Q&A

Cisco VFrame—Frequently Asked Questions

PRODUCT OVERVIEW

Q. What is Cisco® VFrame Server Virtualization Software?

A. Cisco VFrame Server Virtualization Software is a datacenter provisioning and orchestration product from Cisco Systems®. Cisco VFrame Software enables the delivery of utility computing in the datacenter, or the ability to rapidly commission and decommission a shared pool of server and I/O resources on demand. VFrame Software takes a fresh networking approach to provisioning datacenter resources by integrating orchestration and control intelligence into the infrastructure that interconnects resources together.

Cisco VFrame Software is a systems management software product that creates virtual “compute services” by programming and coordinating a fabric of server switches. A server switch is a new class of data center infrastructure that provides a platform to interconnect discreet server resources together into a high performance fabric, to connect that server fabric with shared pools of I/O and storage resources. When those resources are mapped together, it creates a virtual “compute service”. Similar to how a VLAN operates in the Ethernet world today, a compute service groups physical servers, storage resources, and IP resources into resource pools. VFrame provisions these compute services based on any number of criteria, including business application, time-of-day, required compute power, or standby servers for higher availability.

Q. What does Cisco VFrame Software manage?

A. VFrame manages servers, server I/O, and server fabric switches that provide connectivity to the server and gateways that provide connectivity between the server fabric and the rest of the datacenter network. VFrame creates virtual servers that provide the properties of a server without being physically attached to any particular physical server.

Q. What business benefits does Cisco VFrame provide?

A. The server virtualization provided by Cisco VFrame allows customers to:

- Shorten time-to-market for applications by rapid provisioning of servers in seconds
- Provide Priority1 level high availability with industry standard servers through automated failover capabilities
- Increase business agility by application demand based on addition and removal of server resources
- Simplify I/O to servers by reducing the number of interfaces and cabling by using unified fabric support
- Adapt to changing I/O demands on the server without going through physical interface changes on the server
- Retain flexibility to choose servers and storage from your preferred storage vendor.

Q. What type of datacenter environment is Cisco VFrame suited for?

A. VFrame can provide significant TCO benefits in most enterprise datacenter environments. Specifically:

- Any scale-out environment where there is an increase of x86-based servers
- Ballooning server to sysadmin ratios requiring higher efficiency in systems management
- Highly available systems need to be created out of industry standard server components
- Servers can be wired once and be capable of being provisioned for varying application needs
- Low server utilization resulting in a large number of idle servers

Q. What hardware is required to run Cisco VFrame Software?

A. Cisco VFrame Director is a software package that can be installed on a Xeon, Nacona, or Opteron-based server with a minimum of 1GB of memory, running RHEL3 U2 (32bit) with a 10-Gbps InfiniBand HCA.

Q. What server hardware platforms does Cisco VFrame Software support?

A. VFrame currently supports major x86-based server platforms from Dell, HP, IBM, and Sun as managed nodes.

Q. What operating systems does Cisco VFrame Software support?

A. VFrame supports both Linux and Windows operating systems. Redhat Enterprise Linux 3 and 4, SuSE Linux Enterprise Server 8 and 9, and Windows 2000 and Windows 2003 server editions are among the operating systems supported.

Q. How many servers can Cisco VFrame Software manage?

A. VFrame can manage up to 128 physical servers in its current version per Director instance. This number is constantly being revised upwards.

Q. What software components is VFrame made of?

A. VFrame has five components:

i. VFrame Director

ii. Linux Host Drivers

iii. Windows Host Drivers

iv. Switch OS (TopspinOS)

v. HCA boot firmware

Q. What are the components of the Cisco VFrame infrastructure?

A. The following are the components of the VFrame infrastructure:

i. x86-based physical servers

ii. InfiniBand HCAs with boot firmware

iii. Cisco SFS Series switches

iv. Ethernet Gateways

v. Fibre Channel Gateways

vi. Cables

Q. What Cisco SFS platforms does Cisco VFrame Software support?

A. Cisco VFrame supports the following Cisco Server Fabric Switch platforms:

- Cisco SFS 3000 Multifabric Server Switch Series
- Cisco SFS 3000 Series InfiniBand to Ethernet Gateway Module
- Cisco SFS 3000 Series InfiniBand to Fibre Channel Gateway Module
- Cisco SFS 7000 InfiniBand Server Switch Series

Q. What is the typical Cisco VFrame Software configuration on the Cisco SFS 3001 Switch platform?

A. The SFS 3001 switch platform can be used as the unified fabric switch in installations under 24 nodes in a non-HA configuration requiring either Fiber Channel or Ethernet connectivity.

Q. How do I order Cisco VFrame Software?

A. On Cisco.com order the base VFrame SKU: SV-VF30-BASE+5K9.

The following options are available for VFrame:

High Availability (redundant VFrame Director): SV-VF30-HAK9

Additional Licenses:

- 10 node license: LIC-SV-VF30+10K9
- 25 node license: LIC-SV-VF30+25K9
- 50 node license: LIC-SV-VF30+50K9
- 100 node license: LIC-SV-VF30+100K9

Based on the total number of nodes managed by VFrame, the licenses can be ordered in any combination.

Q. What do I get when I order Cisco VFrame?

A. The base SKU contains the Software CD. The option SKUs each contain a Right-to-Use document that provides the user the license to use that option.

Q. Does VFrame manage non-InfiniBand connected servers?

A. At this current time, Cisco VFrame Software manages servers that are connected to InfiniBand. The value propositions that VFrame provides is not limited to any one particular type of server connectivity.

TECHNOLOGY

Q. What is a virtual server?

A. A virtual server is everything that makes up a server except the physical server itself. The definition of the CPU, memory, storage/boot LUN, storage/data LUN, Fibre Channel WWNN, IP addresses, and customization metadata constitute the virtual server.

Q. What is a virtual server group?

A. A virtual server group is a logical grouping of virtual servers based on a user-defined set of characteristics. Virtual server groups usually contain virtual servers that share common properties such as an operating system, application type or tier / organizational affiliation.

Q. What is a policy and how can it be used?

A. A policy is a collection of triggers and actions. Triggers can be based on time, load, or a user-settable SNMP variable on the server. An action gets executed when a trigger is detected. An action can be the sending of a message, failover of a server, addition of a server, or deletion of a server. Policies can be used to manage failover, add or remove servers based on application load, or to generate messages based on certain system events.

Q. How does remote boot work?

A. Each server connects to the unified fabric using a 10-Gbps InfiniBand PCI-X or PCI-Express adapter, called a host channel adapter (HCA). When the server boots up, a boot PROM on this HCA communicates with the server switch, inquiring about the server identity. The server switch communicates with the physical server and maps it to the appropriate boot device, virtual I/O subsystem (including unique WWNNs), and other settings stored in the fabric. When the administrator wants to change this, Cisco VFrame Software changes this mapping in the server switch as opposed to each individual device.

Q. How fast is VFrame's failover?

A. Cisco VFrame Software failover is approximately equal to the time it takes for a server to reboot—which is usually 2-3 minutes.

Q. Is VFrame available for High Availability environments?

A. Yes. Cisco VFrame Director provides high availability by its ability to be deployed in a redundant high-availability pair, presenting a single IP interface to the administrator. The VFrame Director database is stored locally in a single instance, and stored on the SAN in high-availability mode. The image database can be stored on local storage or in the SAN as well. VFrame Director does not reside in the active data path, so it can fail without affecting server traffic, although it does provide active monitoring, failover, and policy enforcement services.

Q. What is virtual I/O?

A. Each server connects to the unified fabric using a 10-Gbps InfiniBand PCI-X or PCI-Express adapter, called a host channel adapter (HCA). When the server boots up, a boot PROM on this HCA communicates with the server switch, inquiring about the server identity. The server switch communicates with the physical server and maps it to the appropriate boot device, virtual I/O subsystem (including unique WWNNs), and other settings stored in the fabric. When the administrator wants to change this, Cisco VFrame Software changes this mapping in the server switch as opposed to each individual device.

Q. What is a golden image?

A. A golden image is a master image that is created from a server and used as the template from which virtual server images are created. These generic images can be created from scratch, or by taking a snapshot of an existing server image or virtual server. For initial creation, administrators can install an operating system to a server with local storage using standard media, and then transfer that image to the SAN LUN, or they can install it directly over the network.

Q. Can virtual servers created from the same golden image be customized?

A. Yes. Cisco VFrame Software provides the facility to customize each virtual server even if they are all created from the same golden image. Customizations can be specified at the virtual server group level or on a per-virtual server basis.

Q. What is a "Minimum Equipment List"?

A. Virtual servers also specify the minimum physical equipment allowed to be assigned to the virtual server. Administrators create a "minimum equipment list," and Cisco VFrame uses it to choose which available physical equipment to use when bringing a server online, whether manually or automatically, using predefined policies. This list can match against type of CPU, number of CPUs, amount of memory, and chipset. These fields are text based, and are matched against data set by users when configuring physical servers.

OPERATIONS

Q. How do I add a new server that needs to be managed by VFrame?

A. VFrame can automatically detect servers that are plugged into the unified server fabric. Once the system globally unique identifier (InfiniBand GUID) has been identified within the VFrame system, the administrator can input server capabilities for the server.

Q. Is there a limit on the number of images that can be stored for the virtual servers?

A. No there is no preset limit on the number of images. You can store as many images as the size of the image storage partition allows. As a rule of thumb, a standard Windows or Linux image will use up to 2-GB of storage on the disk.

Q. Is there an agent that is running on the host that is communicating with the Cisco VFrame Director?

A. In its current version, VFrame does not use any custom host-based agents. It uses standard SNMP-based system MIBs to manage policy actions.

Q. How can I monitor servers managed by Cisco VFrame?

A. The VFrame interface provides health information on the state of the physical servers that are managed by VFrame. Additionally, administrators can also integrate with existing monitoring technologies. Because TCP/IP runs standard over the InfiniBand fabric, any IP-based

monitoring agent can run on the host. VFrame provides a level of SNMP- and ping-based monitoring, and alternatively, administrators can use the SOAP/XML-based API to trigger actions on VFrame Director. It also issues e-mail notifications to a user-definable SMTP server. For network management, server switches are fully SNMP-enabled and can issue configurable SNMP traps for a wide variety of service-affecting events, including power cycling, port up/down, and multicast group changes.

Q. What SNMP versions does Cisco VFrame Software support?

A. VFrame supports SNMP v1 and v2 currently.

Q. How does VFrame work with OS/App provisioning solutions such as Altiris, OpForce or Opsware?

A. VFrame provides the bare metal OS provisioning and network orchestration, while Altiris, OpForce, or Opsware and similar solutions can complement and provide OS/Application update and patch management services. The agents that are required for these applications can be built into the virtual server image. Since most agents use TCP/IP for communications, they should work out-of-the-box with VFrame. The primary operational change is that some servers are offline when they are not being used.

Q. What kind of third-party management integration does VFrame provide?

A. To allow third-party orchestration tools to create and trigger VFrame policies, VFrame includes a SOAP 1.1/XML-based bidirectional API. VFrame Director runs an active SOAP server listening for triggers. SOAP is an XML-based communications protocol for cross-platform application integration. Triggers can reference the virtual group, the action, and optionally the physical and virtual server involved. Policies can be defined on individual servers or at the group level. Error codes are returned, and notifications can be sent to other applications when a server has been added or removed.

Q. What happens to my virtual servers if I take down the Director for maintenance?

A. The virtual servers will continue to run even if the Director becomes unavailable. The only operations affected will be any policy-based actions or image creation jobs that were scheduled to happen during the outage.

Q. What do I do if I need to change the server that the VFrame Director is running on?

A. Backup and restore utilities are built into VFrame. In the event you need to change the Director hardware you can backup the current Director configuration, reinstall VFrame Director on a different server, and restore the configuration. Please refer to the user guide for step-by-step procedures.

SECURITY

Q. How does VFrame provide security in the server environment?

A. VFrame enables multiple customers to securely share one fabric. VFrame can partition the fabric by mapping InfiniBand partitions to virtual server groups, Fibre Channel access controls, and Ethernet VLANs. One unique attribute of InfiniBand is that it is connection-oriented, and every connection is controlled by a centralized entity called a subnet manager. These InfiniBand partitions are similar to VLANs, but they also have hardware-enforced keys, which each participating member (including hosts and switches) needs to have access to. Without access to this key (PKey), neighbors cannot see other nodes outside their partitions because packets are dropped at the hardware level. InfiniBand partitions are available in limited or full memberships. Limited members can only communicate with full members and cannot see other limited members. Full members have full rights. VFrame Director creates a management partition to securely manage all the virtual servers in its domain, where Director is a full member, and managed nodes are limited members.

Q. How secure is the Cisco VFrame solution itself?

A. On the Server Fabric switches there is an extensive Role-Based Access Control (RBAC) mechanism that provides independent read-only and read-write privileges to each technology type—Ethernet, Fibre Channel, and InfiniBand, for each interface type—CLI, GUI, and SNMP. As an example a user using the GUI for Fibre Channel can be distinguished from a user using the CLI for Ethernet and can be given specific access and

control rights. Each of the management interfaces on both the switch and the VFrame Director offer secure options for connectivity such as HTTPS, SCP, SNMPv3, and SSH.

SUPPORT

Q. What types of service and support are available for the Cisco VFrame?

A. In addition to World Wide 24/7 TAC support, a full complement of implementation-based services are available at this time for the Cisco VFrame solution. This includes software and hardware support for all of the components of the solution.

Technical Support Service

Technical Support Service is available through Cisco SMARTnet® and Cisco SMARTnet Onsite. Cisco SMARTnet augments the resources of the operations staff by providing them with access to expertise, both online and on the telephone, and a range of hardware Advance Replacement options. SMARTnet Onsite complements the hardware Advance Replacement feature by adding the services of a field engineer, services that can be critical for those locations where staffing is insufficient or unavailable to perform parts replacement activities. For more information about Cisco SMARTnet, visit http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/ps2978/serv_group_home.html.

Advanced Services

Total Implementation Solutions (TIS) offers a full range of implementation solutions including project management; project engineering, configuration, staging, and rollout coordination, and ensuring correct installation and deployment. Configuration services now include development and verification of configuration for intelligent services such as Cisco VFrame Server Virtualization Software. For more information about Advanced Services, http://www.cisco.com/go/services.

PRODUCT AND CONTACT INFORMATION

Q. Where can I find technical and product specifications and other additional information about the Cisco VFrame solution?

A. For product literature including data sheets and product specifications, see the Server Networking and Virtualization Website at http://www.cisco.com/en/US/products/ps6418/index.html.

Q. What are the part numbers for the Cisco VFrame and the SFS family of products?

A. The part numbers and orderability information for the new Cisco SFS switches and SFS family of products is available at http://www.cisco.com/en/US/products/ps6418/index.html#products.

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