EFI1.1
Shell> set
* path      : .;fs0:\efi\tools;fs0:\efi\boot;fs0:\
* EFI_SOURCE : c:\project\EFI1.1
setsize

Summary

Adjusts the size of a file.

Usage

```
setsize size file [file...]
```

Options

- **file**
  - The file or files which will have its size adjusted.

- **size**
  - The desired size of the file once it is adjusted. Setting the size smaller than the actual data contained in this file will truncate this data.

Description

This command adjusts the size of a particular target file. When adjusting the size of a file, it should be noted that it will automatically truncate or extend the size of a file based on the passed in parameters. If the file does not exist, it will be created.

Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_VOLUME_FULL</td>
<td>The media has insufficient space to complete the request.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>
setvar

Summary
Changes the value of a UEFI variable.

Usage
setvar variable-name [-guid guid] [-bs] [-rs] [-nv] [=data]

Options
variable-name
The name of the UEFI variable to modify or display.

-guid
Specifies the GUID of the UEFI variable to modify or display. If not present, then the GUID EFI_GLOBAL_VARIABLE, as defined in chapter 3.2 of the UEFI specification.

-bs
Indicates that the variable is a boot variable. Should only be present for new variables, otherwise it is ignored.

-rs
Indicates that the variable is a runtime variable. Should only be present for new variables, otherwise it is ignored.

-nv
Indicates that the variable is non-volatile. If not present, then the variable is assumed to be volatile. Should only be present for new variables, otherwise it is ignored.

=data
New data for the variable. If there is nothing after the '=' then the variable is deleted. If '=' is not present, then the current value of the variable is dumped as hex bytes. The data may consist of zero or more of the following:
xx[xx]:
Hexadecimal bytes
"ascii-string":
ASCII-string with no null-terminator
L"UCS2-string":
UCS-2 encoded string with no null-terminator
--device
Device path text format, as specified by the EFI Device Path Display Format Overview section of the UEFI 2.1 specification.
Description

This command changes the UEFI variable specified by name and guid. If = is specified, but data is not, the variable is deleted, if it exists. If = is not specified, then the current variable contents are displayed. If =data is specified, then the variable’s value is changed to the value specified by data.

-\texttt{bs}, -\texttt{rt} and -\texttt{nv} are only useful if the variable already exists. If the variable already exists and the attributes cannot be changed, then -1 is returned.
**shift**

**Usage**

`shift`

**Description**

The `shift` command shifts the contents of a UEFI Shell script’s positional parameters so that %1 is discarded, %2 is copied to %1, %3 is copied to %2, %4 is copied to %3 and so on. This allows UEFI Shell scripts to process script parameters from left to right.

*Note:* This command does not change the UEFI shell environment variable `lasterror`.

*Note:* The `shift` command is available only in UEFI Shell scripts.

**Examples**

Following script is a sample of ‘shift’ command:

```
fs0:\> type shift.nsh
#
# Example script for 'shift' command
#
echo %1 %2 %3
shift
echo %1 %2
```

To execute the script with echo on:

```
fs0:\> shift.nsh welcome EFI world
shift.nsh> echo welcome EFI world
welcome EFI world
shift
echo EFI world
EFI world
```

To execute the script with echo off:

```
fs0:\> echo -off
fs0:\> shift.nsh welcome EFI world
welcome EFI world
EFI world
```

Version 2.0
smbiosview

Summary
Displays SMBIOS information.

Usage
smbiosview [-t SmbiosType] [-h SmbiosHandle] [-s] [-a]

Options
-t
Display all structures of SmbiosType. The following values are supported:
0 - BIOS Information
1 - System Information
3 - System Enclosure
4 - Processor Information
5 - Memory Controller Information
6 - Memory Module Information
7 - Cache Information
8 - Port Connector Information
9 - System Slots
10 - On Board Devices Information
15 - System Event Log
16 - Physical Memory Array
17 - Memory Device
18 - 32-bit Memory Error Information
19 - Memory Array Mapped Address
20 - Memory Device Mapped Address
21 - Built-in Pointing Device
22 - Portable Battery
34 - Management Device
37 - Memory Channel
38 - IPMI Device Information
39 - System Power Supply
-h
Display the structure of SmbiosHandle, the unique 16-bit value assigned to each SMBIOS structure. SmbiosHandle can be specified in either decimal or hexadecimal format. Use the 0x prefix for hexadecimal values.
-s
Display statistics table.
-a
Display all information.

Description
This command displays the SMBIOS information. Users can display the information of SMBIOS structures specified by type or handle.
**stall**

**Summary**

Stalls the operation for a specified number of microseconds.

**Usage**

`stall time`

**Options**

- `time`
  The number of microseconds for the processor to stall.

**Description**

This command would be used to establish a timed stall of operations during a script.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_DEVICE_ERROR</td>
<td>There was a hardware error associated with this request.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>
time

Summary
Displays or sets the current time for the system.

Usage
``time [hh:mm:ss] [-tz tz] [-d dl]
``

Options
``
   hh  New hour (0-23) (required)
   mm  New minute (0-59) (required)
   ss  New second (0-59) If not specified, then zero will be used.
   -tz Timezone adjustment, measured in minutes offset from GMT. Valid values can be between -1440 and 1440 or 2047. If not present or set to 2047, time is interpreted as local time.
   -d  Indicates that time is not affected by daylight savings time (0), time is affected by daylight savings time but time has not been adjusted (1), or time is affected by daylight savings time and has been adjusted (3). All other values are invalid. If no value follows -d, then the current daylight savings time will be displayed.
``

Description
This command displays or sets the current time for the system. If no parameters are used, it shows the current time. If valid hours, minutes, and seconds are provided, then the system's time will be updated.

Note the following rules:

Except for numeric characters and the : character, all other characters in the argument are invalid. The Shell will report an error if the number is in the wrong hour/minute/second range.

Spaces before or after the numeric character are not allowed. Spaces inserted into the number are not allowed either.

Repeated zeros are allowed before the number. For example:
The seconds parameter is optional. If there is no seconds number, it will set to zero by default.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_DEVICE_ERROR</td>
<td>There was a hardware error preventing the completion of this command</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>

**Examples**

Shell > time 17:23
Shell > time 17:23:00 (GMT+08:00)
Shell > time 17:23:
Shell > time 17:23:00 (GMT+08:00)

To display current time:

fs0:\> time
16:51:03 (GMT+08:00)

To set the system time:

fs0:\> time 9:51:30
fs0:\> time
09:51:31 (GMT+08:00)

To get the time, including daylight savings time:

fs0:\> time 9:51:30
fs0:\> time -d
09:51:31 (GMT+08:00) DST: Not Affected
timezone

Summary
Displays or sets time zone information.

Usage
timezone [-s hh:mm | -l] [-b] [-f]

Options
- **-s**  
  Set time zone associated with \texttt{hh:mm} offset from GMT
- **-l**  
  Display list of all time zones
- **-b**  
  Display one screen at a time
- **-f**  
  Display full information for specified timezone

Description
This command displays and sets the current time zone for the system. If no parameters are used, it shows the current time zone. If a valid \texttt{hh:mm} parameter is provided, then the system's time zone information will be updated.

Examples
To display all available time zones:
Shell> timezone -l
GMT-12:00, International Date Line West
GMT-11:00, Midway Island, Samoa
GMT-10:00, Hawaii
GMT-09:00, Alaska
GMT-08:00, Pacific Time (US & Canada); Tijuana
GMT-07:00, Arizona, Chihuahua, La Paz, Mazatlan
GMT-06:00, Central America, Central Time (US & Canada)
GMT-05:00, Bogota, Lima, Quito, Eastern Time (US & Canada)
GMT-04:00, Atlantic Time (Canada), Caracas, Santiago
GMT-03:30, Newfoundland
GMT-03:00, Brasilia, Buenos Aires, Georgetown, Greenland
GMT-02:00, Mid-Atlantic
GMT-01:00, Azores, Cape Verde Is.
GMT, Greenwich Mean Time, Casablanca, Monrovia, Dublin, London
GMT+01:00, Amsterdam, Berlin, Bern, Rome, Paris, West Central Africa
GMT+02:00, Athens, Istanbul, Bucharest, Cairo, Jerusalem
GMT+03:00, Baghdad, Kuwait, Riyadh, Moscow, Nairobi
GMT+03:30, Tehran
GMT+04:00, Abu Dhabi, Muscat, Baku, Tbilisi, Yerevan
GMT+04:30, Kabul
GMT+05:00,Ekaterinburg, Islamabad, Karachi, Tashkent
GMT+05:30, Chennai, Kolkata, Mumbai, New Delhi
GMT+05:45, Kathmandu
GMT+06:00, Almaty, Novosibirsk, Astana, Dhaka, Sri Jayawardenepura
GMT+06:30, Rangoon
GMT+07:00, Bangkok, Hanoi, Jakarta, Krasnoyarsk
GMT+08:00, Beijing, Chongqing, Hong Kong, Urumqi, Taipei, Perth
GMT+09:00, Osaka, Sapporo, Tokyo, Seoul, Yakutsk
GMT+09:30, Adelaide, Darwin
GMT+10:00, Canberra, Melbourne, Sydney, Guam, Hobart, Vladivostok
GMT+11:00, Magadan, Solomon Is., New Caledonia
GMT+12:00, Auckland, Wellington, Fiji, Kamchatka, Marshall Is.
GMT+13:00, Nuku'alofa

To set the time zone:
Shell> timezone -s -7:00
Shell> timezone
GMT-07:00
Shell> timezone -s 5:00
Shell> timezone
GMT+05:00

To display detailed information for the current time zone:
Shell> timezone -f
GMT+05:00, Ekaterinburg, Islamabad, Karachi, Tashkent
Shell> timezone
GMT+05:00
touch

**Summary**

Updates the time and date on a file to the current time and date.

**Usage**

```
touch [-r] file [file ...]
```

**Options**

- `file`
  - The name or pattern of the file or directory. There can be multiple files on the command-line.
- `-r`
  - Recurse into subdirectories

**Description**

This command updates the time and date on the file that is specified by the `file` parameter to the current time and date.

If multiple files are specified on the command line, it will continue processing. It will touch the files one by one and errors will be ignored.

Touch cannot change the time and date of read-only files and directories.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The target file or set of files were not found.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_WRITE_PROTECTED</td>
<td>The media was write-protected or the file had a read-only attribute associated with it.</td>
</tr>
</tbody>
</table>
type

Summary
Sends the contents of a file to the standard output device.

Usage
`type [-a|-u] file [file...]`

Options
`file`
Name of the file to display.

`-a`
Display the file as if it is encoded as 8-bit ASCII

`-u`
Displays the file as if it were encoded as UCS-2 Unicode.

Description
This command sends the contents of a file to the standard output device. If no options are used, then the command attempts to automatically detect the file type. If it fails, then UCS-2 is presumed.

If the `-a` option is specified, the file is sent to the standard output device as a stream of ASCII characters.

If the `-u` option is specified, the file is sent to the standard output device as a stream of Unicode (UCS-2) characters.

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The target file or set of files were not found.</td>
</tr>
</tbody>
</table>

Examples
To display a file in UCS-2 format:
fs0:\> type -u pause.nsh
#
# Example script for 'pause' command
#
echo pause.nsh begin..
date
time
pause
echo pause.nsh done.

To display multiple files:
fs0:\> type test.*
How to Install?
time
stall 3000000
time
unload

Summary
Unloads a driver image that was already loaded.

Usage
unload [-n] [-v|verbose] Handle

Options
- **-n**
  Skips all prompts during unloading, so that it can be used in a script file.
- **-v, -verbose**
  Dump verbose status information before the image is unloaded.

Handle
Handle of driver to unload, always taken as hexadecimal number

Description
This command unloads a driver image that was already loaded and which supports the unloading option (see **EFI_LOADED_IMAGE_PROTOCOL**'s `Unload()` member.)

Status Codes Returned

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
</tbody>
</table>
**ver**

**Summary**

Displays the version information for the UEFI Shell and the underlying UEFI firmware.

**Usage**

`ver [-s| -terse]`

**Options**

- `-s`
  
  Displays only the UEFI Shell version

- `-terse`

**Description**

This command displays the version information for this EFI Firmware or the version information for the UEFI Shell itself. The information is retrieved through the EFI System Table or the Shell image.

```
UEFI <support-level> Shell v<uefi-shell-version>
shell-supplier-specific-data
UEFI v<uefi-firmware-version> (<firmware vendor name>, 0x<firmware vendor version as 32-bit hex value> <optional additional vendor version>)
```

UEFI Basic Shell v2.0
Build 8192. Copyright 2008 by Intel(R) Corporation.
UEFI v2.10 Firmware (Phoenix Technologies Ltd., 0x01014318)

- `<support-level>`
  
  0 = Minimal, 1 = Scripting, 2 = Basic, 3 = Interactive

- `<uefi-shell-version>`
  
  comes from the shell spec upon which the shell implementation is based.

- `<shell-supplier-specific-data>`
  
  Build, copyright, etc.

- `<uefi-firmware-version>`
  
  From the EFI System Table's Hdr.Revision field, formatted as two period delimited fields. The first field is the upper 16-bits of this field, represented as a decimal unsigned integer. The second field is the lower 16-bites of this field, represented as a two-digit, zero-filled decimal unsigned integer.

- `<firmware vendor name>`
  
  From the EFI System Table's FirmwareVendor field

Version 2.0
<firmware vendor version>
From the EFI System Table's FirmwareRevision field

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
</tbody>
</table>
**vol**

**Summary**
Displays the volume information for the file system that is specified by *fs*.

**Usage**

```
vol [fs] [-n <VolumeLabel>]
vol [fs] [-d]
```

**Options**

*fs*
The name of the file system.

*VolumeLabel*
The name of the file system. The following characters cannot be used: % ^ * + = [ ] | : ; " < > ? / . No spaces are allowed in the volume label.

*-d*
Empty volume label.

**Description**

This command displays the volume information for the file system that is specified by *fs*. If *fs* is not specified, the current file system will be used. If -n is specified, then the volume label for *fs* will be set to *VolumeLabel*. The maximum length for *VolumeLabel* is 11 characters.

**Status Codes Returned**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>The action was completed as requested.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>One of the passed in parameters was incorrectly formatted or its value was out of bounds.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>This function was not performed due to a security violation</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>The target file-system was not found</td>
</tr>
</tbody>
</table>

**Examples**

To display the volume of the current fs:
```
fs0:\> vol
Volume has no label (rw)
1,457,664 bytes total disk space
1,149,440 bytes available on disk
512 bytes in each allocation unit
```

To change the label of fs0:
shell> vol fs0 -n help_test
Volume HELP_TEST (rw)
1,457,664 bytes total disk space
1,149,440 bytes available on disk
512 bytes in each allocation unit

To get rid of the label of fs0:
fs0:\> vol fs0 -d
Volume has no label (rw)
1,457,664 bytes total disk space
220,160 bytes available on disk
512 bytes in each allocation unit
Appendix A
UEFI Shell Consistent Mapping Design

This appendix describes how device assignments are created.

A.1 Requirement:

1. The shell shall support consistent device assignments across (through) reboots.
   e.g. same concept as how you assign the letter D: to a partition under DOS/Windows.

2. The shell commands shall support defining mappings.
   For identical machines with the same hardware configurations the mapping result should always be the same.

3. Not use the NV storage.
   In the OS, it is easy to implement the consistent mapping, because it can store the mapping info on the hard disk or other storage. The firmware has no large storage to store all of this system info. To save space, it is strongly desired that such mapping data does not use NV storage to maintain this data.

A.2 Design

A.2.1 What does consistent mapping mean?

If hardware configuration is not changed, the mappings should not change. EXAMPLE: map -r, reboot, map -r will not change the mappings.

If two or more machines have the same hardware configurations, mapping result should be the same.

A.2.2 Hardware configuration change:

Generally, buses, controllers, hubs or bridges changing mean hardware configuration change.
The change of the number or physical connection of hardware which can have child hardware devices will be considered as hardware configuration change.

**Example:**

**A.2.2.1 Hardware configuration change example**

1. Change IDE disk from IDE primary master to slave
2. Change USB device from port0 to port1
3. Add or remove a SCSI controller adapt card

**A.2.2.2 Hardware configuration not change example**

1. Remove floppy/cdrom disk in drive will not affect mapped names of other existing names
2. Remove floppy/cdrom, then insert back, the newly mapped name will be the same as the last time it was mapped.
3. Unplugging a usb device will not affect mapped names of other existing names
4. Unplug usb device, then plug back to the same port, the newly mapped will be the same as the last time it was mapped.

**A.2.3 Mapping generated from device path**

The device path is used to generate the mapping, because in a platform, the device path is unique and if the hardware configuration doesn’t change, the device’s device path doesn’t change.

**A.2.4 Consistent Mapping**

A consistent mapping consists of 3 parts:

<MDD><HI><CSD>

MTD(Media Type Descriptor): A string carries device’s media info (harddisk, CD-ROM, ...etc.)

1. Auxiliary name of media type, determined by device path
2. Matches with EFI device path specification
3. Proposed name (hd for harddisk, cd for CD-ROM, fp for floppy, etc.)

HI(Hardware Index): The index of the hardware device path node described in current device path. The index is determined by the position of the whole sorted hardware device path node in system.

1. Extract the hardware device path node and ACPI device path node from each device path in system, make a condensed device path.
2. Use certain algorithm to sort all the condensed device paths

3. Adding/Removing controller(s) would change the index (hardware configuration change)

CSD (Connection Specific Descriptor): A string of numbers and characters, which identifies how the device connects to parent controller.

1. Specify the connection of device
2. Use one or several numbers or characters to describe each media and messaging device path node in device path to specify the connection

A.2.5

Example (USB Devices)

Hardware Configuration (USB part)

4 UHC

7 USB devices: 4 Hard disks, 3 hub

Other hardware are ignored when mapping usb subsystem

Device Path (controllers are underlined)

acpi(pnp0a03,0)/pci(1d,0)/usb(0,1)/usb(1,1)/HD(Part4, sigxxx)
acpi(pnp0a03,0)/pci(1d,3)/usb(0,1)/usb(5,1)/HD(Part2, sigxxx)
acpi(pnp0a03,0)/pci(1d,1)/usb(1,0)/HD(Part3, sigxxx)
acpi(pnp0a03,0)/pci(1d,2)/usb(1,0)/usb(2,0)/HD(Part1, sigxxx)

Steps to determine the consistent mapping for devices:

1. Determine the MTD
2. Determine the HI
3. Determine the CSD
4. Make the final mapping

A.2.5.1 Step 1: Determine MTD

MTD for all devices:

- hd is defined for harddisk.
- cd is defined for CD-ROM.
- fp is defined for floppy.
- f is defined for unknown device.

... More names will be added according to the evolution of UEFI specification

Version 2.0
The 4 USB devices are the hard disks, so their MTDs are "hd".

### A.2.5.2 Step 2: Determine HI

HI is determined by ACPI device path node and hardware device path node

1. **Algorithm to calculate the HI**

2. **Enumerate all device path exist in system, whether there is a file system on it or not.**

3. **Split the device path: the hardware and ACPI device path node part consists of the HI device path that generates the HI and the remain device path consist the CSD device path which generate the CSD.**

Each kind of device path node has its own compare algorithm.

For acpi device path node, the compare algorithm is:

\[
\text{acpi}(h_1, u_1) > \text{acpi}(h_2, u_2) \text{ only if } h_1 > h_2 \text{ or } (h_1 = h_2 \text{ and } u_1 > u_2)
\]

For pci device path node, the compare algorithm is:

\[
\text{pci}(d_1, f_1) > \text{pci}(d_2, f_2) \text{ only if } d_1 > d_2 \text{ or } (d_1 = d_2 \text{ and } f_1 > f_2)
\]

For example:

\[
\text{acpi(pnp0a03,0)/pci(1d|0)} < \text{acpi(pnp0a03,0)/pci(1d|1)} < \ldots < \text{acpi(pnp0a03,0)/pci(1d|3)}
\]

Use decimal number for HI (0, 1, 2, 3, ...)

After sorting we can assign HI for each hardware device path node part:
A.2.5.3 Step 3: Determine CSD

For each kind device path node, there are rules to translate the device path node to the CSD.

A.2.5.3.1 Rules for USB device path node

Use interface number and port number for usb node

Numbers in device path will be mapped at intervals to characters or numbers

When mapping from numbers to characters: use a − 0 , b − 1 , ..., z − 25

Sample:
usb(0,1) → a1 or 0b.

A.2.5.3.2 Rules for hard drive device path node

Use partition number for hard drive device node

Sample:
 HD(Part4, sigxxx) → e or 4.

The CSD device paths of the 4 harddisk in our sample are:
usb(0,1)/usb(1,1)/HD(Part4, sigxxx)
usb(0,1)/usb(5,1)/HD(Part2, sigxxx)
usb(1,0)/HD(Part3, sigxxx)
usb(1,0)/usb(2,0)/HD(Part1, sigxxx)

A.2.5.3.3 Corresponding CSDs

usb(0,1)/usb(1,1)/HD(Part4, sigxxx) → a1b1e
usb(0,1)/usb(5,1)/HD(Part2, sigxxx) → a1c1e
usb(1,0)/HD(Part3, sigxxx) → b0d
usb(1,0)/usb(2,0)/HD(Part1, sigxxx) → b0c0b

A.2.5.3.4 Step 4: Make the whole mapping

Whole mapping rule:
<USB mapping> ::= <[MTD]> <HI> <CSD>
<MTD> ::= {hd, fp, cd...}
<HI> ::= {0, 1, 2, ...}
<CSD> ::=<node sequence>

Put the three parts (MTD, HI and CSD) together to get final mapping for the four hard disks
A.3

Implementation

Consistent Mapping = <MTD><HI><CSD>

MTD

<table>
<thead>
<tr>
<th>fp</th>
<th>floppy</th>
</tr>
</thead>
<tbody>
<tr>
<td>hd</td>
<td>hard disk</td>
</tr>
<tr>
<td>cd</td>
<td>cd rom</td>
</tr>
<tr>
<td>f</td>
<td>unknown media</td>
</tr>
</tbody>
</table>

HI

1. Extract the hardware device path node and ACPI device path node from each device path in system,

2. Extract the condensed HI device path

3. Sort the extracted HI device paths.

HI is index of the sorted HI device paths.

CSD

Use one or several numbers or characters to describe each media and messaging device path node in device path to specify the connection.

All of the reference values in the table below are references to the device path type and sub-type values in the UEFI specification. For actual values of each of the corresponding Type and Sub-type values, please refer to the UEFI spec.

<table>
<thead>
<tr>
<th>Type</th>
<th>Sub Type</th>
<th>Node Type</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>HARDWARE_DEVICE</td>
<td>HW_PCI</td>
<td>HI Node</td>
<td>Used to get HI</td>
</tr>
<tr>
<td>HARDWARE_DEVICE</td>
<td>HW_PCCARD</td>
<td>HI Node</td>
<td>Used to get HI</td>
</tr>
<tr>
<td>HARDWARE_DEVICE</td>
<td>HW_MEMMAP</td>
<td>HI Node</td>
<td>Used to get HI</td>
</tr>
<tr>
<td>HARDWARE_DEVICE</td>
<td>HW_VENDOR</td>
<td>HI Node</td>
<td>Used to get HI</td>
</tr>
<tr>
<td>HARDWARE_DEVICE</td>
<td>HW_CONTROLLER</td>
<td>HI Node</td>
<td>Used to get HI</td>
</tr>
<tr>
<td>ACPI_DEVICE</td>
<td>ACPI</td>
<td>HI/CSD Node</td>
<td>Used ACPI(0604) to get HI and other to get CSD.</td>
</tr>
</tbody>
</table>

Formatted: Bullets and Numbering
<table>
<thead>
<tr>
<th>MESSAGING_DEVICE</th>
<th>MSG_ATAPI</th>
<th>CSD Node</th>
<th>IDE channel index (0 for primary, master, 3 for secondary slave)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_SCSI</td>
<td>CSD Node</td>
<td>Use LUN number and PUN number for SCSI node</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_FIBRECHANNEL</td>
<td>CSD Node</td>
<td>Use WWW number and LUN number for fibre channel device node</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_1394</td>
<td>CSD Node</td>
<td>Use GUID as CSD for 1394 device path node</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_USB</td>
<td>CSD Node</td>
<td>Use interface number and port number for USB node</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_USB_CLASS</td>
<td>NONE</td>
<td>Not process.</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_I2O</td>
<td>CSD Node</td>
<td>Use Target ID as I2o Device Path</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_MAC_ADDR</td>
<td>CSD Node</td>
<td>Use MAC address as CSD for MAC node</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_IPv4</td>
<td>CSD Node</td>
<td>Use local IP address, local port, Remote IP address, remote port for IPv4 node</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_IPv6</td>
<td>CSD Node</td>
<td>Use local IP address, local port, Remote IP address, remote port for IPv6 node</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_INFINIBAND</td>
<td>CSD Node</td>
<td>Use PORT GID, IOC GUID, Target Port ID, Device ID</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_UART</td>
<td>CSD Node</td>
<td>Use Baud Rate, Data Bits, Parity, Stop Bits as CSD</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_VENDOR</td>
<td>CSD Node</td>
<td>Use GUID as CSD</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_LUN</td>
<td>CSD Node</td>
<td>Use the Logical Unit Number</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_SATA</td>
<td>CSD Node</td>
<td>Use the HBA Port Number, Port Multiplier, and LUN value.</td>
</tr>
<tr>
<td>MESSAGING_DEVICE</td>
<td>MSG_SAS</td>
<td>CSD Node</td>
<td>Use the SAS Address, LUN, Device Topology, and Relative Target Port</td>
</tr>
<tr>
<td>MEDIA_DEVICE</td>
<td>MEDIA_HARDDRIVE</td>
<td>CSD Node</td>
<td>Partition Number</td>
</tr>
<tr>
<td>MEDIA_DEVICE</td>
<td>MEDIA_CDROM</td>
<td>CSD Node</td>
<td>Boot Entry</td>
</tr>
<tr>
<td>MEDIA_DEVICE</td>
<td>MEDIA_VENDOR</td>
<td>CSD Node</td>
<td>Use Vendor_GUID as CSD</td>
</tr>
<tr>
<td>MEDIA_DEVICE</td>
<td>MEDIA_FILEPATH</td>
<td>NONE</td>
<td>Don’t process.</td>
</tr>
<tr>
<td>MEDIA_DEVICE</td>
<td>MEDIA_PROTOCOL</td>
<td>NONE</td>
<td>Don’t process.</td>
</tr>
<tr>
<td>MEDIA_DEVICE</td>
<td>MEDIA_FV_FILEPATH</td>
<td>NONE</td>
<td>Don’t process.</td>
</tr>
</tbody>
</table>
A.3.1  Get the MTD

The MTD is a string that carries device's media info. Such as floppy, hard disk or others. The MTD is a string that makes the mapping more readable.

Now, the MTD has four types: fp(floppy), hd(hard disk), cd(CD Rom) and f(unknown type).

The MTD's info come from the device path. the algorithm go through each node of the device path to find the special node that can specify this device's MTD.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>SUBTYPE</th>
<th>MTD</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDIA_DEVICE_PATH</td>
<td>MEDIA_HARDDRIVE</td>
<td>hd</td>
</tr>
<tr>
<td>EDIA_DEVICE_PATH</td>
<td>MEDIA_CDROM</td>
<td>cd</td>
</tr>
<tr>
<td>ACPI_DEVICE_PATH</td>
<td>ACPI &amp;HID=0x0604</td>
<td>fp</td>
</tr>
</tbody>
</table>

Note: If a device has the MEDIA_HARDDRIVE and MEDIA_CDROM device path node, then its MTD is cd.

If a device path has no any node list on the table, then, its MTD is f(unknown).

A.3.2  Get the HI

Each device can be separated into two part: the HI part and CSD part.

The HI part is used to get the HI section in the consistent mapping.

The CSD part is used to get the CSD section in the consistent mapping.

The algorithm of get HI goes through each device path in the system and extracts each HI node in the device path according Table 28 to create a HI device path.

A.3.3  Get the CSD

A device path remove the HI device path part, the remain part is the CSD part.

The algorithm is go through the CSD device part, to each node, according Table 28 get the data that will be add to the CSD, translate the data to a string of digital or character(according the position in the CSD).

A.3.3.1  USB Devices

CSD of hard drive device path node

Use partition number and interface for CSD
A.3.3.1 Example
usb(0,1) → a1
usb(1,0) → b0

A.3.3.2 Floppy Devices

General consistent mapping rule
Use _UID for CSD

A.3.3.2.1 Examples:
1. acpi(pnp0604,0) → a
2. acpi(pnp0604,1) → b
3. IDE Devices

A.3.3.3 CSD of ATAPI device path node

ATAPI node → ide channel index
0 for primary, master, 3 for secondary slave

A.3.3.4 CSD of LUN Device path node

Use the LUN number

A.3.3.4.1 Examples:
USB(0x2,0x1)/Unit(0x0) → c10
USB(0x2,0x1)/Unit(0x2) → c12

A.3.3.5 CSD of SAS Device path node

Use the SAS Address, followed by the LUN number, Device Topology Value, and Relative Target Port

A.3.3.6 CSD of SATA Device path node

Use the HBA Port Number, followed by the Port Multiplier Number, and the LUN value.

A.3.3.7 CSD of hard drive device path node

Hard disk node → partition number

Version 2.0
A.3.3.7.1  **Examples**

Ata(Primary, Master) → a
Ata(Primary, Slave) → b
Ata(Secondary, Master) → c
Ata(Secondary, Slave) → d

HD(p2, sig*) → c
CD(Entry0) → a

SCSI device

A.3.3.8  **CSD of SCSI device path node**

Use LUN number and PUN number for scsi node

A.3.3.8.1  **Examples:**

scsi(1,0) → b0
scsi(2,0) → c0
scsi(2,0)/scsi(1,0) → c0b0

A.3.3.9  **Fibre Channel Device Path**

Use WWW number and LUN number for fibre channel device node:

Acpi(0xa03)/pci(0,0)/FC(0x1b833212, 0x34a65)/HD(Part4, sig**4)

hd45bmwccxe654145e
(bmwccxe)26 = (1b833212)16, (4654145)10 = (34a65)16

A.3.3.10  **1394 Device Path**

Use GUID as CSD for 1394 device path node

Treat the guid as a string, for CSD, translate character by character

0001,db08,5001,0a5f → aaablaifaabaKfp

A.3.3.11  **I2o Device Path**

Use Target ID as I2o Device Path

A.3.3.12  **MAC Address Device Path**

Use MAC address as CSD for MAC node

IPv4 Device Path & IPv6 Device Path

Use local Ip address, local port, Remote Ip address, remote port for IPv4 node

A.3.3.13  **InfiniBand Device Path**

Use PORT GID, IOC GUID, Target Port ID, Device ID
A.3.3.14 UART Device Path

Use Baud Rate, Data Bits, Parity, Stop Bits as CSD

A.3.3.15 Vendor-Defined Device Path

Use guid as CSD

{18ABE39-F472-4278-BD55-E8C81C7030E1} →
biklokdpwech1lnffojimibmadaob

A.3.3.16 Vendor-defined Media Device Path

Use Vendor_GUID as CSD

A.3.3.17 File Path Media Device Path

Put file path in MTD

A.4 Function & Structure.

EFI_STATUS
ConsistMappingCreateHIDevicePathTable ( 
OUT EFI_DEVICE_PATH_PROTOCOL ***HIDevicePathTable 
); 

Parameters

HIDevicePathTable
A pointer to the Table of HI Device Path.

Description

This function will go through all the device paths in the system, extract the HI device path from each device path and add the HI device path to the HI device path table then sort the HI device path table.

In this function, only use the device path's first instance, if the device path has more than one instance, the other instances are ignored.

Extract the HI device path.

To each device path, go through each node from the first device path node. According to Table 33, if the node is the HI Device path node, add it to the HI Device, path, until meet the first NuHI Device path node.

Sort the HI device path table.

According the compare rules above, sort the HI device path table.
## Pseudo Code

```c
foreach handle in System
{
    Get DevicePath form handle;
    If DevicePath is null {
        Continue;
    }
    HIDevicePath = ExtractHI(DevicePath);
    Add the HIDevicePath to the HDPT
}
Sort the HDPT
```

### Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>Success to get the HI device path table.</td>
</tr>
<tr>
<td>SHELL_OUT_OF_RESOURCE</td>
<td>Can not create the HI device path table.</td>
</tr>
</tbody>
</table>

```c
CHAR16*
ConsistMappingGenMappingName(
    IN EFI_DEVICE_PATH_PROTOCOL    *DevicePath,
    IN EFI_DEVICE_PATH_PROTOCOL    **HIDevicePathTable
);
```

### Parameters

- **DevicePath**
  A pointer to a device path that will be translated to the consist name.

- **HIDevicePathTable**
  A pointer to the Table of HI Device Path.

### Description

This function go through each node of the DevicePath, extract the info about the MTD, HI, and CSD, and then according to the extracted info, create a consistent mapping.

### Pseudo Code

```c
Foreach handle in System
{
    Get DevicePath form handle;
    If DevicePath is null {
        Continue;
    }
    HIDevicePath = ExtractHI(DevicePath);
    Add the HIDevicePath to the HDPT
}
Sort the HDPT
```

### Status Codes Returned

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NULL</td>
<td>Can't create the consistent mapping.</td>
</tr>
<tr>
<td>NULL</td>
<td>The consistent mapping.</td>
</tr>
</tbody>
</table>
Sort the HI device path table.

Consist mapping device path compare:

```c
Compare(Node1, Node2) {
    If (DeviceType(Node1) != DeviceType(Node2)) {
        Return DeviceType(Node1) - DeviceType(Node2);
    }
    If (DeviceSubType(Node1) != DeviceSubType(Node2)) {
        Return DeviceSubType(Node1) - DeviceSubType(Node2);
    }
    If (DeviceSubType(Node) == PCI) {
        pci(d1, f1) > pci (d2, f2) only if d1 > d2 or (d1 = d2 and f1>f2)
    }
    If (DeviceSubType(Node) == ACPI) {
        pci(d1, f1) > pci (d2, f2) only if d1 > d2 or (d1 = d2 and f1>f2)
    }
    If (Length(Node) != Length(Node2)) {
        Return (Length(Node1) - Length(Node2));
    }
    Return memcmp(Node1, Node2, Length(Node1));
}
```
The manual page files are standard text files with title and section heading information embedded using commands which begin with a ".". The following two macros are supported:

```
.TH command-name 0 "short-description"
Title header. When printing multi-page help, this will appear at the top of each page.

.SH section-name
Sub-header. Specifies one of several standard sub-headings.
```

Table 30 Subheadings and descriptions

<table>
<thead>
<tr>
<th>Sub-Heading Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NAME</td>
<td>The name of the function or command, along with a one-line summary.</td>
</tr>
<tr>
<td>SYNOPISIS</td>
<td>Usage of the command</td>
</tr>
<tr>
<td>DESCRIPTION</td>
<td>General description</td>
</tr>
<tr>
<td>OPTIONS</td>
<td>Description of all options and parameters.</td>
</tr>
<tr>
<td>RETURN VALUES</td>
<td>Values returned.</td>
</tr>
<tr>
<td>ENVIRONMENT VARIABLES</td>
<td>Environment variables used</td>
</tr>
<tr>
<td>FILES</td>
<td>Files associated with the subject.</td>
</tr>
<tr>
<td>EXAMPLES</td>
<td>Examples and suggestions.</td>
</tr>
<tr>
<td>ERRORS</td>
<td>Errors reported by the command.</td>
</tr>
<tr>
<td>STANDARDS</td>
<td>Conformance to applicable standards.</td>
</tr>
<tr>
<td>BUGS</td>
<td>Errors and caveats.</td>
</tr>
<tr>
<td>CATEGORY</td>
<td>The comma-delimited list of categories to which this command belongs. Category names must follow normal file naming conventions. Category names which begin with &quot;_&quot; will not be used in the specification. See section TBD (&quot;Command-Line Help&quot;) for more information on how this category is used when installing new commands.</td>
</tr>
<tr>
<td>other</td>
<td>Other sections added by the help author.</td>
</tr>
</tbody>
</table>
# Appendix C UEFI Shell Status Codes

Most UEFI Shell commands return SHELL_STATUS code values. These UEFI Shell status codes are enumerated below.

<table>
<thead>
<tr>
<th>Mnemonic</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL_SUCCESS</td>
<td>0</td>
<td>The operation completed successfully</td>
</tr>
<tr>
<td>SHELL_LOAD_ERROR</td>
<td>1</td>
<td>The image failed to load.</td>
</tr>
<tr>
<td>SHELL_INVALID_PARAMETER</td>
<td>2</td>
<td>There was an error in the command-line options.</td>
</tr>
<tr>
<td>SHELL_UNSUPPORTED</td>
<td>3</td>
<td>The operation is not supported.</td>
</tr>
<tr>
<td>SHELL_BAD_BUFFER_SIZE</td>
<td>4</td>
<td>The buffer was not the proper size for the request.</td>
</tr>
<tr>
<td>SHELL_BUFFER_TOO_SMALL</td>
<td>5</td>
<td>The buffer is not large enough to hold the requested data. The required buffer size is returned in the appropriate parameter when this error occurs.</td>
</tr>
<tr>
<td>SHELL_NOT_READY</td>
<td>6</td>
<td>There is no data pending upon return.</td>
</tr>
<tr>
<td>SHELL_DEVICE_ERROR</td>
<td>7</td>
<td>The physical device reported an error while attempting the operation.</td>
</tr>
<tr>
<td>SHELL_WRITE_PROTECTED</td>
<td>8</td>
<td>The device cannot be written to.</td>
</tr>
<tr>
<td>SHELL_OUT_OF_RESOURCES</td>
<td>9</td>
<td>A resource has run out.</td>
</tr>
<tr>
<td>SHELL_VOLUME_CORRUPTED</td>
<td>10</td>
<td>An inconstancy was detected on the file system causing the operating to fail.</td>
</tr>
<tr>
<td>SHELL_VOLUME_FULL</td>
<td>11</td>
<td>There is no more space on the file system.</td>
</tr>
<tr>
<td>SHELL_NO_MEDIA</td>
<td>12</td>
<td>The device does not contain any medium to perform the operation.</td>
</tr>
<tr>
<td>SHELL_MEDIA_CHANGED</td>
<td>13</td>
<td>The medium in the device has changed since the last access.</td>
</tr>
<tr>
<td>SHELL_NOT_FOUND</td>
<td>14</td>
<td>The item was not found.</td>
</tr>
<tr>
<td>SHELL_ACCESS_DENIED</td>
<td>15</td>
<td>Access was denied.</td>
</tr>
<tr>
<td>SHELL_TIMEOUT</td>
<td>18</td>
<td>The timeout time expired.</td>
</tr>
<tr>
<td>SHELL_NOT_STARTED</td>
<td>19</td>
<td>The specified operation could not be started.</td>
</tr>
<tr>
<td>SHELL_ALREADY_STARTED</td>
<td>20</td>
<td>The specified operation had already started.</td>
</tr>
<tr>
<td>SHELL_ABORTED</td>
<td>21</td>
<td>The operation was aborted by the user.</td>
</tr>
<tr>
<td>SHELL_INCOMPATIBLE_VERSION</td>
<td>25</td>
<td>The function encountered an internal version that was incompatible with a version requested by the caller.</td>
</tr>
<tr>
<td>SHELL_SECURITY_VIOLATION</td>
<td>26</td>
<td>The function was not performed due to a security violation.</td>
</tr>
<tr>
<td>--------------------------</td>
<td>----</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>SHELL_NOT_EQUAL</td>
<td>27</td>
<td>The function was performed and resulted in an unequal comparison.</td>
</tr>
</tbody>
</table>
Appendix D  UEFI Shell
Command Standard
Formatted Output

This section describes the general, table-based standard output format for UEFI shell commands. The format is designed so that tools can easily process output produced by shell commands.

UEFI shell commands using standard formatted output display the same information they would normally display, except using rows and columns of comma-delimited data. The first column always contains a C-style identifier which describes the type of data on the row. This identifier is known as the table name. Table names which begin with the '_' character are implementation-specific.

The second and subsequent columns are quoted C-style strings containing the actual UEFI shell command data. For each UEFI shell command, the format and meaning of each column depends on the column number and the table name.

Shell commands which support the –sfo option will always produce the table name ShellCommand. The second column contains the name of the shell command without any extension. For example:

ShellCommand,"ls"

For example:

FileInfo,"fs0:/efi/boot/winloader.efi","45670","arsh"
FileInfo,"fs0:/efi/boot/timsfile.txt","12500","a"
FileInfo,"fs0:/efi/boot/readme.txt","795","a"

In the syntax below, an identifier is a C-style identifier, which starts with an alphabetic character or underscore. A quoted string starts with a double-quotation mark (" character, followed by zero or more characters and concluding with a double-quotation mark (" ) character. Quotation marks in the string must be escaped by using a ^ character (i.e. ^" ). The ^ character may be inserted using ^\.

Extended Syntax

sfo-format := sfo-row
          sfo-row <EOL> <sfo-row>
sfo-row  := sfo-table-name, sfo-columns
sfo-table-name := identifier
sfo-columns := sfo-column |
sfo-columns, | sfo-column

sfo-column := quoted-string | <empty>

Example

VolumeInfo, "TimsVolume", "40000000", "32000000", "16000000"
FileInfo, "fs0:/efi/boot/winloader.efi", "45670", "arsh"
FileInfo, "fs0:/efi/boot/timsfile.txt", "1250", "a"
FileInfo, "fs0:/efi/boot/readme.txt", "795", "a"