

Microsoft NTFS by Tuxera—Technical specifications

1. General features

Supported operating systems	<ul style="list-style-type: none"> • Android, Linux, Chrome OS, Firefox OS, Tizen 																		
Hardware architectures	<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 																		
Capacity	<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: 2 TiB » 64-bit system and 32-bit system with CONFIG_LBD enabled in the kernel, depends on cluster size: <table border="1" style="margin-left: 20px;"> <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 (maximum size)</td> <td>256 TiB</td> </tr> </tbody> </table> • Maximum cluster size: 64 kiB • 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 (maximum size)	256 TiB
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Scalability	<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 																		

2. 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%
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3. Proprietary file system features

Power-safe/fail-safe	<ul style="list-style-type: none"> • Volume consistency ensured if storage is removed, or power or battery is disconnected
Tuxera POSIX test suite	<ul style="list-style-type: none"> • Tuxera maintains POSIX File System Test Suite. The following system calls are tested: <ul style="list-style-type: none"> » chmod: changes permission » chown: changes ownership » link: creates hardlinks » mkdir: creates directories » 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	<ul style="list-style-type: none"> • Several filename namespaces: DOS, Win32, and POSIX
Sparse files	<ul style="list-style-type: none"> • Efficiently store very large, mostly empty files (read-only support)
Compression	<ul style="list-style-type: none"> • Full support for reading compressed files

4. 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	<ul style="list-style-type: none">• Rigorous quality assurance, wide deployment, and fault-tolerant design guarantee outstanding file system robustness.

5. 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	<ul style="list-style-type: none">• Proprietary, commercial

6. Optional features

Encryption	<ul style="list-style-type: none">• 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	<ul style="list-style-type: none">• Relies on a custom extended attribute
Extended attributes	<ul style="list-style-type: none">• NTFS attributes• NTFS ACLs
Several tools	<ul style="list-style-type: none">• mkntfs (creates an NTFS file system)• ntfsinfo (provides internal NTFS metadata information)• ntfslabel (gets/sets NTFS label)• ntfsck (checks and repairs NTFS)• ntfsdebug (collect metadata/volume debug images)• Support for all types of Microsoft Dynamic Volumes (simple, spanned, striped, mirrored, RAID-5)• Support to read and write any named data streams (via extended attributes)

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