



VFrame Data Center

Data Center

Virtualization Orchestration



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Virtualization Life Cycle Management

Consolidation

- *Reduce data center facility strains*
- *Server and storage lead*
- *Links into green strategies*

Virtualization

- *Better Utilization on existing chassis*
- *Virtualization enhances consolidation*
- *But, complexity is added...*

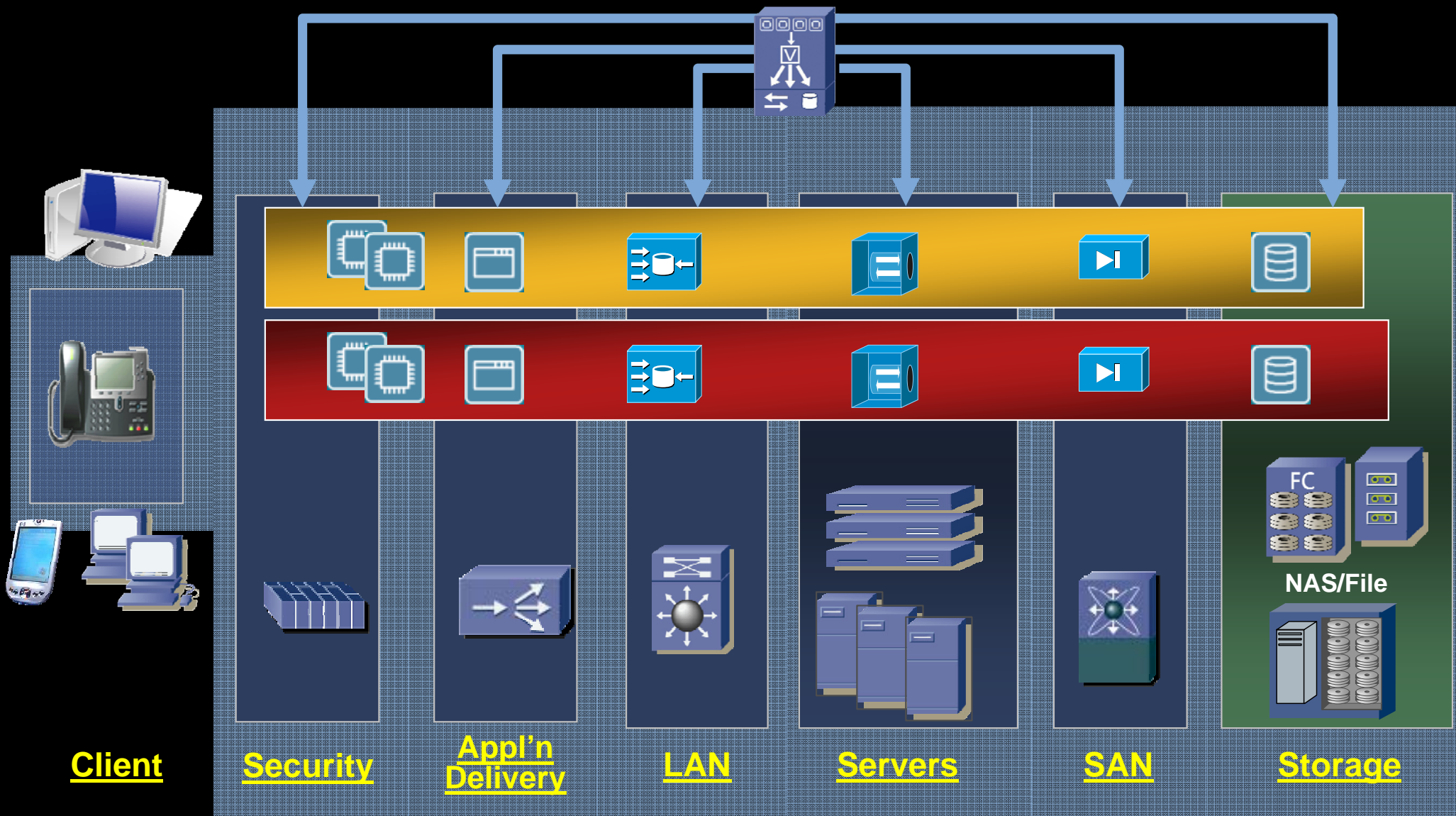
Automation

- *Simplify Virtualized Environments*
- *Enabler of 'Service Velocity'*
- *Reduces Risk of Operator Error*
- *Results - Consistent, Repeatable*



Data Center Transformation: From Silos to Services via the Network

Service Orchestration



Data Center Virtualization

Orchestration

Network Virtualization

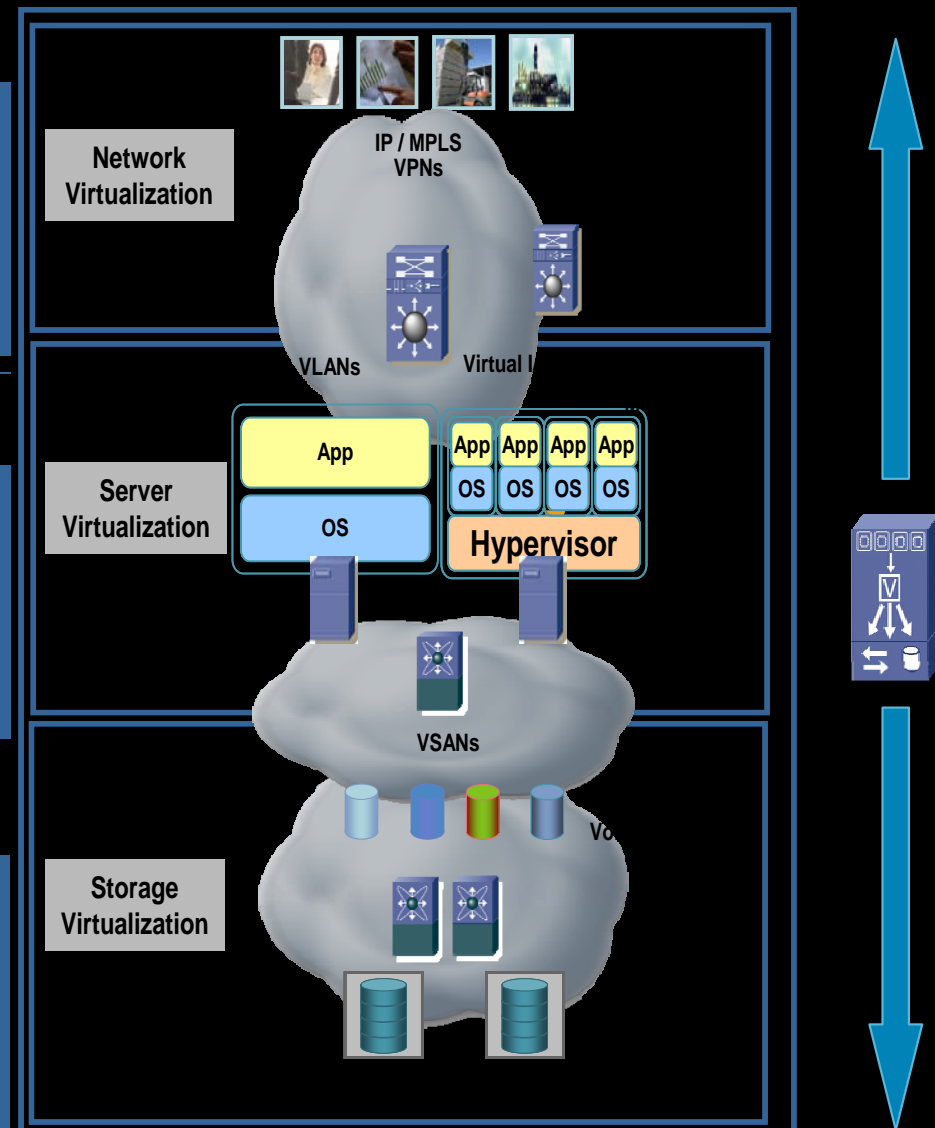
- Segmentation and security
- Higher resource flexibility
- Improved capacity utilization

Server Virtualization

- Consolidation of physical servers
- Virtual Machine mobility
- Rapid application deployment with VMs

Storage Virtualization

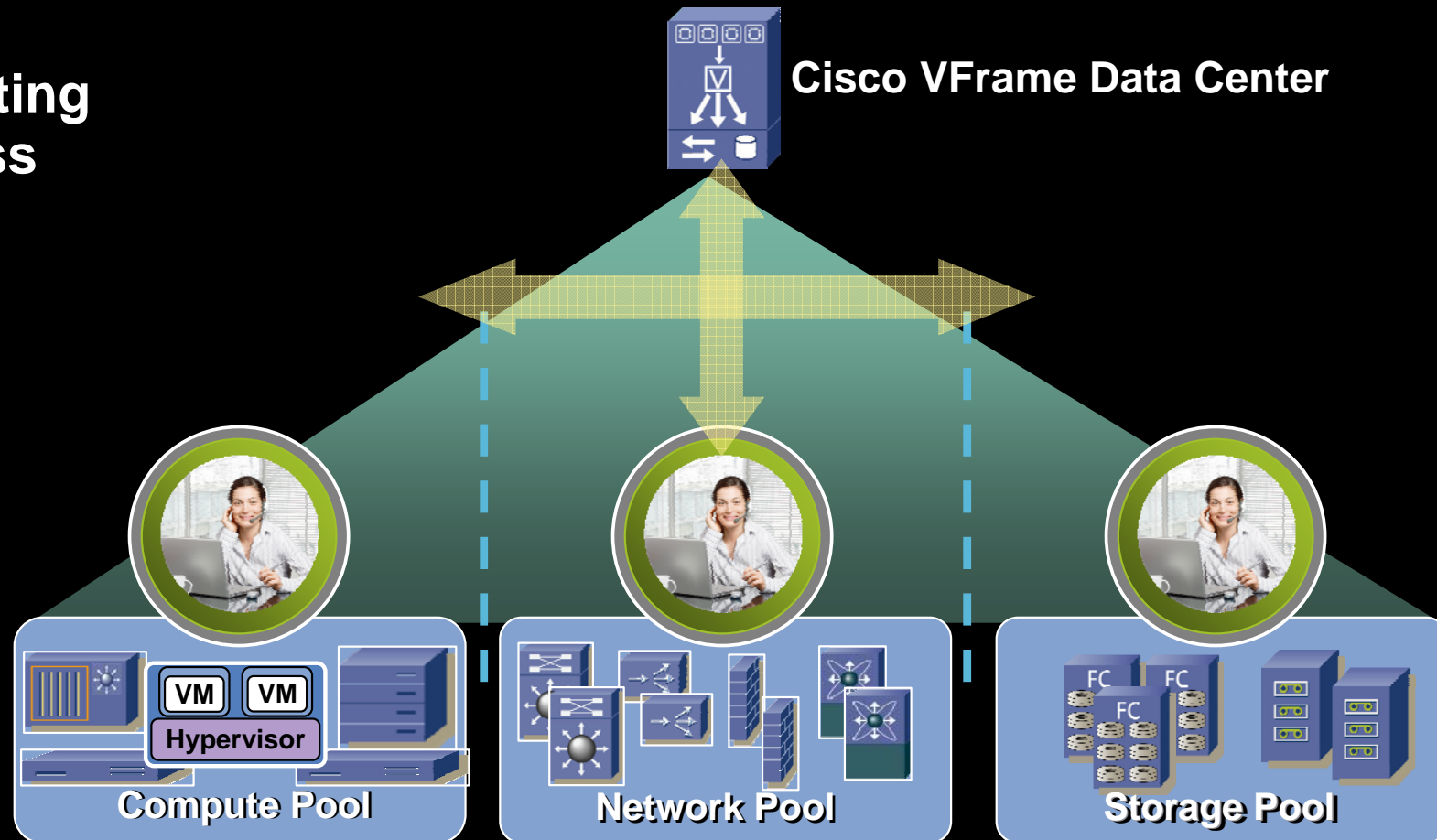
- Segmentation and security
- Improved data mgmt. & compliance
- Non-disruptive provisioning & migration



Cisco VFrame Data Center: Network-Driven Service Orchestration

Coordinated provisioning and reuse of
physical and virtualized
compute, storage, and network resources

- Increased hosting responsiveness
- Operational collaboration
- Robust server virtualization integration



Event Driven with Pre Defined Workflows

Current Provisioning Approach

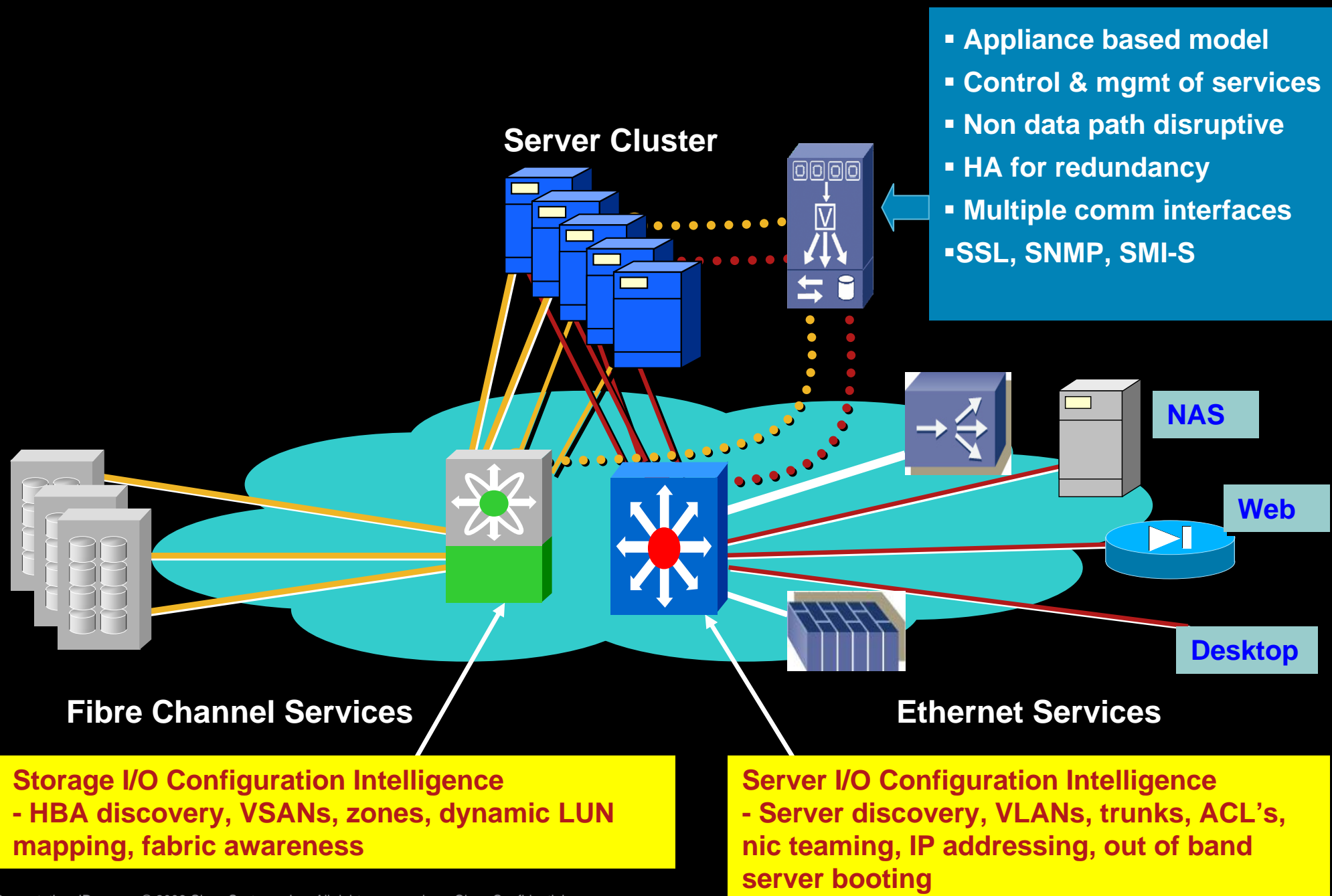
- End to end provisioning typically has many steps
- In silo's these are not well organized
- Troubleshooting configurations take hours and as a result no one likes changes
- This approach handcuffs a services approach

VFrame Data Center-A New Approach

- When all configurations are under one umbrella there is better agility and troubleshooting
- Adding workflow logic drives automation
- Insuring changes take effect and are recorded offers change mgmt control
- The way of the future

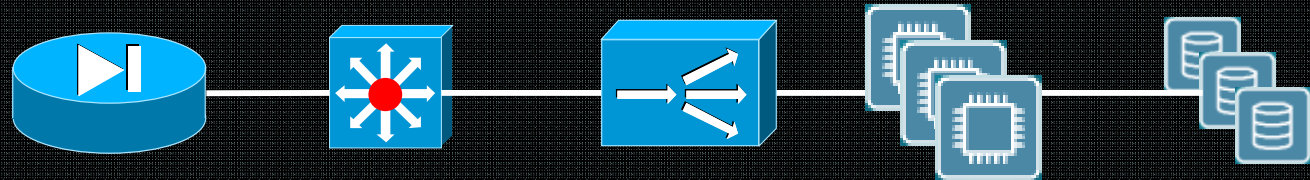


Multi-Fabric Service Orchestration

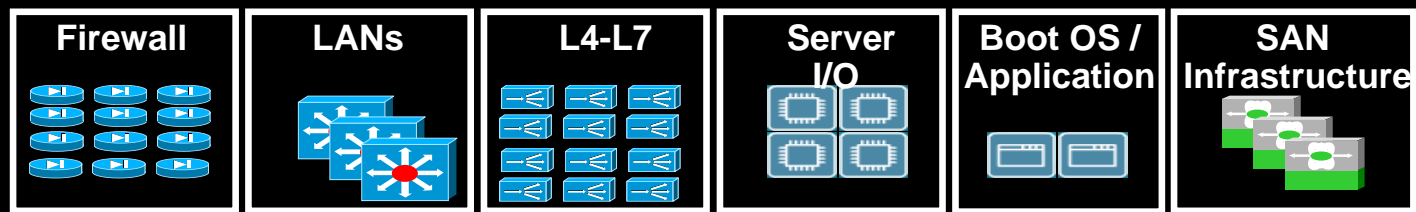


An Infrastructure Orchestration Model

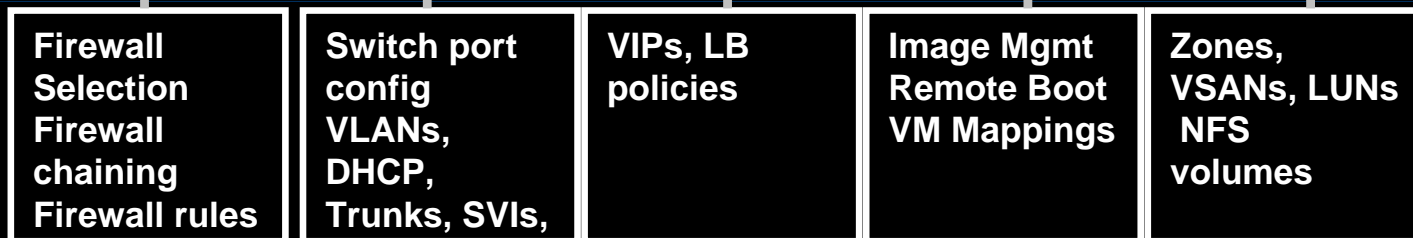
Design
Abstraction



Discovery
Services



Deploy
Virtual
Services



Automate



Automated Failover



Policy based resource optimization



Management Integration thru API



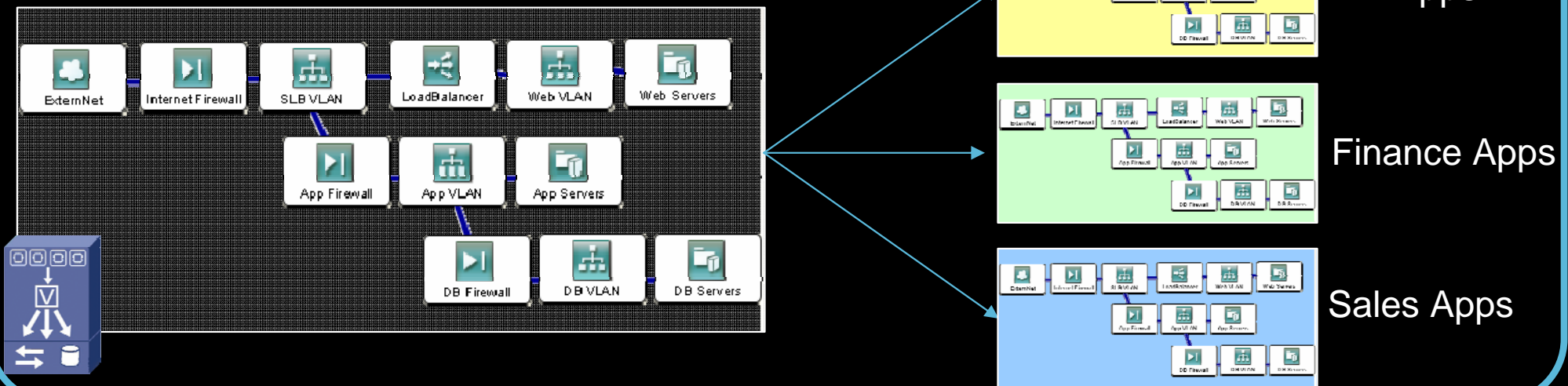
Service Maintenance

Customer Use Case

Rapid, Repeatable Service Deployment

- Applicable when upgrading or rolling out new servers, apps
- Design everything up front on first model server
- Repeat “N” times with servers up and running in 5 minutes
- Capacity on demand with shared utility pool

3 Tier Service Template



Server Virtualization I/O Requirements

Challenge

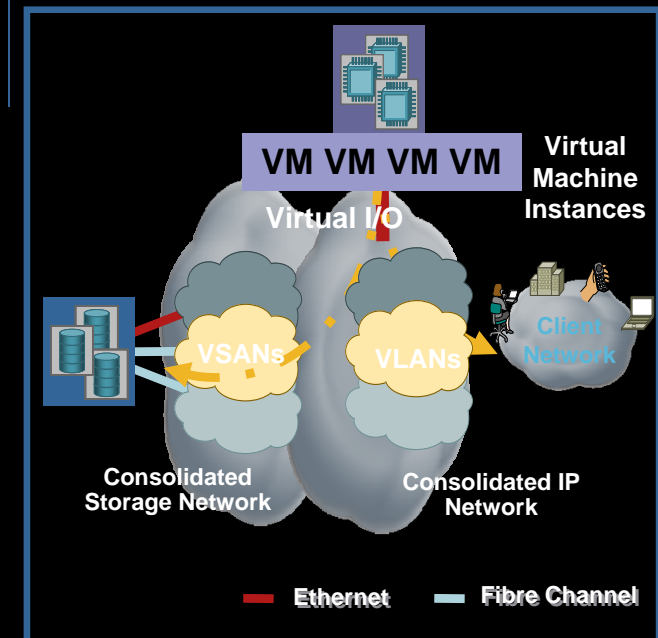
- Ensure that virtual machines receive the same network services as physical servers for optimal performance, availability, security and troubleshooting

Solutions

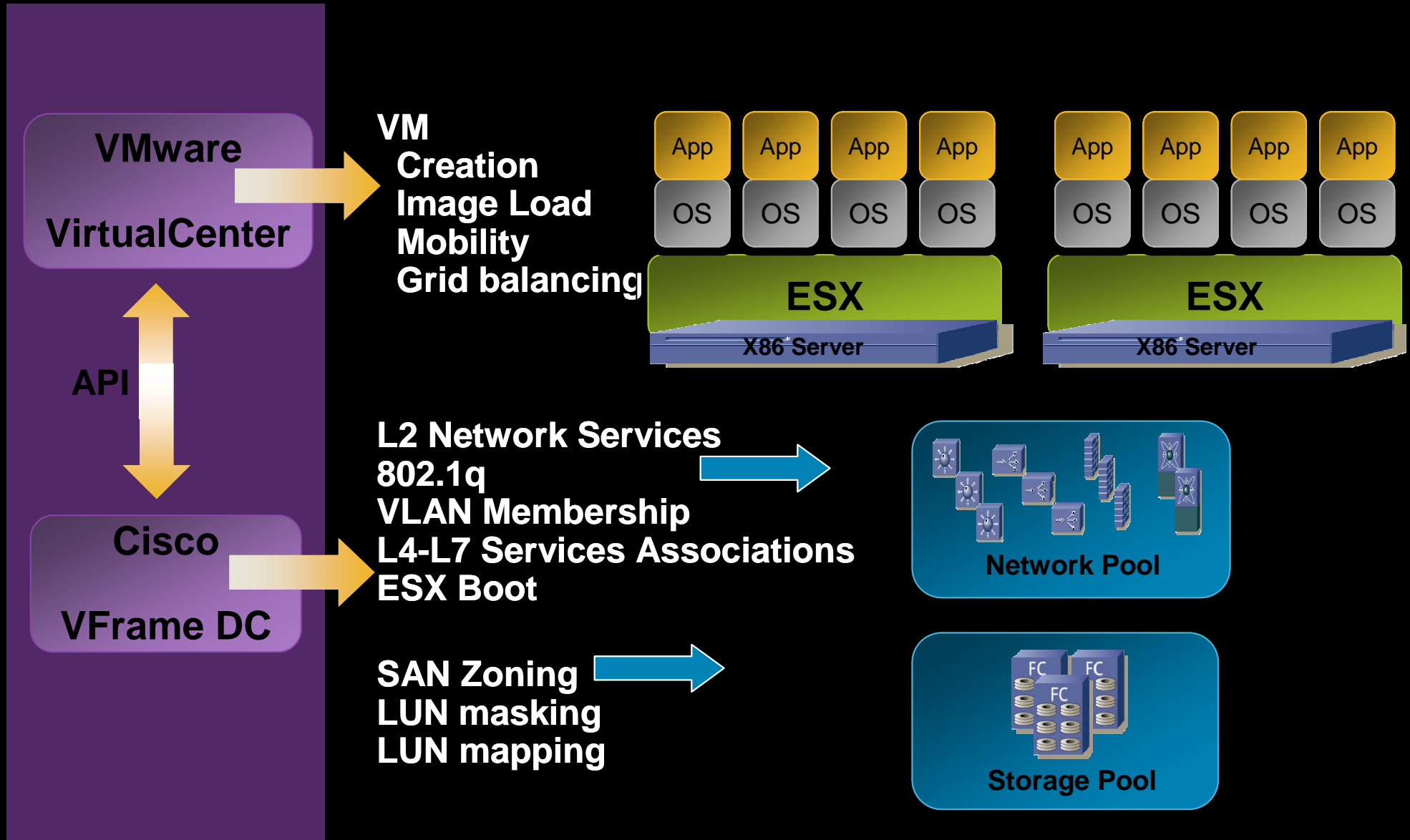
- Provide per VM segmentation on SAN and LAN
- Provision security and application optimization services to each VM
- Align services to mobile VMs

Technologies

- Cisco: MDS VSANs and NPIV, Catalyst IP Switching (VLANs and PVLANS, 802.3ad, QoS, virtual firewalls, ACE modules)
- Provisioning orchestration within VFrame DC, CY08

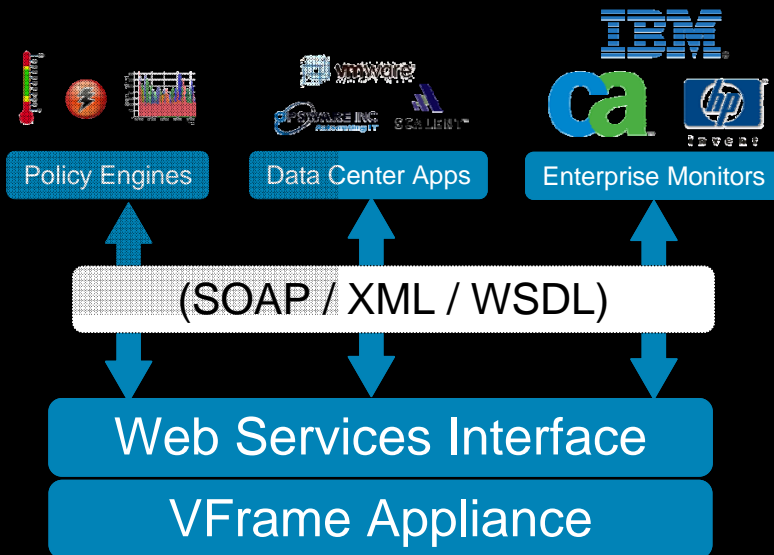


Integration with Hypervisors



Middleware API's

- **3rd Party Device API**
- **Event Monitoring**
 - Coordinated failure and boot events
- **Server Image Management**
 - Image creation with package aware mechanisms
 - Replication control with storage subsystem
- **Server Identity Remapping**
 - Fabric identity programming within the server
- **Virtual Machine Management**
 - Messaging to VM controller for VM actions



VFrame Data Center Roadmap

Q4, CY07

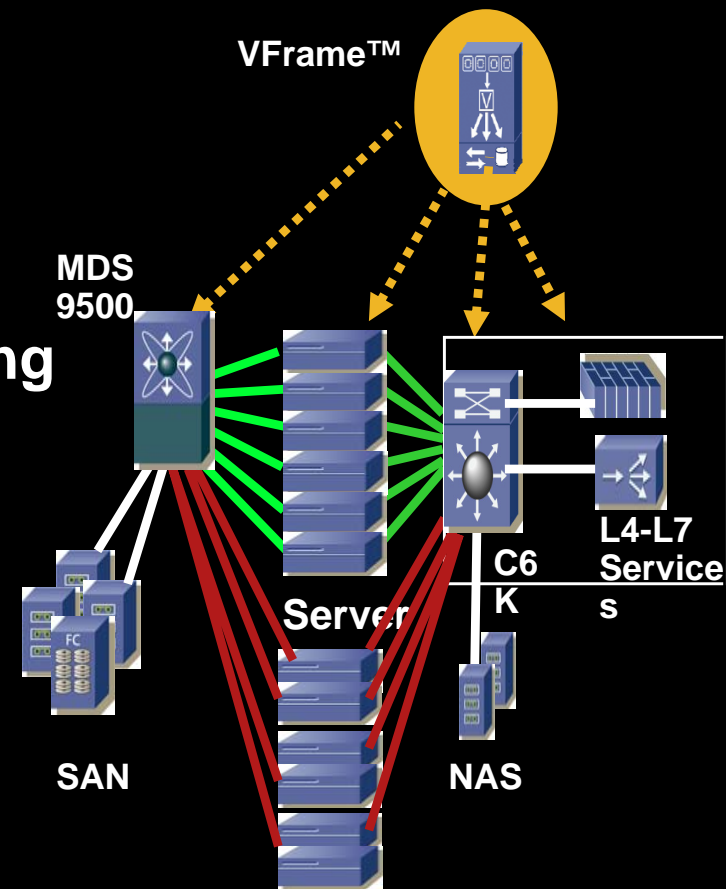
- Blade switch integration
- Catalyst 4K integration
- API's with data center ops tools
- Experimental release of ESX boot integration

CY08

- FCS of ESX boot code
 - Resource filtering of VLANs, array ports etc
- Worldwide name and mac address spoofing
- Element mgmt integration of ANM with ACE
- Additional Cisco platforms
- 3rd party device API's

VFrame Data Center: Features

- Multi-fabric discovery and provisioning
- Fully stressed tested with 500 servers
- SAN and NAS server boot automation
- Creation and removal of service templates
- Virtualized services views for troubleshooting
- Configuration of L4-L7 services
- Appliance based w/secondary as back-up
- Full RBAC for multi-department sharing
- Storage templates for configuring LUNs
- Syslog reporting of configuration operations
- Rich inventory of servers with 3rd party policy API's



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