

OPEN, CONVERGED, AGILE AND RELIABLE HUAWEI FUSIONSHERE MAKES CLOUD COMPUTING SIMPLER 開放兼容 敏捷可靠 華為 FUSIONSHERE 操作系統簡化雲端運算

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Competitive and Strong Performance of FusionSphere Cloud OS

FusionSphere is a cloud operating system designed by Huawei to help enterprises in different industries overcome the challenges of IT transformation. It offers powerful virtualization and resource pool management functions, comprehensive cloud infrastructure components and tools, and open application programming interfaces (APIs). An open, converged, agile and reliable OS helps enterprises and carriers integrate and optimize their data centers and service platforms, improving reliability, agility, and efficiency.

With FusionSphere, enterprises and carriers can more efficiently deploy server virtualization, as well as private, public, and hybrid cloud services. The OS helps enterprises to horizontally consolidate physical and virtual resources in data centers and to vertically optimize service platforms, facilitating the construction and use of cloud computing platforms. It allows them to build software-defined data center capabilities, encompassing storage (SDS), networking (SDN), and automated management. FusionSphere also supports commercial use of cloud-based telecom services through network function virtualization (NFV).

Delivering flexibility and choice, FusionSphere is based on OpenStack architecture, allowing enterprises to use standard hardware, software, and APIs and other third-party computing, storage, network, and virtualization products and services.

FusionSphere Features

Open

- Based on OpenStack architecture, it allows private and public clouds to be interconnected.
- Supports heterogeneous virtualization and protects customers' investments.
- Supports more than 5,000 applications and encourages cooperation throughout the industry chain.
- Simplifies integration of third-party systems and secondary development with the Huawei eSDK.

Converged

- Centrally manages virtual machines (VMs) and physical servers, making service deployment more flexible.
- Supports centralized management of multiple data centers (DCs) across regions and cascading of up to 100 DCs.
- Centrally manages software and hardware resources, and efficiently dispatches resources.

最具競爭力及表現強勁的雲作業系統 FusionSphere

華為推出FusionSphere雲端運算操作系統，幫助各行各業的客戶克服IT轉型帶來的挑戰。產品專為設計和優化雲端系統，提供強大的虛擬化功能和資源池管理、豐富的雲端基礎服務元件和工具、開放的API介面等。華為FusionSphere操作系統以開放、兼容和可靠的操作系統，幫助企業和電訊商整合和優化數據中心和業務平台，讓企業的雲端運算更可靠、敏捷和高效。

通過使用華為FusionSphere操作系統，企業和電訊商客戶能夠隨著公司需求部署伺服器虛擬化、私有雲、公用雲以及混合雲業務，橫向地整合數據中心的實體和虛擬資源，從而垂直優化業務平台，促進雲端運算平台的建設和應用。客戶能藉此構築更完整的軟件定義數據中心能力（含軟件定義存儲、軟件定義網絡等）和更強的管理自動化能力，並能支援電訊業務雲端化商用能力（NFV，網絡功能虛擬化）。

FusionSphere操作系統基於OpenStack架構，提供更多靈活性和選擇性，讓企業採用標準的硬件、軟件和API等第三方運算、存儲、網絡和虛擬化的產品和服務。

FusionSphere操作系統特點

開放

- 基於OpenStack開放架構，容許私有雲和公用雲的互聯互通
- 支援異構虛擬化，保護客戶投資
- 支援超過5,000份應用驗證申請，鼓勵產業鏈合作
- 華為eSDK簡化第三方系統集成和二次開發

兼容

- 統一管理虛擬機器和實體伺服器，讓業務部署更靈活
- 支援跨地域多中心的統一管理，連結起多達100個數據中心
- 統一管理軟件和硬件資源，提升資源調度效率

Reliable

- Supports hardware failure detection and HA (High Availability) triggered service switchover within milliseconds.
- Zeros out each physical bit on logical volumes to completely delete user information.
- Uses an agent-free antivirus mechanism to effectively reduce VM performance loss.
- Supports TPM2.0 international specifications, meeting compliance requirements.

Global Agility and Industry-Leading Performance

As of the end of August 2016, Huawei had deployed more than 2 million virtual machines and established 830 data centers worldwide, including 420 cloud data centers. Relied on around the world, Huawei FusionSphere is already used in a wide variety of fields including government, public utilities, telecommunication, energy, finance, transportation, health care, education, media, manufacturing and other industries.

Huawei was named a strong performer in The Forrester Wave™: Private Cloud Software Suites, Q1 2016 report produced by Forrester Research Inc. This acknowledges the functionality, performance, and cost-effectiveness of the FusionSphere OS.

Compatible Architecture

Based on OpenStack architecture, Huawei FusionSphere helps enterprises efficiently use existing resources while supporting long-term evolution. It allows enterprises and carriers to deploy private, public, and hybrid cloud services, as required. It also offers extended services, including backup, disaster recovery, live migration, resource dispatching across DCs, telecom custom cloud expansion services, elastic service dispatching, smart channel dispatching, distributed engines, and physical resource pools.

Industry-Leading Performance

With a bare-metal virtualization engine, FusionSphere consumes less than 5% of physical CPU resources, improves server utilization by up to 80%, and reduces IT infrastructure deployment costs by over 30%.

The SPECvirt test confirms FusionSphere's superior performance against other leading virtualization solutions. FusionSphere uses high-performance, distributed storage virtualization software that delivers data reconstruction time of less than 30 minutes per TB data and multiple-disk concurrency that offers a ten-fold improvement in IOPS. Huawei FusionSphere meets carrier requirements for base station controller virtualization latency of less than 20µs, which is much lower than mainstream latency levels.

Reliable Services

IT services deployed on the FusionSphere virtualization platform make use of the high-availability, fault tolerance, and active-active data center capabilities of FusionSphere to implement disaster

可靠

- 支援毫秒級硬件故障檢測，實現高可用性的保護倒換
- 以獨有物理Bit清零模式，徹底清除使用者資訊
- 採用無代理的防禦病毒機制，有效降低虛擬機器性能損耗
- 支援TPM2.0的國際可信規範，滿足合規性要求

全球敏捷性和業界領先的性能

截至2016年8月底，華為在全球已部署超過200萬台虛擬機器和830個數據中心，其中包括420個雲端數據中心。政府及公共事業、電訊、能源、金融、交通、醫療、教育、媒資、製造等各行業客戶均採用FusionSphere操作系統。

在2016年第一季度發布的「The Forrester Wave™：全球私有雲端軟件套件報告」中，華為被指表現強勁，充分認可FusionSphere操作系統的功能，性能和成本效益。

架構開放兼容

FusionSphere操作系統基於OpenStack架構，讓企業客戶有效採用現有資源，且能支援長期演進。這系統也提供備份與容災、實時遷移、跨數據中心的資源調度、電訊定制雲端化擴展、業務彈性調度、智能渠道調度、分散式引擎、物理資源池等擴展服務，滿足企業隨需部署私有雲、公用雲和混合雲業務。

性能業界領先

FusionSphere操作系統為裸金屬架構的虛擬化引擎，對物理CPU資源的損耗小於5%，顯著提升伺服器資源利用率高達80%，減少IT部署成本達30%以上。

業界虛擬化標準SPECvirt測試證明，FusionSphere操作系統的性能比業界其他領先的虛擬化解決方案優勝。FusionSphere操作系統使用高效的分佈式存儲虛擬化軟件，能於少於30分鐘內重建多達1 TB的數據，其多盤併發能力也提升IOPS性能高達十倍。FusionSphere操作系統同時能滿足電訊商業務中基站控制器對虛擬化引入的時延少於20us的極高要求，遠低於業界主流虛擬化引入的時延水準。

業務安全可靠

安裝在FusionSphere操作系統虛擬化平台上的IT服務，可以透過平台構建的高可用性、容錯以及雙活數據中心等能力，實現業務的容災和備份，降低企業業務容災的成本。例如，FusionSphere操作系統的實時遷移功能可實現不中斷業務的系統升級和例行維護，而健康檢查工具和系統運行記錄儀功能可以實現完備可作故障預警和意外出現後的故障快速定位。

recovery (DR) and backup functions, thereby reducing DR costs for enterprises. For example, FusionSphere's live migration feature manages in-service system upgrades and routine maintenance, while the health check tool and system running recorder issue early warnings and locate faults.

Furthermore, FusionSphere relies on proven computing and data disk encryption features to protect data from interception and ensure security. FusionSphere is the only cloud platform in the industry with 99.999% reliability.

Efficient Operation

The efficiency of any cloud OS depends on how the system is operated by the customer's in-house IT team. Huawei FusionSphere provides visual templates that help enterprises simplify cloud computing operations. These templates allow enterprise IT teams to create virtual data centers within 10 minutes and to implement one-click application deployment and highly effective operation and maintenance (O&M) procedures.



另外，FusionSphere操作系統採用可信運算和數據磁盤加密功，能防禦數據攔截和確保安全性，是在行業中唯一具有99.999%可靠性的雲端平台。

運營敏捷高效

一個雲端運業系統的效率能否發揮到最高質素，取決於客戶的內部IT團隊的操作方法。華為FusionSphere操作系統能夠讓客戶利用視覺化模版，幫助企業在10分鐘內創建虛擬數據中心，實現一鍵式應用部署和高效運維，使雲端運算在變得簡捷高效。