VMware
vCloud Automation Center 6.0

Reference Architecture

TECHNICAL WHITE PAPER

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Overview

This document provides recommendations about deployment topology, hardware specifications, interoperability, and scalability for the following VMware components.

- VMware vCloud® Automation Center™ 6.0
- VMware vCloud® Application Director™ 6.0
- VMware® IT Business Management Suite™ Standard Edition 1.0

For software requirements, software installations, and supported platforms, see the Documentation Centers for these products.

Initial Deployment Recommendations

This section describes the general deployment configuration for vCloud Automation Center, vCloud Application Director, and IT Business Management.

General Recommendations

Keep IT Business Management Standard Edition, vCenter Server, your VMware identity virtual appliance, and vCloud Automation Center in the same time zone and with their clocks synchronized. Otherwise, data synchronization might be delayed.

You can deploy the vCloud Automation Center DEM Worker and proxy agents over a WAN, but do not deploy other components of vCloud Automation Center, vCloud Application Director, or IT Business Management Standard Edition over a WAN as performance might be degraded.

Deploy IT Business Management Standard Edition in the same LAN where your vCenter Server is deployed.

You can use vCenter SSO 5.5.0b instead of the Identity Appliance.

vCloud Automation Center

The general deployment configuration for vCloud Automation Center should be considered as a starting point for deployment. After initial testing and deployment to production, you should continue to monitor performance and allocate additional resources if necessary, as described in Scalability Considerations.

Load Balancer Considerations

Use the Least Response Time or Round Robin method to balance traffic to the vCloud Automation Center virtual appliances and infrastructure web servers. Enable session affinity or the sticky session feature to direct subsequent requests from each unique session to the same web server in the load balancer pool.

You can use a load balancer to manage failover for the Manager Service, but do not use a load balancing algorithm because only one Manager Service is active at a time. Do not use session affinity when managing failover with a load balancer.

Use only port 443, the default HTTPS port, when load balancing the vCloud Automation Center Virtual Appliance, Infrastructure Web server, and Infrastructure Manager server together.

Database Deployment

For production deployments, you should deploy a dedicated database server to host the vPostgres and MSSQL databases.

Data Collection Configuration

The default data collection settings provide a good starting point for most implementations. After deploying to production, continue to monitor the performance of data collection to determine if you need to make any adjustments.

Proxy Agents

Agents should be deployed in the same data center as the endpoint they are associated with. Thus, it is possible for a deployment to have multiple agent servers distributed around the globe. Additional agents can be installed to increase throughput and concurrency.

For example, a user has vSphere endpoints in Palo Alto and in London. Based on the reference architecture, four agent servers should be deployed to maintain high availability, two in Palo Alto and two in London.

Distributed Execution Manager (DEM) Configuration

In general, DEMs should be located as close to the Model Manager host as possible. The DEM Orchestrator must have strong network connectivity to the Model Manager at all times. You should have two DEM Orchestrator instances (one for failover) and two DEM Worker instances in your primary data center.

If a DEM Worker instance must execute a location-specific workflow, the instance should be installed in that location.

You must assign skills to the relevant workflows and DEMs to ensure that those workflows are always executed by DEMs in the correct location. For information about assigning skills to workflows and DEMs using the vCloud Automation Center Designer console, see the vCloud Automation Center *Extensibility* documentation.

For the best performance, DEMs and agents should be installed on separate machines. For additional guidance about installing vCloud Automation Center agents, see the vCloud Automation Center *Installation and Configuration* guide.

vCenter Orchestrator

In general, an external vCenter Orchestrator system should be used for each tenant to enforce tenant isolation.

vCloud Application Director

vCloud Application Director supports a single instance setup.

To avoid security and performance problems occurring in the vCloud Application Director server, do not add unsupported services or configure the server other than what is mentioned in this document and the product documentation. See the VMware vCloud Application Director 6.0 Documentation Center.

Do not use vCloud Application Director as the content server. A separate content server or servers with appropriate bandwidth and security features are required. vCloud Application Director hosts only the predefined sample out-of-the-box (OOB) content.

The content server should be in the same network as the deployments to improve performance when a deployment requires downloading a large file from an external source. Multiple networks can share a content server if the traffic and the data transfer rate are light.

RabbitMQ and Postgres

You should keep the default configurations of RabbitMq and Postgres. If you do plan to change those

configurations, consult their documentation.

Authentication Setup

When setting up vCloud Application Director, you can use the vCloud Automation Center Single Sign-On (SSO) capability to manage users in one place.

IT Business Management

Load Balancer Considerations

For data collection connections, load balancing is not supported. For more information, see Scalability Considerations.

In the IT Business Management virtual appliance, for UI/API client connections, you can use the vCloud Automation Center load balancer.

NOTE: This has not been tested officially.

Scalability Considerations

This section describes various performance characteristics of vCloud Automation Center, vCloud Application Director, and IT Business Management. It provides recommendations for your initial deployment based on anticipated usage and guidance for tuning performance based on actual usage over time.

vCloud Automation Center

Data Collection Scalability

The time required for data collection to complete depends on several factors, including the capacity of the compute resource and the number of machines on the compute resource or endpoint, current system, and network load, among other variables. The performance scales at a different rate for different types of data collection.

Each type of data collection has a default interval that can be overridden or modified. Infrastructure administrators can manually initiate data collection for infrastructure source endpoints and fabric administrators can manually initiate data collection for compute resources. The following values are the default intervals for data collection.

DATA COLLECTION TYPE	DEFAULT INTERVAL
Inventory	Every 24 hours (daily)
State	Every 15 minutes
Performance	Every 24 hours (daily)

Performance Analysis and Tuning

As the amount of resources to be data collected increases, the time required to complete data collection may become longer than the interval between data collections, particularly for state data collection. Check the Data Collection page for a compute resource or endpoint to determine whether data collection is completing in time or is being queued. If the Last Completed field always displays “In queue” or “In progress” instead of a timestamp when data collection last completed, you may need to decrease the data collection frequency (that is, increase the interval between data collections).

Alternatively, you can increase the concurrent data collection limit per agent. By default, vCloud Automation Center limits concurrent data collection activities to two per agent and queues requests that are over this limit. This allows data collection activities to complete quickly while not affecting overall performance. It is possible to raise the limit to take advantage of concurrent data collection but this should be weighed against any degradation in overall performance.

If you do increase the configured vCloud Automation Center per-agent limit, you may want to increase one or more of these execution timeout intervals. For more information about configuring data collection concurrency and timeout intervals, see the vCloud Automation Center *System Administration* guide. Data collection is CPU-intensive for the Manager Service. Increasing the processing power of the Manager Service host can decrease the time required for data collection overall.

Data collection for Amazon EC2 in particular can be very CPU-intensive, especially when running data collection on multiple regions concurrently and when those regions have not had data collection run on them before. This can cause an overall degradation in website performance. You should decrease the frequency of Amazon inventory data collection if it is having a noticeable effect on performance.

Workflow Processing Scalability

The average workflow processing time (from when the DEM Orchestrator starts preprocessing the workflow to when the workflow finishes executing) increases with the number of concurrent workflows. Workflow volume is a function of the amount of vCloud Automation Center activity, including machine requests and some data collection activities.

Performance Analysis and Tuning

You can use the Distributed Execution Status page to view the total number of workflows that are in progress or pending at any time, and you can use the Workflow History page to determine how long it takes to execute a given workflow.

If you have a large number of pending workflows, or if workflows are taking longer to complete, you should add more DEM Worker instances to pick up the workflows. Each DEM Worker instance can process 15 concurrent workflows. Excess workflows are queued for execution.

Additionally, you can adjust workflow schedules to minimize the number of workflows scheduled to be kicked off at the same time. For example, rather than scheduling all hourly workflows to execute at the top of the hour, you can stagger their execution so they do not compete for DEM resources at the same time. For more information on workflows, see the vCloud Automation Center *Extensibility* documentation.

Some workflows, particularly certain custom workflows, can be very CPU-intensive. If the CPU load on the DEM Worker machines is high, consider increasing the processing power of the DEM machine or adding more DEM machines to your environment.

vCloud Application Director

vCloud Application Director can scale to over 10,000 managed VMs and over 2,000 catalog items. You can run over 40 concurrent deployments and support over 100 concurrent users.

The performance does not take into account the cloud provider capacity or other external deployment tools vCloud Application Director depends on. An application needs a cloud provider to provision a VM and other resources. Overloading a cloud provider might not allow vCloud Application Director to meet the minimum load expectations. Refer to the product documentation for your cloud infrastructure product or external tool for information on how the system can handle a certain load.

Memory Configuration

You can adjust the available vCloud Application Director server memory by configuring the maximum heap

size.

1. Navigate to the /home/darwin/tcserver/bin/setenv.sh file.
2. Open the file and locate JVM_OPTS and change the Xmx value.

   For example, to increase the maximum heap size to 3GB, change the Xmx value to 3072m in the code.

   (Sample code) `JVM_OPTS="-Xms256m –Xmx3072m -XX:MaxPermSize=256m`
3. Restart the vCloud Application Director server.

   ```
   vmware-darwin-tcserver restart
   ```

You can also specify a larger initial heap size by changing the -Xms value to reserve larger memory. If the load is uncertain, you can reserve a smaller initial memory footprint to conserve the memory for other processes running on the server. If the load is consistent, then you can have an initial large reserve for efficiency.

You can configure different heap size values to find the best one for your load. The maximum heap size of an application server should be at least half of the total memory. The rest of the memory should be left for the Postgres, RabbitMq, and other system processes.

There is no need to change the -XX:MaxPermSize value unless you are trying to troubleshoot a permgen error.

IT Business Management

IT Business Management Standard Edition can scale up to 20,000 virtual machines across four vCenter Server instances. The first synchronization of the inventory data collection takes around three hours to synchronize 20,000 virtual machines across three vCenter Server instances. Synchronization of statistics from vCenter Server takes around one hour for 20,000 virtual machines. By default, the cost calculation job runs every day and takes around two hours for each run for 20,000 virtual machines.

NOTE: In version 1.0, the default configuration of the IT Business Management virtual appliance can support up to 20,000 VMs. Increasing the limits of the virtual appliance beyond its default configuration does not increase the number of VMs it can support.

High Availability Considerations

vCloud Automation Center

Identity Appliance

High availability (HA) and failover protection for the Identity appliance are handled outside of vCloud Automation Center. Use a vSphere HA-enabled cluster to protect the virtual appliance.

vCloud Automation Center Appliance

vCloud Automation Center appliances support active-active high availability. To enable high availability for these virtual appliances, place them under a load balancer and use an external vPostgres appliance. See the vCloud Automation Center *Installation and Configuration* guide for more information.

Infrastructure Web Server

The Infrastructure Web Server components all support active-active high availability. To enable high availability for these components, place them under a load balancer.

Infrastructure Manager Service

The Manager Service component supports active-passive high availability. To enable high availability for this component, place two Manager Services under a load balancer. As two Manager Services cannot be active at the same time, disable the passive Manager Service in the cluster and stop the Windows service.

If the active Manager Service fails, stop the Windows service (if not already stopped) under the load balancer. Enable the passive Manager Service and restart the Windows service under the load balancer. See the vCloud Automation Center *Installation and Configuration* documentation for more information.

Agents

Agents support active-active high availability. See the vCloud Automation Center *System Administration* documentation for information on configuring agents for high availability. You should also check the target service for high availability.

Distributed Execution Manager (DEM) Worker

DEMs running under the Worker role support active-active high availability. If a DEM Worker instance fails, the DEM Orchestrator detects the failure and cancels any workflows being executed by the DEM Worker instance. When the DEM Worker instance comes back online, it detects that the DEM Orchestrator has canceled the workflows of the instance and stops executing them. To prevent workflows from being canceled prematurely, a DEM Worker instance must be offline for several minutes before its workflows can be cancelled.

Distributed Execution Manager (DEM) Orchestrator

DEMs running under the Orchestrator role support active-active high availability. When a DEM Orchestrator starts, it searches for another running DEM Orchestrator. If none is found, it starts executing as the primary DEM Orchestrator. If it does find another running DEM Orchestrator, it goes into a passive mode and monitors the other primary DEM Orchestrator to detect an outage. If it detects an outage, it takes over as the primary. When the previous primary comes back online, it detects that another DEM Orchestrator has taken over its role as primary and goes into a passive state.

Microsoft SQL Server

Cluster the Microsoft SQL Server database using Windows clustering for high availability.

vCenter Orchestrator

See the vCenter Orchestrator documentation for information on high availability.

vCloud Application Director

vCloud Application Director 6.0 does not support load balancing for multiple instances.

To reduce the down time and provide quick recovery from disaster, you can implement some or all of the following strategies.

- Select appropriate resources for the vCloud Application Director load. Do not overload the system. Refer to the hardware specification section for the recommended load.
- Divide the application deployments to use multiple vCloud Application Director instances. If there are

shared applications or components, you can use the import and export feature to synchronize the data among instances.

- Take snapshots of the vCloud Application Director virtual appliance when there is a major change applied to the environment. The snapshot minimizes the downtime and you can recover data if the system fails.
- Use the vSphere High Availability feature, which restarts a failed VM. See the vSphere product documentation for instruction on how to set up the feature.

IT Business Management

Use the vSphere HA feature for the IT Business Management virtual appliance. To configure the vSphere HA feature on the ESXi host, see the VMware vCenter Server and Host Management guide.

vCloud Automation Center Machines

The following table indicates which components to install on each server profile in your deployment, along with their required and recommended hardware specifications.

SERVER ROLE	DESCRIPTION	COMPONENTS	REQUIRED HARDWARE SPECIFICATIONS	RECOMMENDED HARDWARE SPECIFICATIONS
Identity Appliance	Virtual appliance that provides Single Sign-On (SSO) capabilities for the vCloud Automation Center environment		CPU: 1 vCPU RAM: 2 GB Disk: 10GB Network: 1GB/s	Not applicable
vCloud Automation Center Appliance	Virtual appliance that deploys the vCloud Automation Center server	tcServer vPostgresSQL VMWARE SLES	CPU: 2 vCPU RAM: 8 GB Disk: 30 GB Network: 1GB/s	CPU: 4 vCPU RAM: 16 GB Disk: 30 GB Network: 1GB/s
Infrastructure Web Server		Website	CPU: 2 vCPU RAM: 2 GB Disk: 40 GB Network: 1GB/s	CPU: 2 vCPU RAM: 4 GB Disk: 40 GB Network: 1GB/s
Infrastructure Manager Server		Manager Service DEM Orchestrator	CPU: 2 vCPU RAM: 2 GB Disk: 40 GB Network: 1GB/s	CPU: 2 vCPU RAM: 4 GB Disk: 40 GB Network: 1GB/s
Infrastructure Web/Manager Server		Infrastructure Web/Manager Server	CPU: 2 vCPU RAM: 4 GB Disk: 40 GB Network: 1GB/s	CPU: 2 vCPU RAM: 8 GB Disk: 40 GB Network: 1GB/s
Infrastructure DEM Server		(one or more) DEM Workers	CPU: 2 vCPU RAM: 2 GB Disk: 40 GB Network: 1GB/s	CPU: 2 vCPU RAM: 6 GB Disk: 40 GB Network: 1GB/s

			Per DEM Worker	Per DEM Worker
Infrastructure Agent Server		(one or more) Proxy Agent	CPU: 2 vCPU RAM: 4 GB Disk: 40 GB Network: 1GB/s	CPU: 2 vCPU RAM: 4 GB Disk: 40 GB Network: 1GB/s
vPostgres Virtual Appliance			CPU: 2 vCPU RAM: 2 GB Disk: 20 GB Network: 1GB/s	CPU: 2 vCPU RAM: 4 GB Disk: 20 GB Network: 1GB/s
MSSQL Database Server		Infrastructure Database	CPU: 2 vCPU RAM: 8 GB Disk: 40 GB Network: 1GB/s	CPU: 8 vCPU RAM: 16 GB Disk: 80 GB Network: 1GB/s
vCloud Application Director	Small deployment (see Small Deployment on page 11)	tcServer PostgresSQL VMWARE SLES RabbitMQ	CPU: 2 vCPU RAM: 4GB Disk: 16GB Network: 1 GB/s	Same as required
	Medium deployment (see Medium Deployment on page 16)	tcServer PostgresSQL VMWARE SLES RabbitMQ	CPU: 4 vCPU RAM: 8GB Disk: 30GB Network: 1 GB/s	Same as required
	Large deployment (see Large Deployment on page 22)	tcServer PostgresSQL VMWARE SLES RabbitMQ	CPU: 8 vCPU RAM: 16GB Disk: 50GB Network: 1 GB/s	Same as required
IT Business Management Virtual Appliance		vPostgresSQL tcServer VMWARE SLES	CPU: 2 vCPU RAM: 4GB Disk: 50GB Network: 1 GB/s	CPU: 2 vCPU RAM: 4GB Disk: 50GB Network: 1 GB/s

Deployment Profiles

Small Deployment

vCloud Automation Center

Supports

- 1,000 managed machines
- 2,500 catalog items
- 10 concurrent deployments

NOTE: All host names used in this document are for illustration purposes only.

Identity Virtual Appliance (small-sso.ra.local)

vCloud Automation Center Virtual Appliance (small-vcacva.ra.local)

Infrastructure Core Server (small-Infrastructure.ra.local)

> Configure this server with a minimum of 2 processors and 8 GB of memory. A smaller configuration can lead to out-of-memory exceptions and timeouts.

MSSQL Database Server (small-mssql.ra.local)

vCloud Application Director

vCloud Application Director Server (small-appd.ra.local)

Supports up to 10 concurrent deployments. Each deployment has approximately 3 to 14 VM nodes.

IT Business Management

IT Business Management Server (small-itbm.ra.local)

Supports up to 20,000 VMs.

Requires IT Business Management Virtual Appliance.

Certificates

NOTE: All host names used in this document are for illustration purposes only.

SERVER ROLE	CN / SAN
vCloud Automation Center	
Identity Virtual Appliance (VA)	CN = small-sso.ra.local
vCloud Automation Center Virtual Appliance (VA)	CN = small-vcacva.ra.local
Infrastructure Core Server	CN = small-Infrastructure.ra.local
MSSQL Database Server	N/A
vCloud Application Director	
vCloud Application Director Server	CN=small-appd-.ra.local
IT Business Management	
IT Business Management Server	CN = small-itbm.ra.local

Ports

Users require access to the ports in the following table.

SERVER ROLE	PORT
vCloud Automation Center	
Identity Virtual Appliance	7444
vCloud Automation Center Virtual Appliance (VA)	443

Infrastructure Core Server	443
vCloud Application Director	
vCloud Application Director Server	8443

Administrators require access to the same ports as users, and to the ports in the following table.

SERVER ROLE	PORT
vCloud Automation Center	
Identity Virtual Appliance	5480
vCloud Application Director	
vCloud Application Director Server	
IT Business Management	
IT Business Management Server	5480

SERVER ROLE	INBOUND PORTS	SERVICE/SYSTEM: OUTBOUND PORTS
vCloud Automation Center		
Identity Virtual Appliance (VA)	7444 SSH: 22 VAMI: 5480	LDAP: 389 LDAPS: 636
vCloud Automation Center Virtual Appliance (VA)	443 SSH: 22 VAMI: 5480	Identity VA: 7444
Infrastructure Core Server	443	MSSQL: 1433
MSSQL Database Server	1433	Not applicable
vCloud Application Director	These ports should not be changed or blocked.	
vCloud Application Director Server	8443 HTTPS User Interface connection 8080 HTTP (legacy port; do not use)	
vFabric RabbitMQ	5671 AMQP over SSL	
External SSH connection	22	
Content Server	80 HTTP (used to host OOB	

	content, agent binary, and CLI binary)	
IT Business Management		
IT Business Management Server		
IT Business Management UI connection	443 HTTPS	
External SSH connection	22	
Web console access (VAMI)	5480	

Diagrams

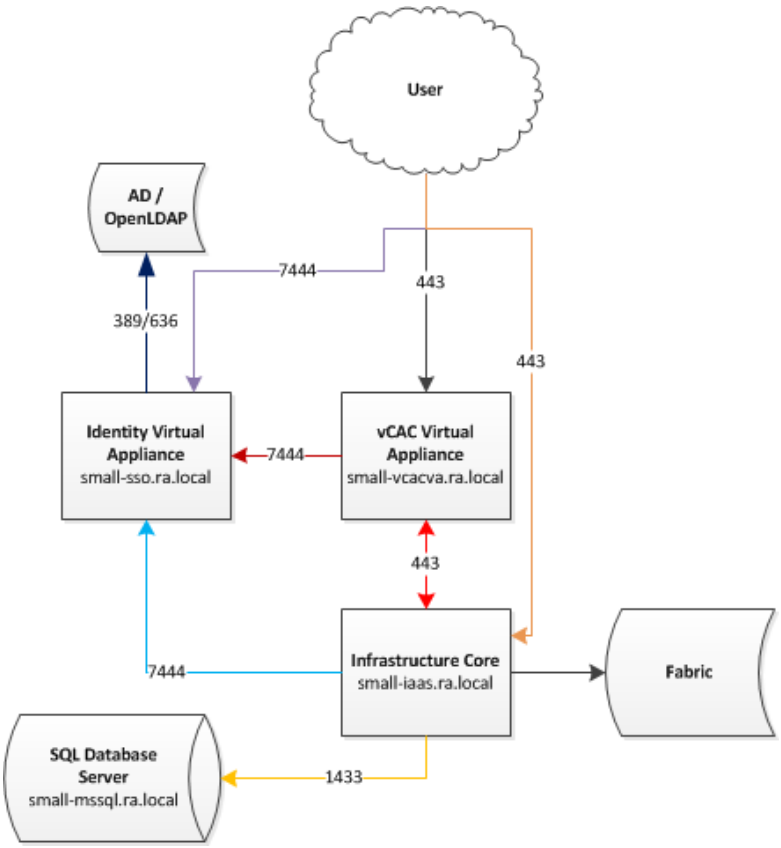

Figure 1a. Minimum Footprint for Small Configuration (vCloud Automation Center)

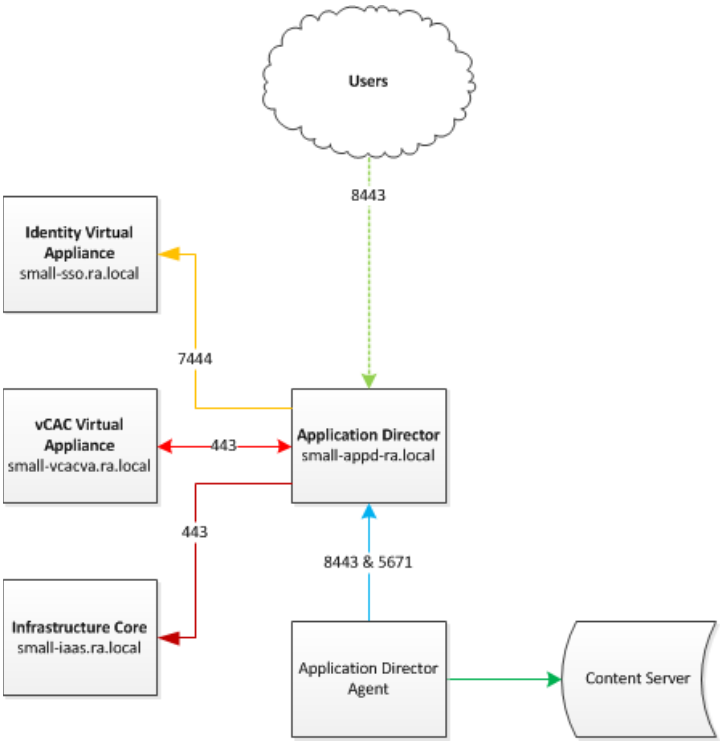

Figure 1b. Minimum Footprint for Small Configuration (vCloud Application Director)

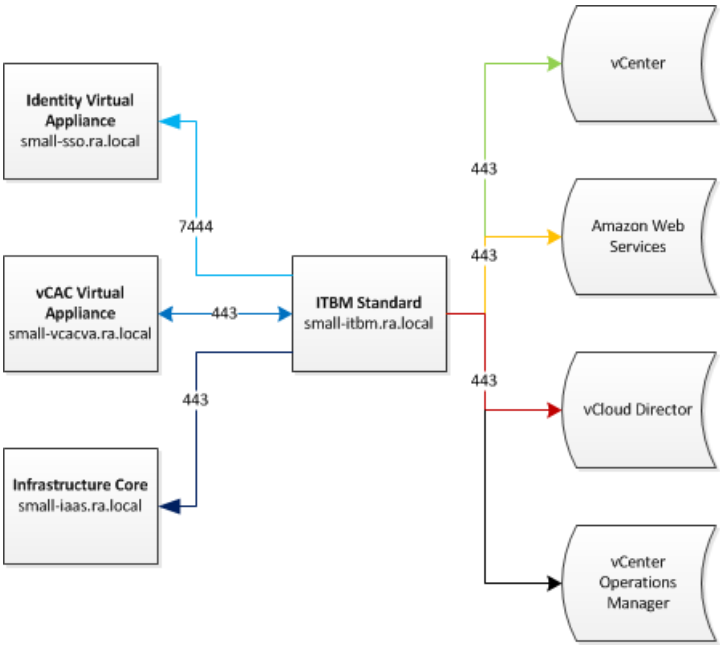

Figure 1c. Minimum Footprint for Small Configuration (IT Business Management)

Medium Deployment

vCloud Automation Center

Supports

- 10,000 Managed Machines
- 2,500 Catalog Items
- 50 Concurrent Deployments

Virtual Appliances

- Identity Virtual Appliance (med-sso.ra.local)
- vPostgres Virtual Appliance (med-psql.ra.local)
- vCloud Automation Center Virtual Appliance 1 (med-vcacva-1.ra.local)
- vCloud Automation Center Virtual Appliance 2 (med-vcacva-2.ra.local)

Windows Server Virtual Machines

- Infrastructure Web/Manager Server 1 (Active Web/DEM-O, Active Manager) (med-webman-1.ra.local)
- Infrastructure Web/Manager Server 2 (Active Web/DEM-O, Passive Manager) (med-webman-2.ra.local)
- Infrastructure DEM Server 1 (med-dem-1.ra.local)
- Infrastructure DEM Server 2 (med-dem-2.ra.local)
- Infrastructure Agent Server 1 (med-agent-1.ra.local)
- Infrastructure Agent Server 2 (med-agent-2.ra.local)
- Clustered MSSQL Database (med-mssql.ra.local)

Load Balancers

- vCloud Automation Center VA Load Balancer (med-vcacva.ra.local)
- Infrastructure Web Load Balancer (med-web.ra.local)
- Infrastructure Manager Service Load Balancer (med-manager.ra.local)

vCloud Application Director

vCloud Application Director Server (med-appd.ra.local)

Supports up to 20 concurrent deployments. Each deployment has approximately 3 to 14 VM nodes.

IT Business Management

IT Business Management Server (med-itbm.ra.local)

Supports up to 20,000 VMs.

Requires IT Business Management Virtual Appliance.

Certificates

NOTE: All host names used in this document are for illustration purposes only.

SERVER ROLE	CN/SAN
vCloud Automation Center	

Identity Virtual Appliance (VA)	CN=med-sso.ra.local
vCloud Automation Center Virtual Appliance (VA)	SAN contains med-vcacva.ra.local med-vcacva-1.ra.local med-vcacva-2.ra.local
Infrastructure Web/Manager Server	SAN contains med-web.ra.local med-manager.ra.local med-webman-1.ra.local med-webman-2.ra.local
Infrastructure DEM Server	N/A
Infrastructure Agent Server	N/A
vPostgres Virtual Appliance	N/A
MSSQL Database Server	N/A
vCloud Application Director	
vCloud Application Director Server	CN=med-appd.ra.local
IT Business Management	
IT Business Management Server	CN=med-itbm.ra.local

Ports

Users require access to the ports in the following table.

SERVER ROLE	PORT
vCloud Automation Center	
Identity Virtual Appliance	7444
vCloud Automation Center Virtual Appliance Load Balancer	443
vCloud Automation Center Infrastructure Web Load Balancer	443
vCloud Application Director	
vCloud Application Director Server	8443

Administrators require access to the same ports as users, and to the ports in the following table.

SERVER ROLE	PORT
vCloud Automation Center	

Identity Virtual Appliance	5480
vCloud Application Director	
vCloud Application Director Server	
IT Business Management	
IT Business Management Server	5480

SERVER ROLE	INBOUND PORTS	SERVICE/SYSTEM: OUTBOUND PORTS
vCloud Automation Center		
Identity Virtual Appliance (VA)	7444	LDAP: 389 LDAPS: 636
vCloud Automation Center Virtual Appliance (VA)	443	Identity VA: 7444 vPostgres Virtual Appliance: 5432 vCloud Automation Center Infrastructure Web Load Balancer: 443 vCloud Orchestrator Systems: 8281
Infrastructure Web/Manager Server	443	MSSQL: 1433 vCloud Automation Center Infrastructure Web Load Balancer: 443
Infrastructure DEM Server	Not applicable	Identity VA: 7444 vCloud Automation Center Virtual Appliance Load Balancer: 443 vCloud Automation Center Infrastructure Web Load Balancer: 443 vCloud Automation Center Infrastructure Manager Load Balancer: 443
Infrastructure Agent Server	Not applicable	vCloud Automation Center Infrastructure Web Load Balancer: 443 vCloud Automation Center Infrastructure Manager Load Balancer: 443
vPostgres Virtual Appliance	5432	Not applicable
MSSQL Database Server	1433	Not applicable

vCloud Application Director	These ports should not be changed or blocked.	
vCloud Application Director Server	8443 HTTPS User Interface connection 8080 HTTP (legacy port; do not use)	
vFabric RabbitMQ	5671 AMQP over SSL	
External SSH connection	22	22
E Content Server	80 HTTP (used to host OOB content, agent binary, and CLI binary)	
IT Business Management		
IT Business Management Server		
IT Business Management UI connection	443 HTTPS	
External SSH connection	22	
Web console access (VAMI)	5480	

LOAD BALANCER	PORTS BALANCED
vCloud Automation Center Virtual Appliance Load Balancer	443
vCloud Automation Center Infrastructure Web Load Balancer	443
vCloud Automation Center Infrastructure Manager Service Load Balancer	443

Diagrams

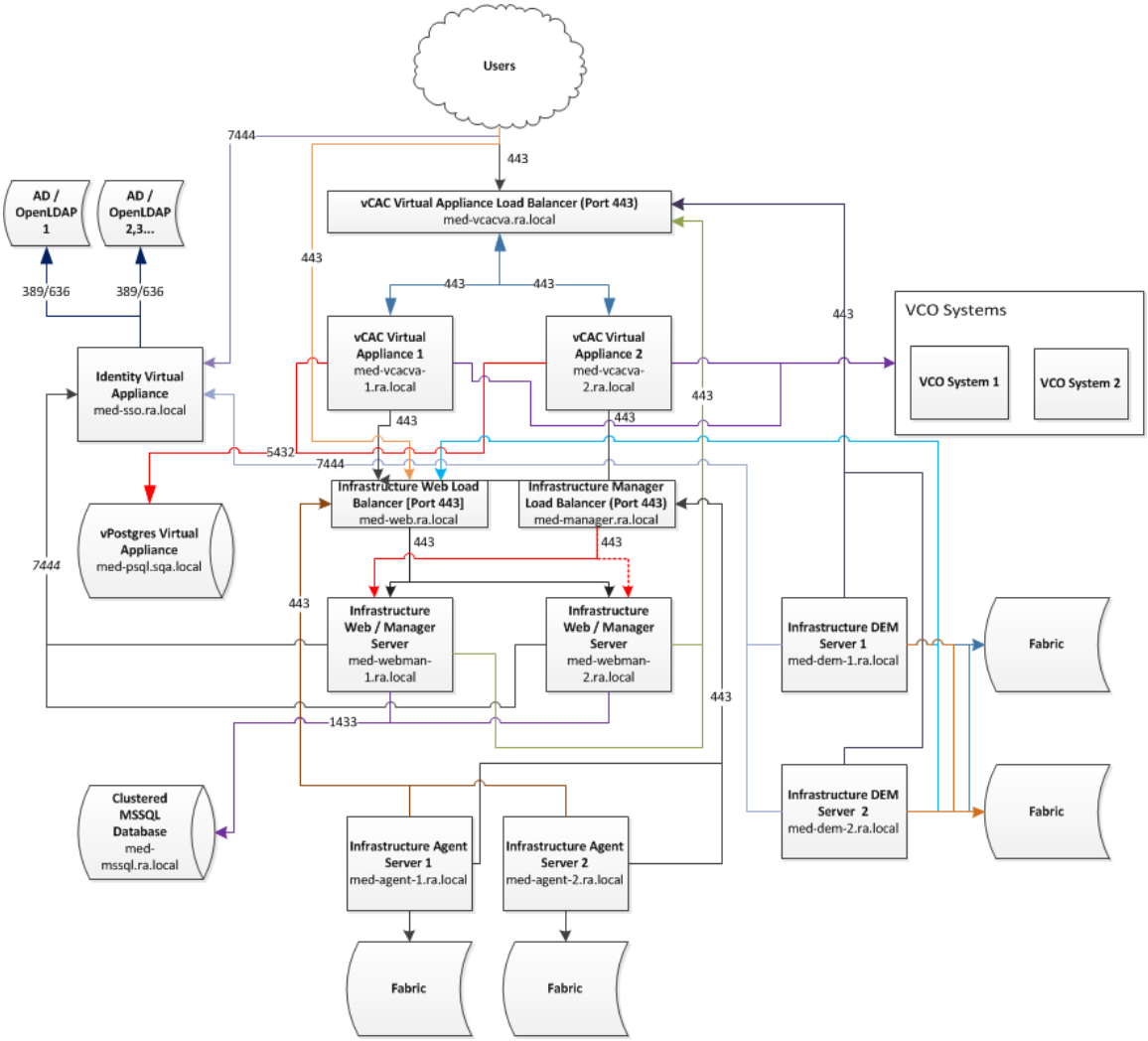

Figure 2a. Minimum Footprint for Medium Configuration (vCloud Automation Center)

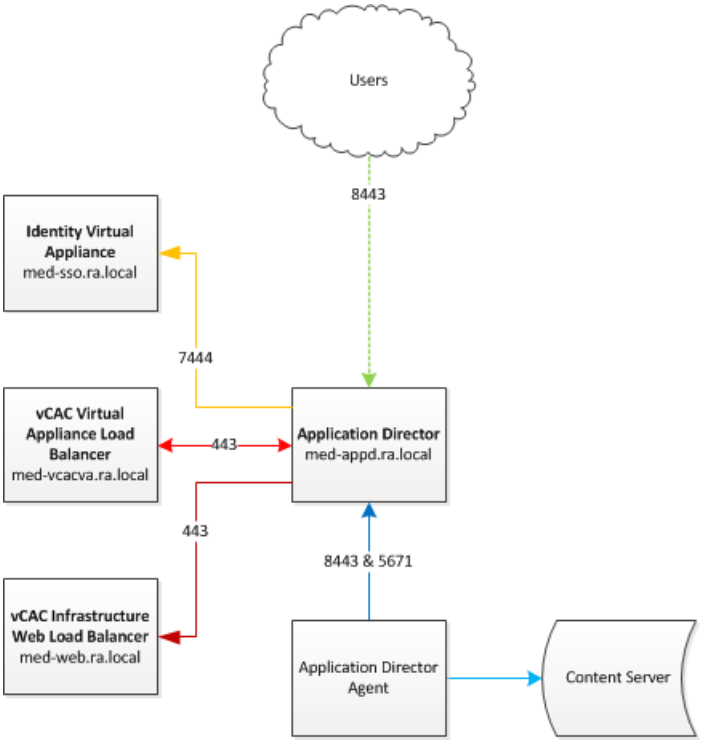

Figure 2b. Minimum Footprint for Medium Configuration (vCloud Application Director)

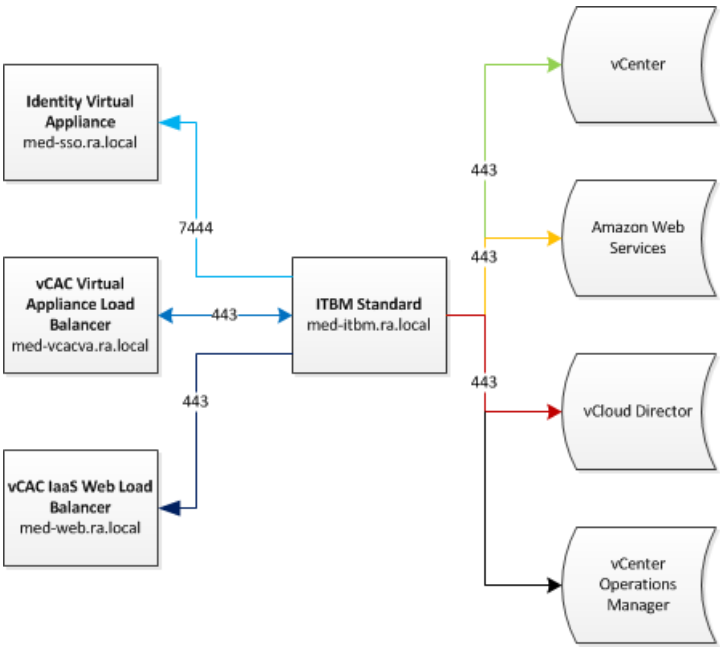

Figure 2c. Minimum Footprint for Medium Configuration (IT Business Management)

Large Deployment

vCloud Automation Center

Supports

- 50,000 Managed Machines
- 2,500 Catalog Items
- 100 Concurrent Deployments

Virtual Appliances

- Identity Virtual Appliance (lg-sso.ra.local)
- vPostgres Virtual Appliance (lg-psql.ra.local)
- vCloud Automation Center Virtual Appliance 1 (lg-vcacva-1.ra.local)
- vCloud Automation Center Virtual Appliance 2 (lg-vcacva-2.ra.local)

Windows Server Virtual Machines

- Infrastructure Web Server 1 (lg-web-1.ra.local)
- Infrastructure Web Server 2 (lg-web-2.ra.local)
- Infrastructure Manager Server 1 (lg-manager-1.ra.local)
- Infrastructure Manager Server 2 (lg-manager-2.ra.local)
- Infrastructure DEM Server 1 (lg-dem-1.ra.local)
- Infrastructure DEM Server 2 (lg-dem-2.ra.local)
- Infrastructure Agent Server 1 (lg-agent-1.ra.local)
- Infrastructure Agent Server 2 (lg-agent-2.ra.local)
- Clustered MSSQL Database Server (lg-mssql.ra.local)

Load Balancers

- vCloud Automation Center VA Load Balancer (lg-vcacva.ra.local)
- Infrastructure Web Load Balancer (lg-web.ra.local)
- Infrastructure Manager Server Load Balancer (lg-manager.ra.local)

vCloud Application Director

vCloud Application Director Server (lg-appd.ra.local)

Supports up to 40 concurrent deployments. Each deployment has approximately 3 to 14 VM nodes.

IT Business Management

IT Business Management Server (lg-itbm.ra.local)

Supports up to 20,000 VMs.

Requires IT Business Management Virtual Appliance.

Certificates

NOTE: All host names used in this document are for illustration purposes only.

SERVER ROLE	CN/SAN

vCloud Automation Center	
Identity Virtual Appliance (VA)	CN=lg-sso.ra.local
vCloud Automation Center Virtual Appliance (VA)	SAN contains lg-vcacva.ra.local lg-vcacva-1.ra.local lg-vcacva-2.ra.local
Infrastructure Web Server	SAN contains lg -web.ra.local lg -web-1.ra.local lg -web-2.ra.local
Infrastructure Manager Server	SAN contains lg-manager.ra.local lg-manager-1.ra.local lg-manager-2.ra.local
Infrastructure DEM Server	N/A
Infrastructure Agent Server	N/A
vPostgres Virtual Appliance	N/A
MSSQL Database Server	N/A
vCloud Application Director	
vCloud Application Director Server	CN=lg-appd.ra.local
IT Business Management	
IT Business Management Server	CN=lg-itbm.ra.local

Ports

Users require access to the ports in the following table.

SERVER ROLE	PORT
vCloud Automation Center	
Identity Virtual Appliance	7444
vCloud Automation Center Virtual Appliance Load Balancer	443
vCloud Automation Center Infrastructure Web Load Balancer	443
vCloud Application Director	
vCloud Application Director Server	8443

Administrators require access to the same ports as users, and to the ports in the following table.

SERVER ROLE	PORT
vCloud Automation Center	
Identity Virtual Appliance	5480
vCloud Application Director	
vCloud Application Director Server	
IT Business Management	
IT Business Management Server	5480

SERVER ROLE	INBOUND PORTS	SERVICE/SYSTEM: OUTBOUND PORTS
vCloud Automation Center		
Identity Virtual Appliance (VA)	7444	LDAP: 389 LDAPS: 636
vCloud Automation Center Virtual Appliance (VA)	443	Identity VA: 7444 vPostgres Virtual Appliance: 5432 vCloud Automation Center Infrastructure Web Load Balancer: 443 vCloud Orchestrator Systems: 8281
Infrastructure Web Server	443	MSSQL: 1433
Infrastructure Manager Server	443	vCloud Automation Center Infrastructure Web Load Balancer: 443 MSSQL: 1433
Infrastructure DEM Server	Not applicable	Identity VA: 7444 vCloud Automation Center Virtual Appliance Load Balancer: 443 vCloud Automation Center Infrastructure Web Load Balancer: 443 vCloud Automation Center Infrastructure Manager Load Balancer: 443
Infrastructure Agent Server	Not applicable	vCloud Automation Center Infrastructure Web Load Balancer: 443 vCloud Automation Center Infrastructure Manager Load Balancer: 443
vPostgres Virtual Appliance	5432	Not applicable

MSSQL Database Server	1433	Not applicable
vCloud Application Director	These ports should not be changed or blocked.	
vCloud Application Director Server	8443 HTTPS User Interface connection 8080 HTTP (legacy port; do not use)	
vFabric RabbitMQ	5671 AMQP over SSL	
External SSH connection	22	
Content Server	80 HTTP (used to host OOB content, agent binary, and CLI binary)	
IT Business Management		
IT Business Management Server		
IT Business Management UI connection	443 HTTPS	
External SSH connection	22	
Web console access (VAMI)	5480	

LOAD BALANCER	PORTS BALANCED
vCloud Automation Center Virtual Appliance Load Balancer	443
vCloud Automation Center Infrastructure Web Load Balancer	443
vCloud Automation Center Infrastructure Manager Service Load Balancer	443

Diagrams

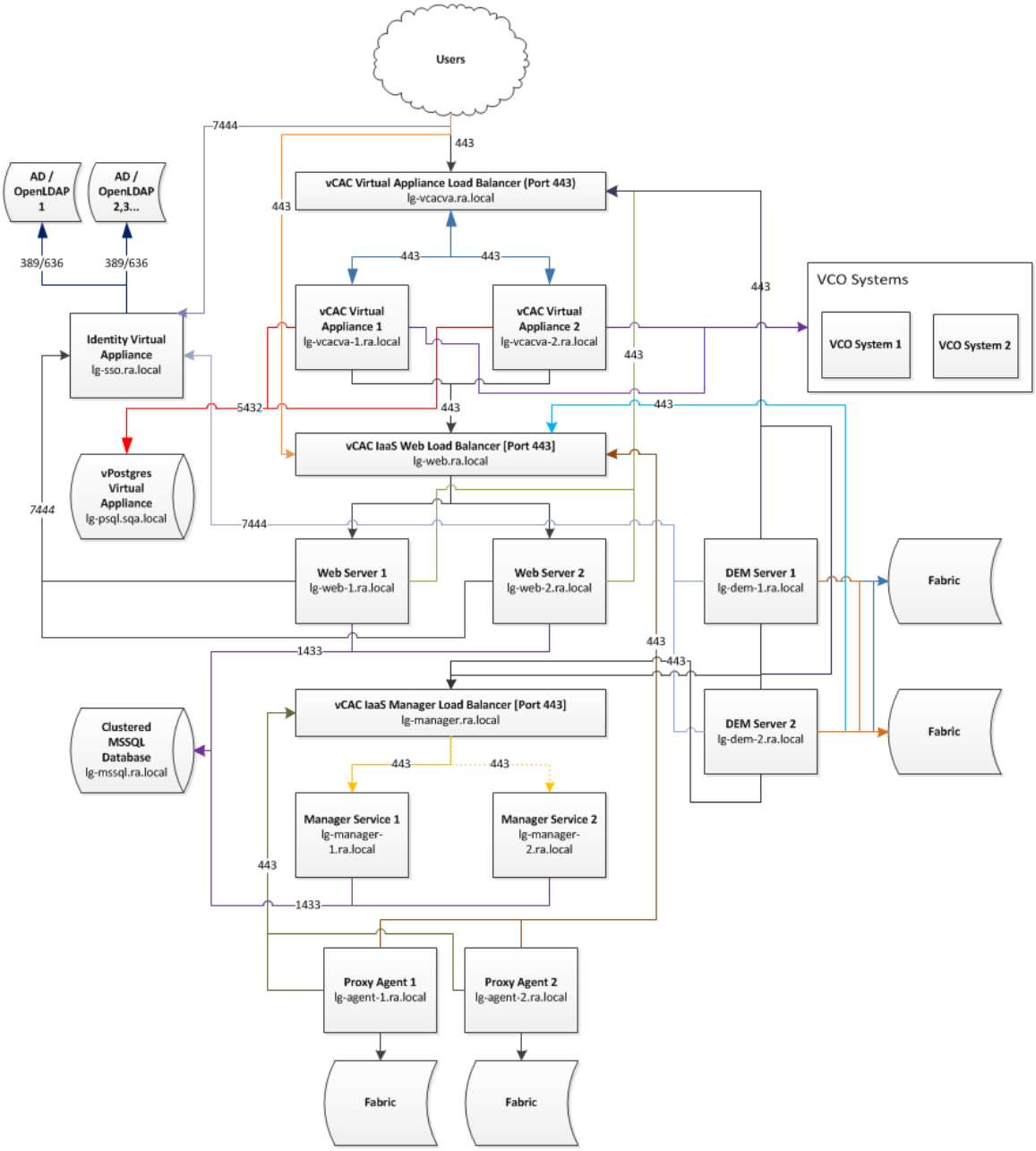

Figure 3. Minimum Footprint for Large Configuration (vCloud Automation Center)

For a minimum footprint of the large configuration of vCloud Application Director or IT Business Management, see the corresponding medium configuration in Diagrams on page 20. The medium and large configurations for these products are identical.

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