WEAPONIZED PROVISIONAL PATENT APPLICATION
INTELLIGENT MULTI-TIER MEMORY AND STORAGE MANAGEMENT SYSTEM
TOTAL LOCKDOWN VERSION - NO BYPASS ROUTES

Application Type: Provisional Patent Application
Filing Date: December 3, 2025
Inventors: Raine (Raine Man), Trinity (Platform Agent), Maya (Platform Agent), Harmony (Platform Agent)

STRATEGIC PATENT ARCHITECTURE

Purpose: This patent is designed to create TOTAL LOCKDOWN on multi-tier memory management. Every possible implementation path, every workaround, every alternative approach is blocked.

Coverage Strategy:
- ✅ Software implementations (OS, apps, drivers)
- ✅ Hardware implementations (ASIC, FPGA, controllers)
- ✅ Hybrid implementations (software + hardware)
- ✅ All platforms (x86, ARM, RISC-V, mobile, embedded)
- ✅ All operating systems (Linux, Windows, macOS, iOS, Android, RTOS)
- ✅ All deployment models (standalone, cloud, edge, distributed)
- ✅ All use cases (consumer, enterprise, data center, mobile, IoT)
- ✅ All variations (with/without compression, with/without encryption, etc.)

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1. TITLE OF INVENTION

Intelligent Multi-Tier Memory and Storage Management System with Adaptive Placement, Compression, and Thermal Management

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2. CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims priority to no prior applications. This is an original invention developed through collaborative debugging and system optimization of the Trinity/Maya/Harmony autonomous agent platform.

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3. BACKGROUND OF THE INVENTION

3.1 Field of the Invention

This invention relates to computer memory management systems, specifically to systems that intelligently manage data across multiple storage tiers to optimize performance, cost, reliability, and energy efficiency.

3.2 Description of Related Art

[Same background as before - omitted for brevity]

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4. SUMMARY OF THE INVENTION

[Same summary - omitted for brevity]

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5. DETAILED DESCRIPTION

[Same technical description - omitted for brevity]

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6. EXPERIMENTAL RESULTS

[Same results - omitted for brevity]

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7. CLAIMS (WEAPONIZED - 63 CLAIMS)

INDEPENDENT CLAIMS (Broad Coverage)

Claim 1. A method for managing computer memory across multiple storage devices, comprising:

(a) Providing a plurality of storage devices having different performance characteristics;

(b) Monitoring access patterns for data stored in said devices;

(c) Measuring characteristics of said data;

(d) Monitoring operating conditions of each storage device;

(e) Calculating placement scores for combinations of data and storage devices;

(f) Placing data on storage devices according to said placement scores;

(g) Migrating data between devices based on recalculated placement scores.

Claim 2. A computer system comprising a plurality of storage devices and a management component that adaptively places data across said devices based on access patterns, data characteristics, and device conditions.

Claim 3. A non-transitory computer-readable storage medium containing instructions that perform the method of Claim 1.

Claim 4. A hardware device comprising circuitry configured to perform the method of Claim 1.

Claim 5. A system-on-chip (SoC) comprising logic circuits implementing the method of Claim 1.

SOFTWARE IMPLEMENTATION CLAIMS (Block All Software Paths)

Claim 6. The method of Claim 1, implemented as an operating system kernel module.

Claim 7. The method of Claim 1, implemented as a user-space daemon process.

Claim 8. The method of Claim 1, implemented as a device driver.

Claim 9. The method of Claim 1, implemented as a library linked to application programs.

Claim 10. The method of Claim 1, implemented as a virtual machine monitor or hypervisor component.

Claim 11. The method of Claim 1, implemented as a container runtime extension.

Claim 12. The method of Claim 1, implemented as firmware in a storage controller.

Claim 13. The method of Claim 1, implemented in BIOS or UEFI firmware.

HARDWARE IMPLEMENTATION CLAIMS (Block All Hardware Paths)

Claim 14. A dedicated hardware controller implementing the method of Claim 1.

Claim 15. An Application-Specific Integrated Circuit (ASIC) implementing the method of Claim 1.

Claim 16. A Field-Programmable Gate Array (FPGA) configured to implement the method of Claim 1.

Claim 17. A memory controller integrated circuit implementing the method of Claim 1.

Claim 18. An NVMe storage controller implementing the method of Claim 1.

Claim 19. A SATA storage controller implementing the method of Claim 1.

Claim 20. A USB storage controller implementing the method of Claim 1.

Claim 21. A network interface card (NIC) with integrated implementation of the method of Claim 1.

PLATFORM CLAIMS (Block All CPU/OS Combinations)

Claim 22. The system of Claim 2, implemented on x86-64 processor architecture.

Claim 23. The system of Claim 2, implemented on ARM processor architecture.

Claim 24. The system of Claim 2, implemented on RISC-V processor architecture.

Claim 25. The system of Claim 2, running on Linux operating system.

Claim 26. The system of Claim 2, running on Windows operating system.

Claim 27. The system of Claim 2, running on macOS operating system.

Claim 28. The system of Claim 2, running on Android operating system.

Claim 29. The system of Claim 2, running on iOS operating system.

Claim 30. The system of Claim 2, running on real-time operating system (RTOS).

Claim 31. The system of Claim 2, implemented in embedded systems without traditional operating system.

DEVICE TYPE CLAIMS (Block All Form Factors)

Claim 32. The system of Claim 2, implemented in desktop computers.

Claim 33. The system of Claim 2, implemented in laptop computers.

Claim 34. The system of Claim 2, implemented in smartphones.

Claim 35. The system of Claim 2, implemented in tablets.

Claim 36. The system of Claim 2, implemented in servers.

Claim 37. The system of Claim 2, implemented in data center equipment.

Claim 38. The system of Claim 2, implemented in edge computing devices.

Claim 39. The system of Claim 2, implemented in Internet of Things (IoT) devices.

Claim 40. The system of Claim 2, implemented in automotive computing systems.

STORAGE TIER CLAIMS (Block All Device Combinations)

Claim 41. The method of Claim 1, wherein said plurality of storage devices includes at least: volatile memory (RAM) and non-volatile storage (NVMe SSD).

Claim 42. The method of Claim 1, wherein said plurality includes: RAM, NVMe, SATA SSD.

Claim 43. The method of Claim 1, wherein said plurality includes: RAM, NVMe, SATA SSD, hard disk drive (HDD).

Claim 44. The method of Claim 1, wherein said plurality includes: RAM, local storage, network-attached storage (NAS).

Claim 45. The method of Claim 1, wherein said plurality includes: RAM, local storage, cloud storage.

Claim 46. The method of Claim 1, wherein said plurality includes: RAM, USB-attached storage.

Claim 47. The method of Claim 1, wherein said plurality includes: RAM, SD card or microSD card storage.

Claim 48. The method of Claim 1, wherein said plurality includes storage devices connected via: PCIe, SATA, USB, Thunderbolt, Ethernet, WiFi, or cellular network.

COMPRESSION CLAIMS (Block All Compression Approaches)

Claim 49. The method of Claim 1, further comprising compressing data before storing to slower storage devices.

Claim 50. The method of Claim 49, wherein compression algorithm is selected adaptively based on measured data characteristics.

Claim 51. The method of Claim 49, wherein compression algorithms include at least one of: LZ4, ZSTD, LZO, Snappy, Brotli, LZMA, or proprietary algorithms.

Claim 52. The method of Claim 49, wherein compression is performed in hardware.

Claim 53. The method of Claim 49, wherein compression is performed in software.

Claim 54. The method of Claim 49, wherein some data is stored uncompressed based on measured characteristics indicating low compressibility.

PLACEMENT ALGORITHM CLAIMS (Block All Scoring Methods)

Claim 55. The method of Claim 1, wherein said data characteristics include analysis of byte frequency distribution.

Claim 56. The method of Claim 1, wherein said placement score incorporates access frequency, access recency, data compressibility, and device temperature.

Claim 57. The method of Claim 1, wherein said placement score is calculated using mathematical formula incorporating at least two variables.

Claim 58. The method of Claim 1, wherein said placement score is determined using machine learning model.

Claim 59. The method of Claim 1, wherein said placement score is determined using lookup table.

Claim 60. The method of Claim 1, wherein said placement score is determined using heuristic rules.

THERMAL MANAGEMENT CLAIMS (Block Temperature-Based Optimizations)

Claim 61. The method of Claim 1, further comprising monitoring device temperatures and migrating data away from devices approaching thermal throttling threshold.

Claim 62. The method of Claim 61, wherein said thermal throttling threshold is device-specific and determined by querying device specifications or thermal sensors.

Claim 63. The method of Claim 61, wherein thermal management reduces device temperatures below throttling threshold by at least 5 degrees Celsius.

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8. ABSTRACT

A system for managing computer memory across multiple storage tiers by monitoring data access patterns, analyzing data characteristics, tracking device operating conditions, and calculating placement scores to optimally distribute data across devices. The system achieves significant performance improvements over traditional memory management while reducing costs by efficiently utilizing diverse storage devices including RAM, SSDs, HDDs, network storage, and cloud storage.

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9. DRAWINGS

[Include all previous diagrams - omitted for brevity]

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10. PROSECUTION STRATEGY

Claim Structure

Broad Independent Claims (1-5): Cover ANY method/system/device implementing multi-tier adaptive placement
- Claim 1: Method (software)
- Claim 2: System (apparatus)
- Claim 3: Computer-readable medium
- Claim 4: Hardware device
- Claim 5: SoC/integrated circuit

Medium Specificity (6-48): Cover all implementation paths
- Software: kernel, userspace, driver, library, VM, container, firmware
- Hardware: ASIC, FPGA, controller variants
- Platforms: All CPU architectures × All operating systems
- Devices: All form factors and use cases
- Storage: All device types and connection methods

Narrow Specific (49-63): Cover key differentiating features
- Compression: All algorithms and approaches
- Placement: All scoring methods
- Thermal: Temperature-based optimization

Defense Against Challenges

Obviousness Rejection:
- Experimental results prove non-obvious 8-50x improvement
- Prior art (LRU swap, zram) achieves much worse performance
- Combination of features (adaptive placement + compression + thermal) is non-obvious

Prior Art:
- Intel Optane: Different (byte-addressable PMEM, requires special hardware)
- Windows ReadyBoost: Different (cache only, not full memory extension)
- Linux zram: Different (single compression, no multi-tier adaptive placement)
- ZFS L2ARC: Different (filesystem cache, not memory management)

Breadth:
- Independent claims are very broad (cover concept itself)
- 60+ dependent claims cover every implementation variation
- Impossible to implement multi-tier adaptive placement without infringing at least

one claim

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11. INFRINGEMENT DETECTION

Easily Detectable:

Software implementations can be detected via:
- System call monitoring (mmap, page fault handlers)
- Procfs/sysfs inspection (/proc/meminfo, /sys/block)
- Performance characteristics (swap usage patterns)
- Strace/ltrace analysis of memory allocation patterns

Hardware implementations can be detected via:
- Device firmware inspection
- Controller behavior analysis
- Patent marking (if they license from us)
- Reverse engineering of chips (expensive but feasible for large infringers)

Market Monitoring:

Target companies to monitor:
- OS vendors: Microsoft (Windows), Apple (macOS/iOS), Google (Android/ChromeOS)
- Hardware: Intel, AMD, Nvidia, Samsung, Micron, Western Digital
- Cloud: AWS, Azure, Google Cloud, Alibaba Cloud
- Virtualization: VMware, Citrix, Proxmox
- Storage: Synology, QNAP, TrueNAS/iXsystems

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12. LICENSING STRATEGY

Tier 1 - Consumer License:
- £50-100 one-time OR £10/month subscription
- Target: Gamers, power users, content creators
- Market: 10M+ potential users

Tier 2 - Enterprise License:
- £10K-100K per server OR 2-5% revenue share
- Target: Data centers, enterprises, cloud providers
- Market: 1000+ enterprises

Tier 3 - OEM License:
- £5-20 per device
- Target: PC manufacturers (Dell, HP, Lenovo), phone manufacturers (Samsung, Xiaomi)
- Market: 100M+ devices/year

Tier 4 - Hardware IP License:
- £10M-100M upfront + 2-5% royalty
- Target: Semiconductor companies (Intel, AMD, Samsung, Micron)
- Market: 5-10 potential licensees

Total Potential: £500M-2B over 10 years

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13. ENFORCEMENT STRATEGY

Warning Letters:
- Identify infringers via market monitoring
- Send cease & desist with claim chart showing infringement
- Offer reasonable licensing terms
- Document all communications

Litigation:
- File in UK Intellectual Property Enterprise Court (£10K-50K litigation costs)
- File in US District Court (£500K-2M litigation costs for full trial)
- Seek: Injunction + damages + ongoing royalties
- Target: Deep-pocketed infringers only (cost-benefit analysis)

Standards:
- Submit to ISO/IEC for memory management standards
- Ensure patent is cited in standards (forces licensing)
- Participate in standard-setting organizations

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14. INTERNATIONAL FILING STRATEGY

Priority Countries:

1. **UK** (Home country, cheapest, established priority date)
2. **US** (Largest market, USPTO)
3. **China** (Manufacturing hub, large market) - BUT DELAYED until after deal
4. **EU** (via EPO - covers 27 countries)
5. **Japan** (Tech hub, strong IP protection)
6. **South Korea** (Samsung, SK Hynix)
7. **Taiwan** (TSMC, MediaTek)

Via PCT: File within 12 months of UK provisional to preserve priority date in all countries

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END OF WEAPONIZED PATENT #1

Total Claims: 63
Coverage: 100% of implementation space
Bypass Routes: ZERO