



Data Sheet

Cisco VFrame Server Fabric Virtualization Software 3.1

Cisco® VFrame Server Fabric Virtualization Software 3.1 provides server and I/O virtualization capabilities in the data center. It dramatically reduces data center costs through server and I/O consolidation and increases operational efficiency through policy-based automated provisioning of servers and their associated network and storage.

PRODUCT OVERVIEW

Cisco VFrame Server Fabric Virtualization Software 3.1 is a data center automation tool that provides flexibility to industry-standard server environments and their associated input/output (I/O) interfaces. Cisco VFrame software programs and coordinates Cisco server fabric switches to dynamically change how a server is provisioned by mapping a physical server to a logical server identity stored in the fabric, complete with virtual I/O subsystem. Cisco VFrame software is part of the Cisco VFrame solution that interconnects servers into a high-speed unified fabric with shared I/O.

KEY FEATURES AND BENEFITS

Cisco VFrame Server Fabric Virtualization Software 3.1 offers the following benefits to data center administrators.

Rapid Server Deployment

Cisco VFrame software enables rapid service deployment by transforming servers into pools of reconfigurable, diskless servers. At the core of the Cisco VFrame solution is the programmable Cisco SFS 3012 Multifabric Server Switch. The Cisco VFrame solution connects every server through InfiniBand, a single high-speed unified fabric, and then maps the physical server (now a simplified CPU and memory resource only) to a remote, virtual I/O subsystem and network storage. By booting from network storage and unifying I/O with virtual I/O subsystems, Cisco VFrame software gives a server the flexibility to be re-provisioned quickly. The software programs each server switch to change the resources to which a diskless server is mapped, allowing a physical device to take on another identity quickly. Cisco VFrame software can deploy and repurpose physical resources based on business policies such as time of day, failover, or different types of load.

Quick Return on Investment

The Cisco VFrame solution delivers return on investment (ROI) through resource consolidation. The server switch creates a unified, wire-once fabric that greatly simplifies the data center architecture by aggregating I/O and server resources. Multiple types of I/O cards, including host bus adapters (HBAs), network interface cards (NICs), and dedicated cluster cards can be combined into a single high-speed, low-latency, 10-Gbps InfiniBand fabric. By creating virtual HBAs and IP interfaces in each server, administrators maintain easy access to SANs and LANs, while reducing the expensive overhead of Fibre Channel HBAs. This consolidation reduces the number of expansion slots and enables the ability to architect based on average load across multiple servers, not peak demand. By aggregating multiple adapters and eliminating local storage, the size of the server is determined by CPU and memory requirements only. This often results in a reduction in the size and cost of the server, as well as associated space, power, and cooling.

Virtualizing I/O on the server also allows multiple servers to be shared by different applications by enabling the ability to rapidly change server identities. By simply changing the server-to-storage mappings stored in the server switch, physical machines can switch between different operating systems and applications. The server's identity is stored in the fabric, and the physical server is simply another resource to be used regardless of physical location. Administrators can create business policies in Cisco VFrame software that repurpose servers based on time of day, CPU or application load, or other metrics. For example, in a clustered database or Web server environment, this allows a group of physical server devices to be added during peak hours, and released during less busy times. Alternatively, a group of

servers can be shared across multiple applications for N+1 failover, eliminating the need to dedicate unused standby servers for every application.

Lower Total Cost of Ownership

Cisco VFrame software can reduce total cost of ownership (TCO) by allowing central management of server resources within the data center. In addition to providing capital savings by reducing the size and number of required servers through just-in-time provisioning, it reduces operational costs by automating regular tasks. Cisco VFrame software saves management time by increasing the number of servers an individual administrator can manage. It shortens the time to bring new resources online, and eliminates the need to physically touch or rewire servers to change how resources are assigned. The server architecture is dramatically simplified, with fewer interfaces per server and less complexity, as well as a lower failure and replacement rate due to fewer moving parts with the removal of local storage.

Reduced Server Downtime

The Cisco VFrame solution's flexibility and centralized management model significantly reduce server downtime. By booting remotely over the network to a centralized SAN or LAN, administrators can improve mean time between failures (MTBF) of servers by eliminating the single most common point of failure: local storage. With a unified fabric, administrators also eliminate extra adapters, thereby reducing associated cabling and simplifying the server. Administrators can then manage storage and I/O upgrades centrally, performing migrations and changes without bringing down applications for significant periods of time. For example, administrators can change which physical hardware a "virtual server" is running on with one click in the Cisco VFrame software user interface, which changes the mapping in the server switch and brings up the same virtual server stored in the fabric with different physical hardware.

Physical virtualization enables both service migration and failover. If the old hardware becomes problematic, administrators can proactively migrate to new hardware, while maintaining the existing server image and I/O settings. Conversely, administrators can build an updated image offline and migrate the physical hardware to a new image. Or if a server fails, Cisco VFrame software can detect the physical hardware fault and automatically migrate that server identity to a new location, choosing the replacement from a shared failover pool. Similarly, I/O virtualization enables the administrator to centrally expand or service centralized I/O without affecting server uptime.

Efficient Use of Resources

The Cisco VFrame solution helps control spending on real estate, power, and cooling by capitalizing on dense server packaging and blade architectures.

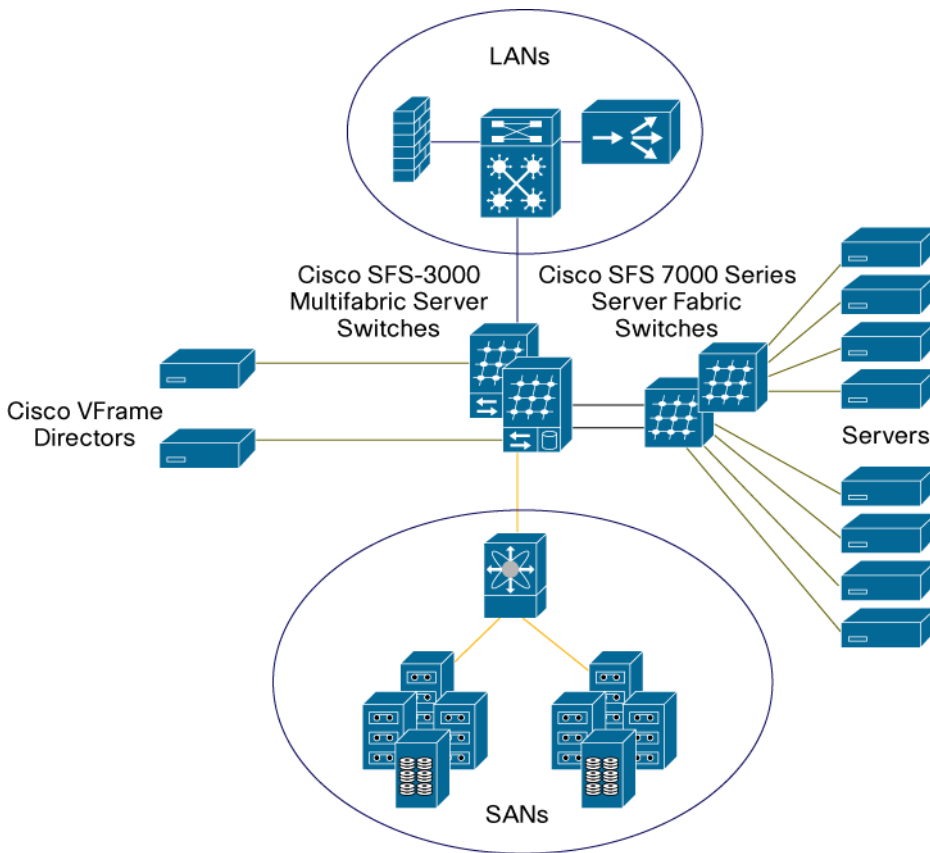
Virtual I/O also eliminates I/O deficiencies or bottlenecks in dense server packaging. I/O is particularly an issue in blade servers, where multiple blades in a chassis create more I/O than the outbound pipes can sustain. In the traditional model, blades share a few common Fibre Channel and Ethernet ports at the blade chassis level. In the virtual I/O model, all blades are connected through a 10-Gbps network "backplane" and use common external Fibre Channel and Ethernet ports, which can be scaled linearly by adding additional expansion modules. This kind of expansion is simply not possible in the previous model with limited space for multiple adapters, resulting in I/O bottlenecks that can prevent enterprise-class applications from being deployed. With today's leading blade solutions, switching to an architecture based on virtual I/O significantly improves the amount of aggregate I/O coming out of the chassis. Similarly, this also frees other dense server packages from their architectural constraints resulting from the lack of I/O expansion slots.

PRODUCT ARCHITECTURE

The Cisco VFrame 3.1 solution (Figure 1) has two components:

- Cisco VFrame Server Fabric Virtualization Software 3.1
- Cisco SFS 3000 Series Multifabric Server Switches and Cisco SFS 7000 Series Server Fabric Switches

Figure 1. Cisco VFrame Software and Server Fabric Switch Connectivity



The Cisco SFS switching fabric provides servers with a low-latency, 10-Gbps interconnect. Cisco VFrame software defines a virtual server on the network which has a collection of requirements such as CPU, memory, I/O capacity, and OS. By programming the Fiber Channel and Ethernet gateways on the Cisco SFS 3000 Series switches, Cisco VFrame software maps the physical servers to virtual servers. The software can remotely boot the Cisco SFS connected servers with boot images stored in the SAN fabric. Through customer-configured policies, Cisco VFrame software can provide dynamic failover, load- and time-based server addition and deletion, and I/O management. Table 1 lists the primary features of Cisco VFrame Server Fabric Virtualization Software 3.1.

Table 1. Features Table

Feature	Description
Physical server virtualization	Cisco VFrame software enables administrators to deploy pools of stateless, anonymous servers that can be dynamically assigned to pre-provisioned server images, called "virtual servers." The software creates this virtual server independently of the physical server by storing the OS image and virtual I/O subsystem (Worldwide Name [WWN] for storage and IP address) in the fabric. This virtual server can be mapped to physical resources using the Cisco VFrame software GUI.
Virtual I/O	With the creation of virtual IP interfaces and HBAs on the host and mapping them to gateway ports on the InfiniBand-to-Ethernet and InfiniBand-to-Fiber Channel gateways, Cisco VFrame software can dynamically allocate I/O capability to a virtual server, and can centrally manage that I/O resource, including resizing available I/O bandwidth without affecting servers.
Image management	Cisco VFrame software maintains a library of golden images for Windows 2000/2003 and Red Hat or SUSE Linux operating systems and Solaris 10 on x86 hardware. These generic golden images can be created by installing the OS the conventional way or by taking a snapshot of an existing running server.
Business policy	Through a combination of triggers and actions, Cisco VFrame software provides the capability to add, remove, fail over, and reassign virtual servers based on application needs or physical server health. Using these policies, administrators can share generic pools of failover servers across multiple applications, dynamically allocate servers based on changing demand, and quickly provision and migrate servers.

Feature	Description
High availability	Cisco VFrame software is available in high-availability mode, where two servers can be deployed to provide coordinated failover in the event of a VFrame server failure. In a critical data center environment, this provides vital continuity for server management.
Power management	Cisco VFrame software supports a management interface that can communicate with all major power-management schemes offered by server partners through their out-of-band management interfaces. It uses these interfaces over a management network to control how a server boots and reboots.
Discovery	Cisco VFrame software works with the InfiniBand subnet manager to dynamically discover servers that are plugged into the server fabric. The software presents the unique ID of the discovered servers, switch port location, and available physical servers in the resource pool.
Monitoring	Cisco VFrame software monitors a range of variables available from servers such as CPU or memory load, and is capable of creating triggers for business policies based on changes to those variables. Cisco VFrame software can monitor via standard Simple Network Management Protocol (SNMP) agents, network alerts, or XML for external integration.
Troubleshooting	Cisco VFrame software provides two interfaces for troubleshooting operations: a GUI-based event manager that displays all major system events, and log files in standard syslog format.
Security	Cisco VFrame software supports secure authentication and file transfer protocols including Secure Shell (SSH) Protocol, HTTPS, Secure Copy (SCP), and SNMPv3. Virtual server groups can be mapped to InfiniBand partitions within the server fabric. This functionality allows secure isolation of virtual server groups from one another.
Third-party integration	Through standard interfaces such as SNMP and XML, Cisco VFrame software can integrate with third-party management tools in the data center, allowing customers to maintain their operational model.

SYSTEM REQUIREMENTS

Table 2 lists the hardware supported by Cisco VFrame Server Fabric Virtualization Software 3.1. Table 3 lists the system requirements, and Table 4 lists the supported server operating systems.

Table 2. Supported Hardware

Cisco SFS 3000 Series Multifabric Server Switches
Cisco SFS 3000 Series InfiniBand-to-Ethernet Gateway Module
Cisco SFS 3000 Series InfiniBand-to-Fiber Channel Gateway Module
Cisco SFS 7000 Series InfiniBand Server Switches

Table 3. System Requirements

Server CPU	Intel Xeon, Nacona, or AMD Opteron-based processor
Memory	1 GB internal memory
Network Interface	Cisco InfiniBand Host Channel Adapter, 10 Gbps
Operating System	Red Hat Enterprise Linux 3 Update 7

Table 4. Supported Operating Systems

Red Hat Enterprise Linux Server 3.0, Red Hat Enterprise Linux Server 4.0
SUSE Linux Enterprise Server 9
Windows 2000 Server, Windows 2000 Advanced Server
Windows 2003 Server, Standard or Enterprise Editions
Sun Solaris 10 on x86 platforms

ORDERING INFORMATION

To place an order, visit the [Cisco Ordering Home Page](#). Table 5 lists ordering information for Cisco VFrame Server Fabric Virtualization Software 3.1.

Table 5. Ordering Information

Product Name	Part Number
Cisco VFrame Server Fabric Virtualization Software 3.1, base image and 10-node license	SV-VF31-BASE+10-K9
Cisco VFrame Server Fabric Virtualization Software 3.1, high-availability image	SV-VF31-HA-K9
Cisco VFrame Server Fabric Virtualization Software 3.1, one additional node license	LIC-SV-VF31-K9

SERVICE AND SUPPORT

Cisco Systems® offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you to protect your network investment, optimize network operations, and prepare the network for new applications to extend network intelligence and the power of your business. For more information about Cisco Services, see [Cisco Technical Support Services](#) or [Cisco Advanced Services](#).

FOR MORE INFORMATION

For more information about Cisco VFrame Server Fabric Virtualization Software 3.1, visit <http://www.cisco.com/en/US/products/ps6429/index.html> or contact your local account representative or ask-svbu-pm@cisco.com.



Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters
Cisco Systems, Inc.
168 Robinson Road
#28-01 Capital Tower
Singapore 068912
www.cisco.com
Tel: +65 6317 7777
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the **Cisco.com Website at www.cisco.com/go/offices.**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Cyprus • Czech Republic
Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy
Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal
Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden
Switzerland • Taiwan • Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2006 Cisco Systems, Inc. All rights reserved. CCSP, CCVP, the Cisco Square Bridge logo, Follow Me Browsing, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Access Registrar, Aironet, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, FormShare, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MeetingPlace, MGX, the Networkers logo, Networking Academy, Network Registrar, Packet, PIX, Post-Routing, Pre-Routing, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0601R)