

NEW ENGLISH FILE INTERMEDIATE PLUS TEST BOOKLET Tutorial

new english file intermediate plus test booklet is an essential resource for learners aiming to enhance their English language skills at the intermediate plus level. Designed to complement the main coursebook, this test booklet provides a comprehensive set of exercises, assessments, and practice tests that help students consolidate their knowledge, prepare for exams, and track their progress effectively. Whether used in classroom settings, self-study, or tutoring sessions, the New English File Intermediate Plus Test Booklet serves as a valuable tool to reinforce learning and build confidence in using English in various contexts.

Understanding the Purpose of the New English File Intermediate Plus Test Booklet

What is the Test Booklet?

The New English File Intermediate Plus Test Booklet is a supplementary resource that contains a variety of tests and exercises aligned with the curriculum of the Intermediate Plus level. It is designed to assess students' understanding of vocabulary, grammar, reading comprehension, listening, and writing skills. The booklet allows learners to evaluate their progress periodically, identify areas for improvement, and prepare effectively for language proficiency exams such as the B1 or B2 levels.

Why Use the Test Booklet?

Using this test booklet offers numerous benefits:

- Provides authentic practice tests similar to real exam formats
- Tracks individual progress over time
- Helps identify strengths and weaknesses
- Boosts exam confidence through regular practice
- Enhances overall language competence by targeting all skill areas

Features of the New English File Intermediate Plus Test Booklet

Variety of Exercise Types

The booklet includes a diverse range of exercises designed to simulate real exam tasks:

- Multiple-choice questions for vocabulary and grammar
- Fill-in-the-blank activities to test comprehension
- Matching exercises for collocations and phrasal verbs
- Short answer and essay questions for writing practice
- Listening comprehension tasks with accompanying questions
- Reading passages followed by comprehension questions

Progressive Difficulty

The tests are structured to gradually increase in complexity, allowing learners to build confidence as they advance. Early tests focus on fundamental concepts, while later assessments challenge students with more complex language use and exam-style questions.

Aligned with Course Content

The test booklet mirrors the content covered in the New English File Intermediate Plus coursebook, ensuring consistency and relevance. It includes exercises based on the vocabulary, grammar points, and themes discussed in class.

How to Use the New English File Intermediate Plus Test Booklet Effectively

Regular Practice

Consistency is key to language improvement. Schedule regular testing sessions, such as weekly or bi-weekly, to monitor progress and reinforce learning.

Simulate Exam Conditions

To maximize exam readiness, create a distraction-free environment and adhere to the time limits specified for each test. This practice helps students manage exam anxiety and improve time management skills.

Review and Reflect

After completing each test, thoroughly review the answers, especially the incorrect ones. Use the answer keys and explanations provided to understand mistakes and clarify doubts.

Supplement with Other Resources

While the test booklet is comprehensive, combining it with other study materials?such as vocabulary flashcards, grammar reference guides, and listening practice apps?can provide a well-rounded preparation.

Benefits of Integrating the Test Booklet into Your Study Routine

Enhanced Self-Assessment

The booklet enables learners to assess their abilities objectively, which is crucial for setting realistic goals and tracking progress over time.

Preparation for Official Exams

Practicing with tests similar to those found in official language exams helps students familiarize themselves with the format and question types, reducing test anxiety and improving scores.

Building Confidence

Repeated practice and successful completion of tests foster a sense of achievement, motivating learners to continue their studies with enthusiasm.

Additional Tips for Maximizing the Benefits of the Test Booklet

- **Set Clear Goals:** Determine what skills you want to improve each week and select appropriate tests accordingly.
- **Use as a Learning Tool:** Don't just aim for correct answers?study the explanations and learn from mistakes.
- **Track Progress:** Keep a record of test scores and note areas that need further practice.
- **Join Study Groups:** Discussing tests with peers can offer new insights and enhance understanding.
- **Combine with Listening and Speaking Practice:** Use the test booklet alongside speaking clubs or listening exercises to develop all-round proficiency.

Where to Find the New English File Intermediate Plus Test Booklet

The Test Booklet is typically available through authorized educational publishers, language schools, and online bookstores. It can be purchased as a standalone resource or as part of a comprehensive course package. Additionally, some digital versions might be available for interactive practice, which

can be especially useful for tech-savvy learners.

Conclusion

The **New English File Intermediate Plus Test Booklet** is a powerful tool that supports learners in their journey toward English language mastery. By providing authentic practice tests, detailed exercises, and progress tracking, it complements the core course material and prepares students for real-world language use and official examinations. Regular use of this booklet not only enhances confidence but also accelerates language acquisition, making it an invaluable resource for anyone committed to achieving their English learning goals.

Remember, consistent practice, active review, and a positive attitude toward learning are the keys to success. Incorporate the Test Booklet into your study routine, and watch your English skills flourish!

New English File Intermediate Plus Test Booklet: A Comprehensive Review

In the realm of English language learning, particularly for intermediate learners striving to refine their skills, the New English File Intermediate Plus Test Booklet stands out as a valuable resource. Designed to complement the main textbook, this test booklet offers a structured approach to assessment, practice, and progression, making it an essential tool for both students and educators. In this article, we will explore the features, design, content, and pedagogical advantages of this test booklet, providing an in-depth analysis to help you understand its role in language acquisition.

Overview of the New English File Intermediate Plus Test Booklet

The New English File series, developed by Oxford University Press, is renowned for its engaging content, balanced focus on skills, and contemporary approach to language learning. The Intermediate Plus level targets learners who have a solid foundation but require further practice to reach advanced proficiency. The accompanying Test Booklet acts as a bridge to evaluate progress, reinforce learning, and prepare students for real-world communication.

This test booklet is structured to serve multiple purposes:

- Assessment of Learner Progress
- Practice of Core Language Skills
- Preparation for Final Certification or Exams
- Teacher's Resource for Tracking Development

It is meticulously designed to align with the curriculum, ensuring that learners are tested on relevant language points, vocabulary, and skills.

Design and Layout of the Test Booklet

User-Friendly Interface

One of the most commendable aspects of the New English File Intermediate Plus Test Booklet is its clear, accessible design. The layout features:

- Logical Organization: Tests are divided into sections corresponding to units or themes, facilitating targeted practice.
- Color-Coding and Visuals: Subtle use of color highlights different sections, making navigation easier for both teachers and students.
- Readable Typography: Large, clean fonts reduce eye strain and improve comprehension.

Structured Sections

The booklet typically includes:

- Listening Tests

These assess comprehension skills, often with audio prompts included in the accompanying media or online platform.

- Reading Comprehension

Passages of varying lengths and genres, accompanied by questions testing understanding, inference, and vocabulary context.

- Vocabulary and Grammar Tests

Focused on consolidating key language points, these sections include multiple-choice questions, gap-fills, and sentence transformations.

- Writing Tasks

Prompts for short essays, emails, or reports, aimed at developing productive skills.

- Speaking Practice

Though primarily a written resource, some versions include prompts or activities to facilitate oral practice, often in conjunction with classroom activities.

- Answer Keys and Score Sheets

For self-assessment and teacher correction, detailed answer keys are included, sometimes with suggested scoring rubrics.

Content and Pedagogical Features

Alignment with Learning Objectives

The content within the test booklet is carefully curated to mirror the learning objectives of the New English File Intermediate Plus course. This ensures that assessments are relevant and comprehensive, covering:

- Grammar points such as conditionals, reported speech, and relative clauses.
- Vocabulary themes like travel, health, work, and culture.
- Functional language for everyday situations and formal contexts.
- Skills integration, combining listening, reading, writing, and speaking.

Progressive Difficulty

Tests are designed to gradually increase in difficulty, challenging learners to apply their knowledge in more complex contexts as they advance. This scaffolding approach aids in building confidence and competence systematically.

Authentic and Contextualized Content

Rather than relying solely on artificial exercises, the test booklet incorporates authentic materials such as:

- Excerpts from newspapers, magazines, or dialogues mimicking real-life scenarios.
- Visual stimuli like photographs or charts to enhance comprehension.
- Cultural references providing context and cultural awareness.

Focus on Exam Readiness

Given that many learners aim to pass language proficiency exams, the booklet includes practice questions modeled on typical formats, such as multiple choice, short answer, and essay prompts, preparing students for standardized assessments.

Pedagogical Advantages of the Test Booklet

Assessment for Learning

The Test Booklet serves as both a diagnostic and formative tool. Regular testing helps identify areas of strength and weakness, guiding both teachers and students to focus their efforts efficiently.

Encourages Self-Directed Learning

With answer keys and scoring guides, learners can assess their own progress, fostering independence and motivation. Self-evaluation encourages reflective learning and helps learners take ownership of their development.

Supports Differentiated Instruction

Teachers can tailor classroom activities based on test results, providing remedial exercises for weaker areas or advanced tasks for learners excelling in certain skills.

Reinforces Classroom Learning

The tests complement classroom lessons, reinforcing vocabulary, grammar, and skills introduced in the main textbook. This repetition and practice solidify understanding and retention.

Practical Tips for Using the Test Booklet Effectively

To maximize the benefits of the New English File Intermediate Plus Test Booklet, consider the following strategies:

- Regular Use: Incorporate tests periodically to monitor progress and prevent gaps.
- Simulate Exam Conditions: For exam preparation, simulate timed tests to build confidence and manage exam anxiety.
- Use as Homework: Assign sections as homework to encourage independent practice.
- Review and Discuss: Go over incorrect answers with learners, explaining mistakes and clarifying doubts.

- Combine with Other Resources: Use alongside online platforms, listening exercises, and speaking activities for a comprehensive approach.

Conclusion: Is the New English File Intermediate Plus Test Booklet Worth It?

For educators and learners committed to achieving intermediate to advanced proficiency, the New English File Intermediate Plus Test Booklet offers a robust, thoughtfully designed assessment resource. Its alignment with the course content, authentic materials, and pedagogical versatility make it an indispensable component of the learning process.

The booklet's comprehensive coverage of skills, coupled with its user-friendly design and focus on real-world language use, ensures that learners are not only tested but also motivated to improve. Meanwhile, teachers benefit from a reliable tool to gauge progress, tailor instruction, and prepare students for success beyond the classroom.

In sum, investing in this test booklet is an investment in structured, meaningful learning—an essential step toward mastering English at the intermediate plus level.

Note: To get the most out of the New English File Intermediate Plus Test Booklet, it is advisable to use it in conjunction with the main coursebook, digital resources, and interactive activities, creating a holistic language learning environment.

Question What is included in the New English File Intermediate Plus Test Booklet? The Test Booklet includes comprehensive assessments such as listening, reading, writing, and speaking tests designed to evaluate students' progress at the Intermediate Plus level. How can I best prepare for the New English File Intermediate Plus tests? Regular practice with the unit reviews, mock tests from the Test Booklet, and reviewing vocabulary and grammar sections will help you prepare effectively. Are there answer keys available for the New English File Intermediate Plus Test Booklet? Yes, the Test Booklet typically comes with an answer key to facilitate self-assessment and teacher grading. How does the New English File Intermediate Plus Test Booklet align with the course content? It is designed to complement the course units, providing assessments that reflect the skills and topics covered in the Student Book and Class Book. Can I use the New English File Intermediate Plus Test Booklet for exam preparation? Absolutely, it serves as a useful resource for practice tests and exam-style questions to boost confidence and readiness. Where can I purchase or access the New English File Intermediate Plus Test Booklet? It is available through authorized book retailers, online educational platforms, or directly from the publisher's website. Is the New English File Intermediate Plus Test Booklet suitable for self-study? Yes, learners can use it for self-assessment, but it is ideally used alongside instructor guidance or supplementary materials. How often should I use the New English File Intermediate Plus Test Booklet in my study routine? Incorporate it regularly, such as after completing each unit, to track progress and identify areas

needing improvement. Are there online resources linked to the New English File Intermediate Plus Test Booklet? Many editions offer online practice tests and supplementary materials that complement the content of the Test Booklet. What are the benefits of using the New English File Intermediate Plus Test Booklet in classroom settings? It provides structured assessments, helps monitor student progress, and prepares learners effectively for standardized exams.

Related keywords: English File, Intermediate Plus, test booklet, language learning, exam preparation, English practice, classroom materials, learner resources, testing booklet, language assessment

Windows Nt File System Internals En Anglais

windows nt file system internals en anglais

Understanding the internal architecture of the Windows NT file system is essential for IT professionals, cybersecurity experts, and developers working with Windows-based environments. The Windows NT operating system, introduced in the early 1990s, revolutionized Windows architecture by providing a robust, secure, and scalable platform. Its file system internals are complex but crucial for ensuring data integrity, security, and performance. This article provides a comprehensive overview of Windows NT file system internals, exploring key components, data structures, and operational mechanisms.

Overview of Windows NT File System Architecture

The Windows NT file system architecture is designed to abstract hardware details and provide a consistent interface for applications and users. It comprises several layers, including hardware abstraction, the I/O manager, file system drivers, and the user-mode interface.

Key Components of the File System

- NTFS (New Technology File System): The primary file system used in Windows NT and later versions, known for its advanced features like journaling, security descriptors, and support for large files.
- File System Drivers: Kernel mode drivers responsible for managing specific file systems such as NTFS, FAT32, or exFAT.
- Object Manager: Manages kernel objects, including files, directories, and symbolic links.
- Cache Manager: Handles caching of data to improve performance.

- I/O Manager: Coordinates all input/output operations between user applications and hardware devices.

Core Data Structures in NTFS

The effectiveness of the NTFS file system relies heavily on several core data structures that organize and manage data on disk.

Master File Table (MFT)

- Central to NTFS, the MFT contains a record for every file and directory.
- Each record is a fixed-size data structure (typically 1 KB).
- Stores metadata such as filename, timestamps, permissions, and pointers to data extents.
- Enables quick file access and efficient management of files.

File Record

- Represents individual files or directories.
- Contains attributes like standard information, filename, security descriptors, data runs, and more.
- Uses a structured format with attribute headers and data.

Attributes

- Basic units of information stored about files.
- Types include Standard Information, File Name, Data, Security Descriptor, and others.
- Can be resident (stored within the MFT record) or non-resident (pointing to external clusters).

Data Runs

- Describe how file data is laid out on disk.
- Use a run-length encoding scheme to specify sequences of clusters.
- Enable efficient mapping of logical file offsets to physical disk locations.

NTFS File System Internals and Operations

Understanding how NTFS reads, writes, and manages files is key to grasping its internal

mechanisms.

File Creation and Opening

- When a file is created or opened, the system searches the MFT for a matching record.
- If creating a new file, a new record is allocated, initialized, and linked into directory structures.
- Opening a file involves locating its record and establishing a handle.

Reading and Writing Data

- Data is accessed through data runs in the file's attributes.
- For resident data, the data resides within the MFT record.
- For non-resident data, the data runs provide a mapping to disk clusters.
- The Cache Manager optimizes repeated access by caching data in memory.

File Deletion and Truncation

- Mark the file as deleted by updating its MFT record.
- The actual data remains on disk until overwritten or the space is reclaimed through defragmentation.

Security and Permissions in NTFS

Security is integral to NTFS, with features enabling fine-grained access control.

Security Descriptors

- Store permissions, ownership, and audit settings.
- Associated with files and directories via attributes.
- Use Access Control Lists (ACLs) to specify permissions for users and groups.

Access Control Lists (ACLs)

- Contain Access Control Entries (ACEs) that define permissions.
- Enable complex security policies.
- Are checked during file access operations to enforce security.

Journaling and Data Integrity

NTFS employs journaling to maintain data integrity, especially in case of system crashes or power failures.

Log File and Transactional Operations

- NTFS maintains a log (USN journal) recording changes.
- Uses transactions to ensure consistency; either all changes are committed or none.
- Reduces the risk of file system corruption.

Recovery Mechanisms

- On startup, NTFS replay logs to recover incomplete transactions.
- Ensures filesystem integrity and consistent state.

Advanced Features of Windows NT File System

NTFS supports numerous advanced features that enhance performance, security, and usability.

File Compression

- Allows compression of files and directories to save space.
- Transparent to users and applications.

Encryption

- Supports Encrypting File System (EFS) for data security.
- Uses public-key cryptography to encrypt file contents.

Disk Quotas

- Enable administrators to limit disk space usage per user.
- Helps manage storage resources effectively.

Sparse Files and Reparse Points

- Sparse files optimize storage by not allocating space for empty regions.
- Reparse points facilitate symbolic links, mount points, and volume management.

Performance Optimization and Caching

Windows NT optimizes disk and memory usage through caching and scheduling.

Cache Manager

- Caches frequently accessed data in RAM.
- Reduces disk I/O latency.

Prefetching and Read-Ahead

- Anticipates data needs based on access patterns.
- Improves performance during sequential reads.

I/O Scheduling

- Manages disk access requests to optimize throughput and reduce latency.
- Uses algorithms like FIFO, C-SCAN, and others.

Conclusion

The Windows NT file system internals are a sophisticated amalgamation of data structures, mechanisms, and features designed to provide efficient, secure, and reliable data management. From the core Master File Table to advanced security features and journaling, every component plays a vital role in ensuring the robustness of Windows operating systems. A thorough understanding of these internals is invaluable for system administrators, developers, and cybersecurity professionals aiming to optimize, troubleshoot, or secure Windows environments.

Keywords for SEO optimization: Windows NT file system internals, NTFS architecture, Master File Table, Data runs, Security descriptors, Journaling, File system security, Windows NT file management, NTFS features, Windows file system structure.

Windows NT File System Internals: An In-Depth Examination

The Windows NT file system internals form a complex yet highly optimized architecture that

underpins one of the most widely used operating systems globally. As the backbone of Windows NT-based platforms—including Windows 10, Windows Server, and even earlier versions—understanding how the file system operates at a low level is essential for system administrators, security professionals, developers, and researchers alike. This article aims to explore the detailed internal mechanisms of the Windows NT file system, including its architecture, data structures, and operational procedures, providing a comprehensive understanding of how Windows manages files, directories, and storage.

Introduction to Windows NT File System Architecture

The Windows NT architecture introduced a robust, modular, and scalable approach to file management, contrasting sharply with older DOS-based systems. At its core, the Windows NT file system is designed to abstract hardware details, provide security, and ensure data integrity across various storage devices. The architecture can be broadly divided into several components:

- File System Drivers (FSDs): Responsible for interfacing with specific storage media (e.g., NTFS, FAT).
- Object Manager: Manages kernel objects, including files and directories.
- Cache Manager: Implements caching strategies to optimize I/O operations.
- Memory Management: Handles buffers, caches, and buffer pools associated with file I/O.

Among the various file systems supported, NTFS (New Technology File System) is the most prevalent and sophisticated, offering features like journaling, encryption, compression, and security descriptors.

NTFS: The Heart of Windows NT File System Internals

NTFS has been the primary file system for Windows NT since its inception, designed with a focus on reliability, scalability, and advanced features.

Key Features of NTFS

- Journaling: Maintains a transaction log to recover from crashes.
- Security: Implements Access Control Lists (ACLs) and security descriptors.
- Metadata: Uses Master File Table (MFT) to track all files and directories.
- Sparse Files & Compression: Supports efficient storage.
- Encryption: Integrates with Encrypting File System (EFS).
- Disk Quotas & Sparse Files: Manage storage allocations effectively.

Master File Table (MFT): The Core Data Structure

At the heart of NTFS lies the Master File Table (MFT), a relational database that contains a record for every file and directory. Each MFT record is a fixed-size 1 KB structure, which includes:

- File Record Header: Identifies the record and its status.
- File Attributes: Metadata such as timestamps, security, and data content.
- Resident and Non-Resident Data: Data stored directly within the MFT (resident) or elsewhere on disk (non-resident).

The MFT allows for rapid access to file metadata and supports features like defragmentation, security, and recovery.

Deep Dive into NTFS Data Structures

Understanding NTFS internals necessitates a detailed look at its core data structures.

1. FILE_RECORD_HEADER

Every record in the MFT begins with this header, which contains:

- File reference number
- Sequence number
- Flags indicating the record's status (e.g., in use, deleted)
- Pointers to attribute lists

2. ATTRIBUTES

Attributes describe various aspects of files and directories, such as:

- Standard Information: Timestamps, link counts
- File Name: Unicode name, parent directory reference
- Data: Actual file contents or pointers to data
- Security Descriptor: Security information
- Object IDs: Unique identifiers for tracking

Attributes can be resident or non-resident:

- Resident: Data stored directly within the MFT record.
- Non-resident: Data stored elsewhere; the attribute contains extents pointing to data clusters.

3. Attribute List

For large files or files with multiple attributes, an attribute list attribute references additional attributes spread across the disk.

4. Indexing Structures

Directories are implemented as B+ trees, enabling efficient lookups:

- Index Root: Contains the initial part of the directory index.
- Index Allocation: Stores additional index blocks when directories grow large.
- Index Headers: Manage the structure and integrity of index nodes.

File and Directory Operations Internally

The internal operations of Windows NT's file system involve complex sequences of steps, often optimized for performance and reliability.

File Creation and Opening

- The system locates the directory's index structure.
- Searches the B+ tree for the filename.
- If not found, creates a new MFT record, allocates disk space, and updates the directory index.
- Returns a handle for further operations.

Reading and Writing Files

- The system examines the file's data attributes.
- For resident data, reads/writes are direct.
- For non-resident data, the system interprets extents and performs sequential or random disk I/O via the cache manager.

Security and Permissions Handling

- Each file/directory has a security descriptor stored as an attribute.
- Access requests are checked against ACLs.
- Security auditing and inheritance are managed through these descriptors.

Advanced Features and Internal Mechanisms

The internal workings extend beyond basic file management to include features that improve robustness and security.

1. Journaling and Crash Recovery

NTFS uses a transaction log (the journal) to record metadata changes before they are committed to disk. This ensures:

- Consistency after crashes
- Atomic updates
- Faster recovery times

2. File Compression and Encryption

- Compression alters how data extents are stored.
- EFS encrypts file data using cryptographic keys, stored securely within the security descriptors.

3. Disk Quotas and Sparse Files

- Quotas limit user storage consumption.
- Sparse files optimize storage by only allocating space for data that is actually written.

Security and Integrity at the File System Level

Security is deeply integrated into Windows NT file system internals:

- Security Descriptors: Store ACLs, owner, and group information.
- Access Tokens & Impersonation: Enforce permissions during I/O operations.
- Integrity Checks: Use checksum and journaling to verify data integrity.

While NTFS remains highly sophisticated, it faces challenges such as:

- Fragmentation affecting performance
- Security vulnerabilities at the driver level
- Compatibility issues with newer storage technologies (e.g., SSDs)

Recent developments focus on:

- Enhancing support for large disks and files
- Integrating with cloud storage solutions
- Improving resilience and recovery mechanisms

Conclusion

The Windows NT file system internals reveal a layered, resilient, and feature-rich architecture designed for high performance, security, and reliability. From its foundational data structures like the MFT and B+ trees to its advanced features such as journaling, encryption, and quotas, NTFS exemplifies a modern file system engineered for robust enterprise and consumer use. As storage technologies evolve, understanding these internals becomes vital for developers, security analysts, and system architects aiming to optimize or secure Windows-based environments.

By dissecting these internal mechanisms, professionals can better diagnose issues, develop low-level tools, and contribute to future advancements in Windows file system technology.

Question What are the main components of the Windows NT file system architecture? The main components include the NTFS driver, the Master File Table (MFT), the File Record, the Log File, the Bitmap, and the Directory Indexing structures, all working together to manage file storage, retrieval, and integrity. **How does the NTFS handle file permissions and security?** NTFS uses Access Control Lists (ACLs) embedded within file metadata to define permissions for users and groups, supporting detailed security settings, including discretionary access controls and system-level security features. **What is the Master File Table (MFT) and how does it function in NTFS?** The MFT is a central database that stores metadata about every file and directory on the volume, including attributes, security information, and data location, enabling efficient file management and access. **How does NTFS ensure data integrity and recoverability?** NTFS uses a transaction-based logging system via the USN Journal and the Log File (transaction log), which helps recover from crashes by replaying logs and maintaining consistency of the file system. **What are the differences between the NTFS Master File Table and FAT file systems?** Unlike FAT, which uses a simple File Allocation Table to track clusters, NTFS stores extensive metadata in the MFT, supports larger file sizes, improved security, journaling, and better fault tolerance. **How does NTFS handle large files and disk space management?** NTFS employs features like extents and a dynamic bitmap to efficiently manage large files and disk space, reducing fragmentation and improving performance for large data sets. **What is the role of the Master File Table Record and how is it**

structured? Each MFT record contains attributes such as file name, data, security descriptors, and timestamps; it is structured with a fixed-size record that allows quick access and updates to file metadata. How do NTFS directory structures optimize file searching and access? NTFS uses B+ trees for directory indexing, which enable fast lookup, insertion, and deletion of files within directories, greatly improving search performance especially in directories with many files.

Related keywords: Windows NT, file system, internals, NTFS, kernel mode, file management, disk management, registry, I/O subsystem, file allocation table

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