

Microsoft NTFS by Tuxera— Technical specifications

General information



<p>Supported operating systems</p>	<p>Android, Linux, QNX</p> <p><i>Features and/or specifications may vary depending on the operating system.</i></p>																												
<p>Hardware architectures</p>	<ul style="list-style-type: none"> • ARM, ARM64, Intel x86/x86_64 or compatible, MIPS, PowerPC, SuperH, and more • Support for all NTFS versions (1.0, 1.1, 1.2, 3.0 and 3.1), including XP, Vista, Windows 7, Windows 8.0, Windows 8.1, and Windows 10 • Support for all storage types like eMMC, eSD, SD card, CF card, UFS, memory stick, SSD, HDD via USB, SATA, eSATA, FireWire, MMC, and more 																												
<p>Capacity</p>	<ul style="list-style-type: none"> • Maximum volume size: <ul style="list-style-type: none"> – 32-bit system without CONFIG_LBD enabled in the kernel: 2TiB – 64-bit system and 32-bit system with CONFIG_LBD enabled in the kernel, depends on cluster size: <table border="1"> <thead> <tr> <th>Cluster size</th> <th>Maximum volume size</th> </tr> </thead> <tbody> <tr><td>512 bytes</td><td>2 TiB</td></tr> <tr><td>1 kiB</td><td>4 TiB</td></tr> <tr><td>2 kiB</td><td>8 TiB</td></tr> <tr><td>4 kiB (default size)</td><td>16 TiB</td></tr> <tr><td>8 kiB</td><td>32 TiB</td></tr> <tr><td>16 kiB</td><td>64 TiB</td></tr> <tr><td>32 kiB</td><td>128 TiB</td></tr> <tr><td>64 kiB (earlier max)</td><td>256 TiB</td></tr> <tr><td>128 KiB</td><td>512 TiB</td></tr> <tr><td>256 KiB</td><td>1 PiB</td></tr> <tr><td>512 KiB</td><td>2 PiB</td></tr> <tr><td>1024 KiB</td><td>4 PiB</td></tr> <tr><td>2048 KiB (max size)</td><td>8 PiB</td></tr> </tbody> </table> • Maximum cluster size: 2048 KiB <ul style="list-style-type: none"> – Maximum file size: <ul style="list-style-type: none"> 32-bit system: <ul style="list-style-type: none"> ▪ 8 TiB with 4 kiB CPU page size ▪ 128 TiB with 64 kiB CPU page size 64-bit system: 8 EiB • Maximum filename length: 255 characters (16-bit) • File size field length: 64-bit • Supported sector sizes: 512, 1024, 2048, and 4096 bytes 	Cluster size	Maximum volume size	512 bytes	2 TiB	1 kiB	4 TiB	2 kiB	8 TiB	4 kiB (default size)	16 TiB	8 kiB	32 TiB	16 kiB	64 TiB	32 kiB	128 TiB	64 kiB (earlier max)	256 TiB	128 KiB	512 TiB	256 KiB	1 PiB	512 KiB	2 PiB	1024 KiB	4 PiB	2048 KiB (max size)	8 PiB
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<p>Scalability</p>	<ul style="list-style-type: none"> • No practical limit on number of files, folders, file sizes, and partition sizes • Directory contents stored in B+ tree structures 																												

System requirements

Minimum system requirements	<ul style="list-style-type: none"> • RAM: 1 MB • Processor: 25 MHz
Memory and CPU footprint	<ul style="list-style-type: none"> • Read-write: 140-280 KiB • Read-only: 60-90 KiB • CPU usage: 0-10%

Proprietary file system features

Power-safe/fail-safe	Volume consistency ensured if storage is removed, or power or battery is disconnected
Tuxera POSIX test suite	<p>Tuxera maintains POSIX File System Test Suite. The following system calls are tested:</p> <ul style="list-style-type: none"> • chmod: changes permission • chown: changes ownership • link: creates hardlinks • mkdir: creates directories • mkfifo: creates fifo files • open: opens a file • rename: changes file name • rmdir: removes directories • symlinks: creates symbolic links • truncate: decreases/increases file size • unlink: removes regular files, symbolic links, fifos, and sockets • xacl: reports errors when getting/setting ACLs
POSIX conformance	<ul style="list-style-type: none"> • Common functions: <ul style="list-style-type: none"> – read – write – directory list – rename – create – delete • UTF-8 file names • Time creation, modification, access, and attribute change • Hardlinks • Symbolic links, pipes, devices (optional feature) • Extended attributes (optional feature) • Ownership and permissions (optional feature)
Windows filename compatibility	Several filename namespaces: DOS, WIN32, and POSIX
Sparse files	Efficiently store very large, mostly empty files (read-only support)
Compression	Full support for reading compressed files

Performance and reliability

High performance	<ul style="list-style-type: none"> • Active superblock (MFT), file, directory, attribute and data caching. Advanced algorithms and data structures ensure maximum I/O throughput, low CPU usage for small and large files, and high IOPS for file operations. • Read/write performance is up to 50 times better compared to the open-source NTFS-3G driver • Tunable settings. Workload-specific optimizations • Low power use, optimized for increased battery life • Minimizes data fragmentation • Efficient free-space management • Support for data streaming with low power consumption • Zero-copy, direct I/O support • POSIX fallocate support
Reliability	Rigorous quality assurance, wide deployment, and fault-tolerant design guarantee outstanding file system robustness.

Licensing and maintenance

Customization and maintenance	<ul style="list-style-type: none"> • Maintenance services are provided so that deployment and development can be tailored through product answers to inquiries and product updates. • Microsoft NTFS by Tuxera can be custom-adapted to any software environment
Licensing	Proprietary, commercial

Optional features

Encryption	Support for backup/restore without decrypting
Access control	<ul style="list-style-type: none"> • Linux permissions supported (optional) • Special access flags emulated (sticky, setuid, setgid)
Ownership and permissions	Relies on a custom extended attribute
Extended attributes	<ul style="list-style-type: none"> • NTFS attributes • NTFS ACLs
Tools	<ul style="list-style-type: none"> • mknfts: creates an NTFS file system • nftslabel: gets/sets NTFS label • nftscck: checks and repairs NTFS • nftsdebug: collect metadata/volume debug images

Get in touch to start your evaluation of Microsoft NTFS by Tuxera: sales@tuxera.com