Application Provisioning and the Data Center Infrastructure

Cisco VFrame Data Center for Virtual and Automated Provisioning
Trends in the Data Center Evolution

**Multilayer Network Consolidation**

An architecture for scalable cost-effective growth and rich service integration

**Modular and Virtualized**

A framework for segmentation and end-to-end virtualization of resources

**Service-Oriented Automation**

A forward-looking approach where resources are consolidated on common fabrics and securely accessible on-demand
## Challenges in the Data Center Today

| CTO/CIO | “How can I add make IT services more flexible and provide a competitive advantage?” |
| Apps | “I need to get new applications deployed quickly and cost-effectively.” |
| Server | “Server sprawl is draining my resources and increasing my cost for facilities and management.” |
| Sec Ops | “How do I manage and set up multiple security policies for different applications over a common backbone?” |
| Storage | “I need to map my virtualized storage resources faster.” |
| Network | “The network is ubiquitous – therefore it has to be flexible to anything thrown at it.” |
Assume you just want to add one server to a web-farm…

The challenge is one of ‘coordination delays’. This type of simple scale-out of an existing server often takes enterprises 90+ days.

New service turn-ups, after the application has been developed, often take 180+ days.

VFrame is designed to eliminate these delays and automate the provisioning of services.
Data Center and Network Evolution

Data Center 1.0
Mainframe
CENTRALIZED

Data Center 2.0
Client-Server and Distributed Computing
DECENTRALIZED

Data Center 3.0
Service Oriented and Web 2.0 Based
VIRTUALIZED

Consolidate
Virtualize
Automate
Understanding Virtualization
Simplicity and Agility in Managing Resources

Logical

Many : 1
1 : Many

Physical

Benefit:
Flexible configuration and management of all infrastructure resources to reduce costs and increase agility

One resource → many for increased flexibility
One resource → one to simplify
Data Center Virtualization via the Network

Service Orchestration

End-to-End Service Provisioning

Client  Security  Appl’n Delivery  LAN  Servers  SAN  Storage

Web, Apps

Blades

Disk and Tape

NAS File
Infrastructure Standardization and Consolidation
Server-Centric to Service-Centric

Service-Centric Model
“Pools” of Standardized Resources
Assembled On-demand to Create “Virtual Infrastructure”
Creating Virtual Compute Resources

- Massive proliferation of server resources
- Server manager configures pools of compute, storage and I/O
- Based on application, process, or business objectives
Virtualized Server Models

One Server to Many Virtualized Services

- Dynamic Provisioning
- X86 Server
- Hypervisor
- Soft Switch
- VM 1
- VM 2
- VM 3
- VM 4
- VM 5
- Storage Network
- Communications Network

Many Servers to one Virtualized Service

- Dynamic Provisioning
- Server Pool
- NAS
- Storage Network
- Communications Network

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Introducing the VFrame Data Center Solution

- VFrame is a framework service virtualization and provisioning in the data center
- Abstracts the physical topology from the policy-based "logical one"
- VFrame Components
  - VFrame Director – dedicated server which stores policies, logical topology and device information
  - VFrame agent – resides on server to feed back information to VFrame director (Windows or Linux support)
- Configurable Devices
  - Catalyst 6500
  - MDS 9500
  - Content Service Module
  - Firewall Service Module
VFrame Operation

1. Discovery of physical infrastructure and topology
2. Creation of application service template – a virtual "template" per application or policy
3. Mapping of the logical topology over the physical
4. Provisioning of physical resource when application service is ‘started’
5. Start application service based on best available physical resource or path
6. Ongoing monitoring allows reconfiguration/redeployment of servers on the fly
VFrame Key Benefits
Providing Customer Benefits and Differentiation

End to End Service Orientation

Data Center Virtualization

Vertical Provisioning
Service Orientation and Virtualization

Service Template

- Load balancing configured as needed per application
- Virtualized resources and instances
- LAN, WAN, Internet Access
- Networked application services
- Integrated security
- Security policies per application class
- Virtual Firewalling
- Storage Virtualization
- Fabric-assisted Applications
- Data Replication Services
- Compute power via “utility computing”
- Golden Image and Boot OS

Physical devices abstracted in the data center – pooled per defined service
Result: An Application-Centric, Service Oriented Data Center
Result: Application-based Services

- 60+% Server Utilization
- ~30% Server Reduction

The Virtualized Data Center Network

- VFrame Provisioning

- Oracle
- SAP
- Siebel
- Microsoft

60+% Server Utilization
~30% Server Reduction
VFrame Interaction with Data Center Management Applications

Cisco VFrame
Automated Business Service Infrastructure Provisioning

Application Service Management
IBM ThinkDynamics, Veritas i3, Mercury

Monitoring
IBM Tivoli, HP Openview, BMC Patrol, CA Unicenter

WebServices

WebServices/CIM/PI

Prop. XML
CLI
SNMP
CIM
PXE

SNMP

SNMP

IPMI
SMI-S
XML/CLI

Proprietary

Cisco Element/Network Managers
Fabric Manager, VMS, CiscoView, IME

Non Cisco Element Managers/Virtualizers
iLO, VMWare, EMC ECC, EMC VL, Invista

Cisco Data Center Elements
Storage, Ethernet, InfiniBand Switches
FW, SSL, CSM, IDS service modules

Non Cisco Data Center Elements
Servers, Storage Arrays

Physical Data Center Infrastructure
Virtualizing the Data Center Infrastructure

INTELLIGENT ETHERNET SWITCHING
- Intelligent Switching Svs
- SSL
- Firewall
- Intrusion Prevention
- Server Load Balancing

Virtual “Backplane” Between All Resources
- Networking Pool
- Utility Network
- Processor Pool
- Storage Pool

INTELLIGENT SAN SWITCHING
- Volume Mgmt.
- Backup Assist
- Replication
- NAS

Virtualization
Business Benefits of VFrame

- Dramatically reduce time to provision application infrastructure
  Coordinated provisioning of servers, storage, network and network services in minutes rather than days, weeks or even months

- Change infrastructure based on policies in response to application needs
  Add, delete and change servers on demand

- Eliminate peak load provisioning for better capacity utilization
  Just in time provisioning allows resources to come online only when needed
  Reduce TCO by 50%

- Service level diagnostics enable quicker troubleshoot and fix
  Single pane visibility into health of servers, storage, network and network services enhances troubleshooting capabilities

- Increased Reliability, Availability, Serviceability
  Eliminate local disk in servers, primary cause of server failure

- Increased Agility to IT
  Flexibility to bring-up services quickly and not be tied to the physical infrastructure
  IT able to do more with fixed budget; Provide competitive advantage to business, not just table stakes work