



Comprehensive software management for raw flash memory

FlashFX® Tera is an intelligent software manager for flash memory. With pre-written drivers that support hundreds of NAND and NOR parts, including SPI, hybrid flash, and application processor flash controllers, FlashFX Tera offers developers unprecedented versatility and control. Its patented bad block management provides a robust solution for rapid integration and complete management of flash memory in any embedded system.

A single solution to support the spectrum of flash technology

Last minute changes in parts availability can derail even the best planned project. Protect yourself with a versatile software solution that can be configured on-the-fly and is built to accommodate demands of high-volume manufacturing and long-lived products.

Our solution:

- Supports SLC/MLC NAND and NOR flash using a parallel or serial SPI interface from multiple vendors in one driver.
- Wear-leveling, bad block management, and configurable error manager protect flash from premature failure.
- Includes run-time flash part and/or NAND controller selection.
- Adheres to strictest NAND programming standards, including support for addressing read disturb and charge migration.
- Multi-threaded architecture reduces latency between multiple flash access requests.
- Offers superior performance regardless of file system.
- Optional software ECCs provide up to 5-bit detection, 4-bit correction per 512 bytes of data, and 4 bytes of metadata.*
- Works with any 32-or 64-bit operating system, or in a “no OS” system.

Pre-ported versions available for:

- Linux and Android
- Wind River VxWorks
- Microsoft Windows Embedded Compact

*For optimal performance, we recommend that ECCs over 2-bit detect/1-bit correct should be done in hardware.

FEATURES

	FlashFX Tera	Other flash drivers
Multiple flash types with one driver	•	
Latency configuration options	•	
Wear-leveling	Static and dynamic	Dynamic only
Background compaction	•	•
NAND bad block management	•	BSP vendor
Configurable error policy manager	•	
Support for raw SLC/MLC NAND and NOR	•	•
Scrubbing of read disturb / charge migration errors	•	
Support for SPI NAND/NOR	New in 4.0	
Support for raw SLC/MLC NAND	•	Varies
Support for ECC-managed	•	

Supported hardware*

CPUs

FlashFX Tera is CPU independent and will work with any 32- or 64-bit CPU for which an ANSI C compiler is available.

NAND controllers

FlashFX Tera can be ported to work with standalone NAND controllers and those built into many popular CPUs, including NXP i.MX, TI OMAP, and Marvell PXA families. It also can support NAND flash with a built-in (on die) error correction (ECC), including EZ-NAND.

Reference platforms

FlashFX Tera includes preconfigured projects for some popular reference platforms, allowing a developer to get up and running quickly.

Flash parts

FlashFX Tera supports the industry’s largest variety of serial (SPI) and parallel NAND and NOR flash parts from all major vendors, including: Micron, Samsung, SK Hynix, Spansion (Cypress), and Toshiba.

Flash vendors offer exhaustive product lines, and listing every device for every family they offer is impractical. Please see our website for the most recent supported hardware list, which contains a list of flash parts, and platforms for which we have been able to test our software inhouse. If the device you’re interested in does not appear in the supported hardware list, there’s still a very good chance that it falls within a family of devices that is listed and will work with our products with minimal effort. Contact Tuxera’s support team for questions about any parts you are considering.

* Please see the FlashFX Tera supported hardware list for details

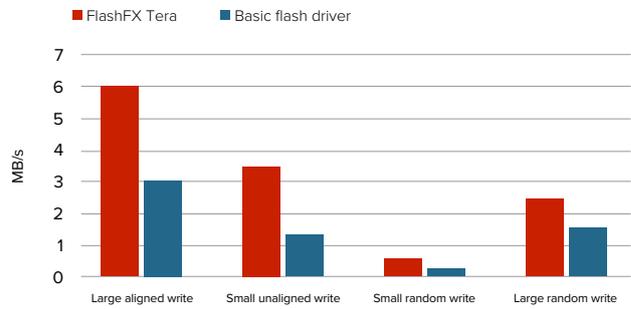


Figure 1. FlashFX Tera nearly doubles write performance for writes, both large and small.

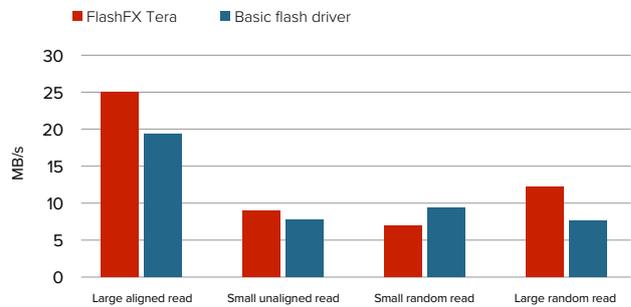


Figure 2. FlashFX Tera improves read speeds for all but small random reads.

Test platform for both figures: TI OMAP 3530, ARM Cortex A8, “Beagleboard”, Microsoft Windows Embedded Compact 7, 256 MB raw NAND flash.

Test program for both figures: FSIO, a comprehensive filesystem-independent test included with Tuxera products.

REQUIREMENTS

Target configuration	32- or 64-bit OS, any CPU, NOR and/or NAND flash memory, 100 KB RAM (Typical)
Development system	Windows 32 or 64 host; 4 MB of disk space for Flash FX Tera; sufficient RAM for dev tools
Media volume size	Each partition (or disk) can be scaled from 64 KB to 2 TB — number of disks is configurable
Page size	Native page support and small block emulation for 512 byte to 32 KB

Software development kit & licensing

FlashFX Tera is provided in ANSI C source and includes a developer's guide, API reference, and validation utilities. We offer a flexible development and runtime license structure, with royalty-free options available.

Accessible, award-winning support

Customer support and problem-solving are Tuxera's company cornerstones. Our support for customers is well known in the embedded industry, having received silver and bronze Stevie® Awards for Customer Service Department of the Year – Computer Software category.

Our team of flash and file system experts will support you all the way from evaluation to implementation, going above and beyond to ensure your project performs flawlessly and on schedule. We offer annual support subscriptions with a choice of service level options, so you can select the right degree of support that suits your needs.

Premium flash memory management

Let FlashFX Tera turbocharge your data management needs reliably and securely. Its high performance, multi-threaded flash drivers provide superior wear-leveling, bad block management, fast read and write speeds, and more.

Tuxera will support you the whole way – we have nearly two decades of experience solving complex challenges in interoperability and storage performance. So put our world-leading team of file system and embedded storage specialists to work for you.

**Let us ensure your flash data handling is stable and versatile.
Get in touch with us at sales@tuxera.com**