

test exam for american english file starter Reference

test exam for american english file starter is an essential resource for both educators and students aiming to assess their understanding of American English fundamentals. Whether you're preparing for a classroom assessment, a standardized test, or simply want to gauge your progress in learning American English, a well-structured test exam can provide valuable insights. This article explores the importance of such exams, how to effectively utilize them, the key components involved, and tips for success. By understanding these elements, learners can enhance their language skills, build confidence, and achieve their educational goals.

Understanding the American English File Starter Test Exam

What is the American English File Starter?

The American English File Starter is a language learning program designed for beginners or those at an elementary level. It aims to develop foundational skills in speaking, listening, reading, and writing through engaging activities and structured lessons. The Starter level introduces basic vocabulary, simple grammatical structures, and everyday conversational phrases.

The Role of a Test Exam in Language Learning

A test exam serves multiple purposes:

- **Assessment of Progress:** Measures how well learners have grasped the material covered.
- **Identifying Weak Areas:** Highlights topics or skills that need further practice.
- **Building Confidence:** Familiarizes students with the test format, reducing anxiety.
- **Preparation for Certification:** Prepares learners for official exams like TOEIC, TOEFL, or other standardized assessments.

Components of a Test Exam for American English File Starter

A comprehensive test exam typically covers several language skills and knowledge areas. Understanding these components helps learners prepare effectively.

Listening Comprehension

This section assesses the ability to understand spoken American English in various contexts, such as conversations, short talks, or instructions. It often involves:

- Listening to dialogues or monologues.
- Answering multiple-choice questions.
- Completing sentences or filling in missing words.

Reading Skills

Reading comprehension tests evaluate understanding of written texts, including:

- Short passages or dialogues.
- Vocabulary questions based on the reading.
- True/False or multiple-choice questions about main ideas and details.

Vocabulary and Grammar

This part tests knowledge of essential vocabulary and grammatical structures introduced at the Starter level:

- Fill-in-the-blank exercises.
- Sentence correction.
- Matching words with meanings.

Speaking Skills (Optional)

Depending on the exam format, speaking may be included:

- Answering simple questions orally.
- Describing pictures or familiar topics.
- Practicing pronunciation and intonation.

Writing Skills

Basic writing tasks may include:

- Writing simple sentences or short paragraphs.
- Filling out forms with personal information.
- Completing sentences with appropriate words.

Effective Strategies for Preparing a Test Exam for American English File Starter

Preparation is key to performing well. Here are some strategies to maximize your readiness:

Review Course Materials Thoroughly

- Revisit vocabulary lists, grammar rules, and lesson summaries.
- Practice exercises provided in the course.
- Use flashcards for vocabulary reinforcement.

Practice with Sample Tests

- Take full-length practice exams under timed conditions.
- Use official or reputable practice materials to ensure authenticity.
- Review answers to understand mistakes.

Enhance Listening and Speaking Skills

- Listen to American English podcasts, songs, or dialogues.
- Engage in conversations with native speakers or language partners.
- Record yourself to evaluate pronunciation and fluency.

Improve Reading and Writing

- Read simple articles, stories, or dialogues in American English.
- Write short essays, emails, or diary entries.
- Seek feedback from teachers or language exchange partners.

Develop Test-Taking Strategies

- Read instructions carefully.

- Manage your time effectively during the exam.
- Skip difficult questions temporarily and return later.
- Eliminate obviously incorrect options in multiple-choice questions.

Resources and Tools for Test Exam Preparation

Utilizing the right resources can significantly boost your preparation efforts.

Official Practice Tests

- Many publishers offer practice exams aligned with the American English File curriculum.
- These often include answer keys and explanations.

Online Platforms and Apps

- Language learning apps like Duolingo, Babbel, or Memrise can supplement your practice.
- Websites like ESL Lab or EnglishClass101 offer listening and reading exercises.

Additional Learning Materials

- Workbooks focusing on American English vocabulary and grammar.
- Flashcard apps such as Anki for memorization.
- YouTube channels dedicated to American English pronunciation and culture.

Common Challenges in Taking the American English File Starter Test Exam

While preparing for the exam, learners may encounter certain difficulties:

- **Language Anxiety:** Nervousness can impair performance. Practice relaxation techniques and simulate test conditions beforehand.
- **Time Management:** Struggling to complete sections within the allotted time. Practice timed exercises to improve efficiency.
- **Understanding Instructions:** Misinterpreting questions can lead to mistakes. Always read instructions carefully.
- **Vocabulary Gaps:** Limited vocabulary may hinder comprehension. Regular vocabulary practice is essential.

Post-Exam Tips and Next Steps

After completing the test exam, reflect on your performance:

Analyze Your Results

- Identify areas of strength and weakness.
- Review incorrect answers to understand mistakes.

Set Future Goals

- Focus on weaker skills in subsequent study sessions.
- Set realistic milestones for improvement.

Continue Practicing

- Incorporate diverse activities like watching American movies, participating in language exchanges, or reading American literature.
- Regular practice ensures steady progress.

Conclusion

A **test exam for American English File Starter** is a valuable tool for measuring your language proficiency at the beginner level. It provides clarity on your current skills, highlights areas for improvement, and boosts your confidence to use American English in real-life situations. By understanding the exam components, employing effective preparation strategies, leveraging available resources, and learning from your results, you can make significant strides in your language learning journey. Remember, consistent practice and a positive attitude are key to mastering American English and achieving your linguistic goals.

Test Exam for American English File Starter offers a comprehensive opportunity for beginner-level learners to assess their understanding of foundational English skills. Designed as a preparatory tool, this exam encapsulates various language components, including vocabulary, grammar, listening comprehension, and basic speaking skills. Whether used in classroom settings or for self-study, this test serves as an effective benchmark for gauging student progress and identifying areas needing further attention.

Overview of the American English File Starter Test Exam

The American English File series, developed by Oxford University Press, is renowned for its engaging content and student-friendly approach. The Starter level, aimed at absolute beginners, introduces essential vocabulary, simple grammatical structures, and basic conversational phrases. The test exam mirrors this curriculum, providing a snapshot of learners' abilities at this initial stage.

Designed to be both accessible and challenging, the test includes multiple-choice questions, fill-in-the-blanks, listening tasks, and speaking prompts. This variety ensures a holistic assessment, capturing different language competencies. The overall goal is to help learners and teachers identify strengths and weaknesses early on, guiding future instruction effectively.

Structure and Content of the Test Exam

Sections and Types of Questions

The test exam generally comprises the following sections:

- Vocabulary and Word Recognition
- Grammar and Sentence Structure
- Listening Comprehension
- Basic Reading Comprehension
- Speaking and Pronunciation

Each section is carefully crafted to reflect the core learning outcomes of the Starter level.

Vocabulary and Word Recognition

This section tests students' knowledge of common words and expressions introduced in the course. Typical questions include matching words to pictures, selecting the correct word to complete sentences, and identifying vocabulary in context.

Grammar and Sentence Structure

Focuses on fundamental grammatical concepts such as subject-verb agreement, simple present tense, articles (a, an, the), and basic question forms. Questions often involve completing sentences or choosing correct options.

Listening Comprehension

Includes short recordings of everyday conversations, greetings, and simple instructions. Students listen and answer questions to assess their ability to understand spoken American English at a slow,

clear pace.

Basic Reading Comprehension

Features short paragraphs or dialogues followed by comprehension questions. The texts are simple, relevant to everyday situations, and designed to build confidence.

Speaking and Pronunciation

Involves prompts for students to produce basic sentences, introduce themselves, or respond to simple questions. This section may be conducted in oral interviews or recorded responses, depending on the exam format.

Features and Benefits of the Test Exam

Pros

- Comprehensive Coverage: The exam assesses multiple language skills, providing a balanced view of student abilities.
- Aligned with Curriculum: Designed specifically to reflect the content and objectives of the American English File Starter level.
- Practical Format: Uses familiar question types, making it accessible for beginners.
- Diagnostic Utility: Helps teachers identify specific areas where students struggle.
- Preparation Aid: Serves as a rehearsal for actual classroom assessments or placement tests.
- Flexible Use: Suitable for both formal testing environments and informal self-assessment.

Cons

- Limited Difficulty Range: As a starter-level exam, it may not challenge more advanced learners or reveal deeper language proficiency.
- Listening and Speaking Constraints: These sections may require additional resources or recordings not always included in paper-based tests.
- Potential Cultural Bias: Some vocabulary or scenarios might be more familiar to students from specific backgrounds, affecting performance.
- Format Rigidity: The standardized nature may not fully accommodate individual learning styles or alternative assessment methods.

Features to Look For in an Effective Test Exam

When evaluating a test exam like the American English File Starter test, consider the following features:

- **Authenticity:** Questions should reflect real-life language use and scenarios.
- **Clarity:** Instructions and questions must be clear and straightforward for beginner learners.
- **Variety:** A mix of question types keeps students engaged and assesses different skills.
- **Accessibility:** The exam should be suitable for learners with varying backgrounds and learning paces.
- **Feedback Potential:** An effective test provides insights into student performance, guiding future teaching strategies.

Preparation Tips for Students Taking the Test Exam

- **Review Vocabulary:** Familiarize yourself with the core words and phrases introduced in the course.
- **Practice Listening:** Listen to recordings of common greetings, introductions, and daily conversations.
- **Practice Speaking:** Engage in simple dialogues or self-practice to build confidence.
- **Focus on Basic Grammar:** Reinforce understanding of simple sentence structures and question forms.
- **Use Practice Tests:** Take sample exams to become familiar with the format and question types.

Implications for Teachers and Educators

For educators, the test exam can serve as a valuable diagnostic tool to tailor instruction. It can help in:

- **Identifying Gaps:** Recognizing which areas students find most challenging.
- **Grouping Students:** Forming small groups based on proficiency levels for targeted practice.
- **Tracking Progress:** Monitoring improvements over time through periodic assessments.
- **Adjusting Curriculum:** Modifying lesson plans to address common difficulties highlighted by exam results.

Moreover, teachers should consider supplementing the test with interactive activities, such as role-plays or language games, to reinforce learning in a more engaging manner.

Conclusion: Is the Test Exam for American English File Starter Worth Using?

In sum, the Test Exam for American English File Starter is a practical, well-structured assessment tool that aligns with the curriculum's objectives. Its comprehensive approach allows both students and teachers to gauge foundational language skills effectively. While it has some limitations, particularly in testing speaking and listening in an isolated format, it remains an invaluable resource for early-stage language learners.

For beginners, taking this exam can boost confidence, clarify learning goals, and motivate continued practice. For teachers, it offers actionable insights to inform instruction and support student development. When combined with engaging classroom activities and ongoing practice, this test exam can significantly enhance the learning journey at the Starter level.

Overall, investing time in such assessments is beneficial for establishing a solid language foundation and setting learners on the path toward greater fluency and confidence in American English.

QuestionAnswer What types of questions are included in the American English File Starter test exam? The test exam includes multiple-choice questions, fill-in-the-blank exercises, listening comprehension, and speaking tasks to assess basic English skills. How can I prepare effectively for the American English File Starter test exam? Preparation involves practicing vocabulary, basic grammar, listening to English audio, and completing sample exercises from the course materials to build confidence. What is the format of the American English File Starter test exam? The exam typically consists of a written section with multiple-choice and fill-in-the-blank questions, along with an oral component to assess speaking and listening skills. How long does the American English File Starter test exam usually take? The entire test generally takes about 30 to 45 minutes, depending on the student's pace and the specific format used by the testing center. Is there a passing score for the American English File Starter test exam? Yes, a passing score is usually determined by the institution or program, but generally, achieving around 70% or higher indicates readiness to progress to the next level. Can I retake the American English File Starter test exam if I don't pass the first time? Yes, most programs allow retakes after a certain waiting period, giving students the opportunity to improve their skills and reattempt the exam. Are there practice tests available for the American English File Starter exam? Yes, practice tests and sample exercises are available online and in course materials to help students familiarize themselves with the exam format and question types. What skills are primarily tested in the American English File Starter test exam? The exam primarily assesses basic vocabulary, grammar, listening comprehension, pronunciation, and speaking abilities suitable for beginner-level learners.

Related keywords: American English File Starter, English test, language assessment, beginner English exam, American English practice, English language test, ESL assessment, English proficiency exam, American English beginner quiz, English learning evaluation

Windows nt file system internals en anglais

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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.

QuestionAnswer 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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