

NAND Flash File System

Overview

The Arasan NAND Flash File System provides a high-performance and reliable software solution to embedded systems using NAND flash memories. The versatile NAND Flash File System is designed to meet the requirements for applications such as cell phones, media players, cameras, video camcorders, laptops, and servers.

The Arasan NAND Flash File System is an ANSI C compliant program that interfaces to the application layer on one side and the NAND flash controller on the other side. The File Management system consists of standard C library files for the API such as create, open, close, read and write. It also provides a high-level power failure safety feature that guarantees all saved data are safe and the file system structure are not corrupted.

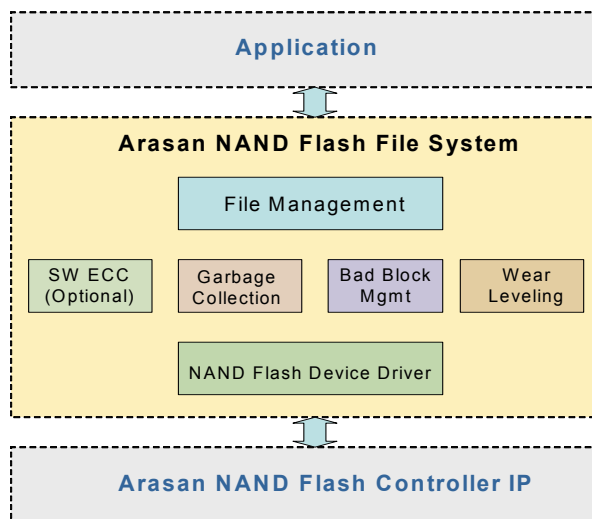
The NAND File System provides many functions to maximize the efficiency and utilities of the NAND flash memories. These include garbage collection to reclaim discarded blocks, wear leveling to ensure all blocks are evenly utilized to prolong the memory lifetimes, bad block management to record bad block locations, and a selectable hardware ECC available in the Arasan NAND Flash Controller IP to handle error detection and error correction.

The NAND Flash Driver interfaces to the Arasan NAND Flash Controller IP. It implements the firmware interface to operate the controller and its NAND flash memories. The NAND Flash Driver supports commands of commercially available NAND flash memories to provide maximum system performance.

Features

- Supports standard NAND flash memories
- Standard ANSI C compliant
- Portable to Linux, WinCE, and other operating systems
- Supports FAT16, FAT32, and other file system interfaces
- Reliable, Re-entrant Embedded File System
- Supports dynamic creation and deletion of files, directories, and links
- Long file name support
- Concurrent use of multiple volumes
- Multilevel write protection
- Multiple media support
- Low level NAND flash drivers
- Use of flash memory invisible to applications
- Transparent wear leveling prolongs memory life span
- Garbage collection
- Detects bad blocks
- Supports hardware ECC available in Arasan NAND Flash Controller IP
- Selectable ECC on/off
- Easy integration to custom hardware platforms
- Supports SLC and MLC NAND flash memories

The Arasan NAND Flash File System



NAND Flash File System

File Management:

The ANSI C compliant File Management system interface provides the high-level APIs. The reliable, re-entrance system restores system states and avoid data loss in the event of unexpected power loss. FAT16, FAT32, and other file system interfaces are supported.

NAND Flash Management:

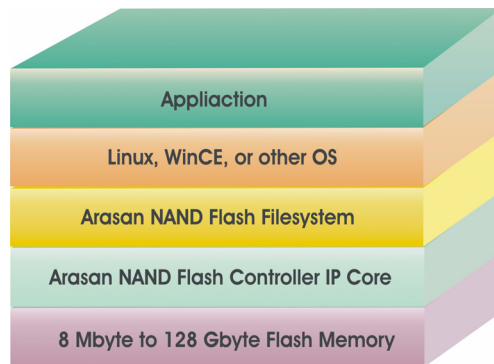
The NAND Flash Management system includes all utilities required to maximize the performance and life span of the NAND Flash memory devices. Garbage collection is performed to reclaim discarded blocks so that they may be reused. Wear leveling is to ensure that all blocks are utilized evenly in order to prolong the life span of the NAND Flash memories. Wear leveling is especially important for increasing the lifetimes of high-density MLC NAND flash memories. Bad block management is required to identify and record

bad blocks to ensure that the data is properly stored.

NAND Flash Device Driver:

The NAND Flash Device Driver provides I/O and other hardware functions for the Arasan NAND Flash Controller IP (provided separately). Such functions include controller initialization, and NAND Flash commands and data handling. The Device Driver also controls the on/off state of the hardware ECC available in the Arasan NAND Flash Controller IP. The use of ECC is to enhance the NAND flash performance and to maintain the data integrity. Custom device drivers can be developed to support specific hardware controllers.

The Arasan NAND Flash File System in a system environment.



Benefits:

- Conforms to ANSI C standards
- Portable to any OS
- Premier direct support from Arasan engineering team
- Industrial standard test-bench development platforms available from Arasan

Deliverables:

- C source code
- Technical documents

Supported Platforms:

- Platforms: Linux and WinCE
- Ported to other OSs



Arasan Chip Systems, Inc.

2010 N. First St. Suite #510
San Jose CA 95131
Phone: 408-282-1600
Fax: 408-282-7800

Data Sheet Link:

NAND Flash Controller IP Core:
<http://www.arasan.com/datasheets/login.php>

For a complete directory of Arasan IPs, please visit:
www.arasan.com